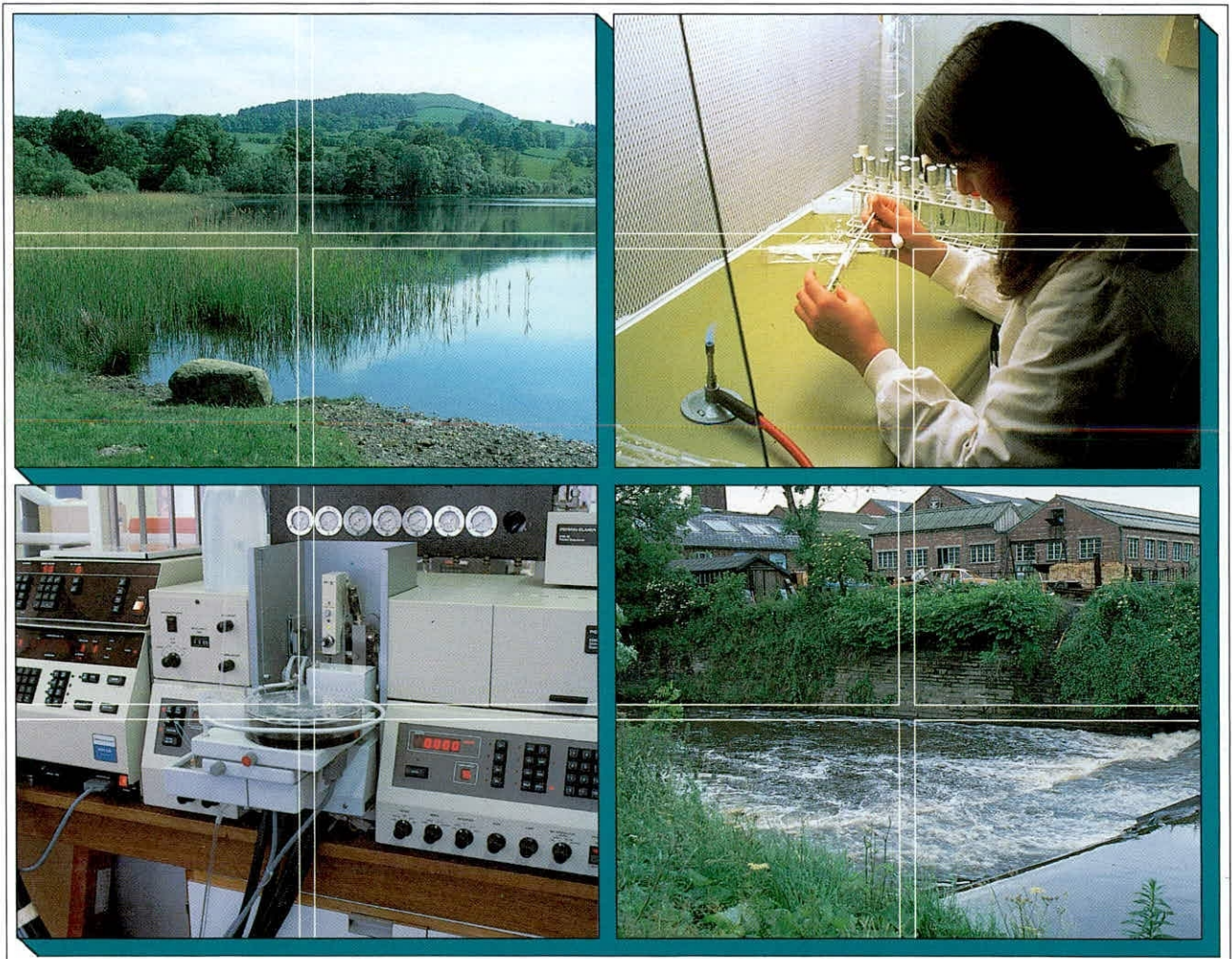


A meeting on

The future of EC R&D and industrial policy



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A meeting on
The future of EC R&D and industrial policy

Project leader: F.H. Dawson, PhD, MIWEM, CBiol, FIBiol,
IFE Internal Marketing Coordinator
Report date: July 1993
Report to: Dr. D. Coates, TFSD Marketing Manager
Contract No: Telephone call with D. Coates
IFE Report Ref: RL/T95313c2/1
TFS Project No: T95313c2

This is an unpublished report and should not be cited without permission, which should be sought through the Director of the Institute of Freshwater Ecology in the first instance.

The Institute of Freshwater Ecology is part of the Terrestrial and Freshwater Sciences Directorate of the Natural Environment Research Council.

SUMMARY

Much emphasis was given to industrial R&D with only token mentions of environment. However, despite this, many general points were made of great relevance to all proposals to the EC. A wide range of views were expressed in presentations by administrators from the EC, an MEP and one large and some SMEs (small & medium enterprises) industrial firms.

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 - 2.1.2 Allan Mayo, OST
 - 2.2 EC Industrial Policy
Michael Catinat DG III Information technologies
 - 2.3 R&D and Industrial Competivity
Madron Seligman MEP
 - 2.4 Technology Policy
Diana Rowen, European Policy Forum
 - 2.5 Case Studies
 - 2.5.1 Competitiveness and pre-Competitiveness in Industrial Policy
 - 2.5.2 Experiences of participating in EC R&D
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APPENDICES

- I The fourth framework programme - Implications for Collaborative Research
- II Second working document on RTD Policy and fourth framework programme 94-98 of Community RTD Activities, 22 April 1993
- III Recherche CEC Press Releases, 29 April 1993
- IV EC Industrial Policy - elements for market-based and proactive approach, M. Catinat
- V The internal market for electricity and gas (not presented but circulated)
- VI Technology policy and EC competitiveness, Diana Rowen April 1993
- VII Case Study 2 Experiences in participation in EC R&D Programmes Dr B. Isherwood
- VIII Speakers biographies
- IX Participants list
- X dti Information Pack inc. acronyms and guide to each programme with contacts including ESPRIT, new EC Environment, Biotech groups, COST, EUREKA.

THE FUTURE OF EC R&D AND INDUSTRIAL POLICY CONFERENCE

Tuesday, 6 July 1993 - Cavendish Conference Centre, London

T I M E T A B L E

MORNING

- 9.45 Chairman's introduction - Adrian Grilli, DTI
- 10.00 The 4th Framework Programme - Implications for Collaborative Research
Dr Nicholas Hartley, DXII, BRITE/EURAM, CEC, Brussels
and
Allan Mayo, Co-ordinator UK Policy on EC R&D, Office of Science and Technology, Cabinet Office
- 11.15 COFFEE
- 11.45 EC Industrial Policy - Elements for a Market-based and Pro-active Approach
Michel Catinat, Head of Unit for Information Technologies, Analysis and Strategy, DGIII, CEC, Brussels
- 12.30 R&D and Industrial Competitivity
Madron Seligman, MEP, Spokesman for the Energy, Research & Technology Committee, European Parliament
- 1.00 LUNCH

AFTERNOON

- 2.15 Technology Policy & EC Competitiveness - A summary of a report
Diana Rowen, European Policy Forum
- 2.45 Case Study 1 - Competitiveness and pre-competitiveness in Industrial Policy
Dirk Hudig, Manager EC Relations, ICI, Brussels
- 3.15 TEA
- 3.45 Case study 2 - Experience of Participating in EC R&D Programmes
Dr Brian Isherwood, Hirst Research Centre, GEC Marconi Ltd
- 4.15 Case study 3 - An SME view
Ian Catling, Director, Catling Consultancy
- 4.45 Discussion
- 5.15 Close of Conference

2. The presentation - notes

The future of EC R&D and Industrial Policy. Organised by IETT, 6 July 1993, London

2.1 Fourth Framework Programme

2.1.1 Fourth Framework Programme - Implications for Collaborative Research
Dr Nicholas Hartley DG XII (BRITE/EURAM Programme)
(overheads see Appendix 1).

Key points:

'Attach funding not by cash but by philosophy.'

- Research and Development now to Research and Technological Development
- Collaboration always needed.
- Transparency.
- Framework rapidly increased over decade esp. since 1986 when single European Act; currently more money but wider base.
- Framework IV now strategic R&D. It is divided as:

First Activity	83%	to RTD and Demonstration Programmes
Second	6%	Cooperation with 3rd and international organisations
Third	5%	dissemination and application of results
Fourth	6%	stimulation of training and marketing of researchers includes Human Capital and Mobility, COMET, DELTA

These changes are to ensure that there is increased emphasis on:

1. Competitibility
2. Relevant to EC and
3. Relevant to societies needs

This is to be achieved through policy changes in

1. Integration (a) reciprocity between national and European level, i.e. what is added value of operating at the community level?
(b) megaprojects eg global change, human genome
(c) creation of European Research Area, eg CERN (Why have these been separate for so long?)
2. Economic impact - need to reflect.
Closer but wider links with RTD across EC countries.
Focus on **generic** technologies - becoming more selective, and support for specific industries, eg transport
AND Pre-normative (then prelegislative) research
3. Dissemination and exploitation - 307 projects have been examined and lessons learnt and changes being implemented.
 - small SMEs
 - relevant training - 'not just travelling PhDs'
 - relevance and synergy

3. Flexibility - to increase, response to market and to new scientific and technological changes
- increase in rapidity of procedures for proposals and for decision making

Recent Documentation and its changes

- Charges note - The phraseology is now Working document for Framework
- the addition of Technological to R&D now 'RTD policy in the community' and
 - demonstration of projects not just at research level
 - Second working document (heads of state talking about RTD)
 - three annexes use 'indicative' with funding levels and address all levels not just good science

Science and Technological Objectives

First Activity allocation is 11 B ECU - generally more selective with 54 previous core areas reduced to 28 (see annex 11 for items 1-7.)

WHEN MAKING PROPOSALS

- Check underlying EC requirement for all projects
- Think 'what can you put into Europe, rather than vice versa'

2.1.2 Framework IV, Allan Mayo economist

Comments:

- Programme needs to be agreed before May 1993
- EP opinion by November - draft programmes for autumn 1993, and
- then needs to be agreed in principle with EP (by next election)
- money then from 1995 (1995-98) none for 1994 for R&D but there could be however UK suggested 1995-9 for funding window
- Programme size - steady increase in EC R&D to end of decade could be 13 B ECU (= 13 G ECU)
- UK is getting more than 'just return' ie more than the 16% given;
- poorest area is non nuclear, much emphasis on IT and telecoms
- only 40 of top 100 companies participated in Framework programmes
- Rebalancing is occurring over successive Framework programmes towards industrial technologies and materials and life sciences areas with final levels for IT and telecoms 30 or 25% possible range of agreement and Life sciences 13-15% Environment 8-10% Energy 15-18%
- UK thinks
- 83% is low as real element of doubt lies in dissemination and exploitation must be raised although synergism with EC could also be included (check Relay, Sprint)
- Joint Research Centre also activity should come from individual directorates eg in

agricultural fraud (but scope for proposals in this area esp. remote sensing, ie either under Framework or directly to Directorates training (Human Capital and Mobility) within programmes not as a separate area (- UK only attitude) except for areas not covered within Framework

- Mechanism of implementation of programme important. 80% in share cost contracts but little contact outside consortia, must be improved, eg in industrial projects 70% of less than 5 members. Better networks of research, cp to few share cost contact members.

JRC costs 1 BECU (= 800 m over 4 years) proposed but UK questions this support.

(<500 employees)

SMEs	large corporations	Education	Research Institutes
30%	28%	22%	14% - higher

- less SMEs (small and medium sized enterprises) participation in marine sciences

SMEs involvement is welcomed in programme, could have advantages

More SMEs participate in EUREKA than Framework.

Questions to speaker:-

- Top up funding for 1994 900 MECU proposed.

- Under APAS, research funded outside Framework Programme will be increased but no figures.

- IMS (collaboration with Japanese). International cooperation will continue following successful feasibility studies

- 90% to CIS and Eastern European countries (5% of overall spend)

(- 4M ECU Research Councils and Royal Society)

- Univ. Enterprise Training Programme funded from COMET, uses could improve if successful, especially if absorbing technology.

- Demonstration-valorisation programmes should form part of programmes (UK view), ie as THERMIE to ENERGY but uncertain of ENVIRONMENT and LIFE.

COMMISSION OF THE EUROPEAN COMMUNITIES

COM(93) 158 final

Brussels, 22 April 1993

Extracted from - in full in Appendix

SECOND COMMISSION WORKING DOCUMENT CONCERNING RTD POLICY IN THE COMMUNITY AND THE FOURTH FRAMEWORK PROGRAMME (1994-98) OF COMMUNITY RTD ACTIVITIES

Environment

The guidelines for research, particularly environmental research, reflect the need to expand the scientific and technical basis with a view to ensuring throughout the Community a harmonious and balanced development of economic activities, and sustainable and non-inflationary growth respecting the environment.

Consequently, the Community's research and technological development activities must support policy formulation and implementation in the many different fields covered by this objective. The Community's Fifth Action Programme on the Environment set the primary objective of moving towards sustainable development. Against this background, it set out a new strategy for addressing, on the basis of the sharing of responsibilities, activities which affect natural resources or damage the environment instead of waiting for problems to arise. The aim of the strategy is to alter trends and practices which are harmful to the environment in order to improve the quality of life and the socio-economic development of the present generation and of future generations by increasing the range of instruments for changing the behaviour of those concerned. In addition, the programme specifically addresses several priority problems and hazards which affect the Community as a whole and which must be resolved. They include climate change, acidification and quality of the air, protection of natural resources and biodiversity, water-resource management, the urban environment, coastal regions, waste treatment, industrial hazards, civil protection and urban disasters. To assess and manage complex environmental problems such as these a multidisciplinary approach is called for. A new approach is therefore appropriate, fully reflecting the political guidelines but also flexible enough to encourage interactions and allow proper attention to be paid to each specific field such as marine science and technology (including polar research) or climatology.

The two research areas are therefore as follows:

- Natural Environment, Environmental Quality and Global Change; and
- Innovative Environmental Protection Technologies.

The first area concerns the fundamental characteristics and processes governing the natural environment, including land, oceans and air, and how they are affected by human behaviour. Research on these subjects would be ideally suited for an integrated approach enabling the Community to make a major contribution to the worldwide action on global change. This applies in particular to modelling. Generally, Europe is expected to play a growing role in Earth observation activities. The Community must step up its action in this field, in conjunction with the space agencies. This is a typical example of a field in which the Joint Research Centre could make a significant contribution.

The second area covers the development of prevention, assessment, detection, environmental protection and restoration technologies. In this case, links will be established with EUREKA to ensure that the results of this environmental research yield their full potential in terms of the development of technologies and innovatory markets for European industry.

Core themes 19-22 proposed in the first working document plus the environmental technology aspects of core themes 16 (Urban Habitat), 17 (European Cultural Heritage) and 18 (Social Exclusion) will therefore be condensed into two areas.

Life Sciences and Technologies

The activities relating to life sciences and technologies are crucial for the future of the Community, this being a rapidly expanding field which is vital for the relevant common policies.

The benefits which they can bring for man and society are a priority in their own right. The Member States' capacities in this field vary widely, but many of them can rely on an internationally recognized scientific and technical base. Consequently, the Community must concentrate on themes which cannot be covered at other levels but in which the Community must hold its own against fierce international competition. Examples include the recent advances in molecular biology and determination of the genetic heritage.

Strong basic technological research is needed to offer a wide range of methods of tackling very different research problems. The aim of this integration activity will be to provide the infrastructure for combining the efforts of the many institutes involved, in interaction with the existing industrial focal points. The priorities for action by the Community include development of genome sequencing processes which are ideally suited for the establishment of European cooperation networks. An integrated European consortium could also be set up to bolster the Community's position in the field of molecular phylogenetics.

The arguments for greater investment in research into biomedicine and health are primarily of a social and economic nature. Rising costs in this field have become a major concern for every country, even the richest. At the same time, citizens in every Member State are demanding high-quality health-care. The wide diversity of public-health systems, and of causes of mortality and morbidity, in Europe, is an asset which must be tapped. Comparative epidemiology and research into the health services will provide a means of harnessing this diversity as a source of numerous research hypotheses. This approach will contribute to the prevention of major diseases such as cancer, cardiovascular disease, infectious diseases such as AIDS, neurological and mental illnesses and age-related or diet-related pathology.

Particular attention will be paid to the development of the scientific basis and the techniques necessary to evaluate new drugs for the treatment of neurological, psychiatric and immunological disorders and to participation in the Brain Decade, notably by the development of methodology, instrumentation and specialised infrastructure which are necessary for the study of the nervous system.

Primary production, whether from agriculture, horticulture, fisheries or forestry, supplies the raw materials to meet food and other needs. The reform of the common policies entails considerable changes. Research concerning agriculture, forestry, rural development, fisheries and aquaculture must *reflect these changes and address methods, techniques, production systems and products.*

Agro-industrial research must keep ahead of this trend and focus on methods of processing biological raw materials and increasing their added value while ensuring the safety of foodstuffs. It will provide feedstocks for fine chemistry, food ingredients and cosmetic and medicinal substances. Biotechnology in turn will underpin the development of this activity, interacting closely with other technologies such as information technology and chemical engineering.

The activities will therefore be divided into three areas:

- General Biotechnology;
- Biomedicine, Health and Drugs;
- Application of Life Sciences and Technologies in Agriculture, Forestry, Rural Development, Agro-industry and Fisheries.

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The activities will therefore be divided into three areas:

2.2 EC Industrial Policy Michael Catinat, Head, Unit of Information Technologies DG III)

Elements for market based and proactive approach (presentation in full in Appendix IV)

Industrial policy in an open and competitive environment. Which policy should be adopted by the EC?

Those in which the underlying principles are

- coherence
- positive adjustment
- EC is catalyst only
- improvement of market

and by changes to Instruments which are

- no longer useful, eg restrictions, bilateral agreements
- remaining useful, eg regional aid, standardisation
- needing enhancement, eg professional training, established property rights, international agreements

BUT the factors, and then interaction, are complex, changes need monitoring upstream and redirect

Example given from Industrial policy for telecommunications in Europe.

2.3 R&D and Industrial Competitiveness Madron Seligman MEP

Points discussed

- unemployment most important current problem. (17 M in EC)
- 'science today - jobs tomorrow'
- does science create or destroy jobs?
- skill levels have increased but basic labour wages ratio currently £100 UK £12 Poland, £1.50 in China equivalent payments; therefore EC cannot compete successfully at that level
- objective high technology and big science in EC, but USA and Japan exploit much, what is EC response to be? Thus selective choice of projects and share between European countries.
- Industry not loud enough in emphasising joint R&D but UK gets greater pro rata proportion of R&D (!)
- raise R&D from 2% of GDP (cp USA 4 times this)
- problem of non-competitive level (or generic) research, ie lack of continuity, ie a gulf between EC and national (which Eureka should fill) but changes are due.

Examples from competing IT and Telecom. Computing mainly lost but software remains in EC. Telematics, eg DRIVE for traffic, AIM for remote diagnosis, LIFE for medical disease, Biotechnology and transgenic biota.

Pharmaceutical industry is the only industry to equate in size with USA in terms of R&D.

- The problem that small and medium companies (SMEs) receive only 17% for R&D (cp ~ 42% in large companies) mainly due to lack of capital for development.

Much awaits the ratification of the 'Maastricht' Treaty.

Sources of data for industry and EC are DTi, Chamber of Commerce, Trade Association, County Councils

Questions

What is a European company - IBM has convinced EC that it is, as EC requires 1 plant or 1 research laboratory in Europe (cp USA) but EC is asking for reciprocity from non EC, eg Sematic in US.

- Discussion of simplified documentation for proposals

2.4 EC Biotechnology Policy Diana Rowen, Research Fellow, European Policy Forum

Controversial points included:

- Has EC funds been substituted for commercial funding?
 - Basic)
 - Exploratory) 66% not done without EC funding

 - Application)
 - Near market R&D) 66% done with EC funds but would have been undertaken anyway
- EC funding is only 4% of all UK R&D
- Intellectual property rights issue still remain with consortia
- EC seems to encourage larger projects therefore appropriate size of projects
- What makes a good project - is it an overall 20% return to UK? (!)

The Institute of European Trade and Technology 5 July 1993

EC TECHNOLOGY POLICY

Diana Rowen, European Policy Forum

The Case for Subsidy

- ▶ Back to the basics.
- ▶ The difficulty of "appropriating" the results of R&D.
- ▶ The R&D spectrum from basic to near-market results and the result of the PREST/SPRU survey of Framework projects in the UK.
- ▶ Public funds substituting for private investment?

Dissemination and Disincentives

- ▶ Policies that work at cross purposes.
- ▶ Intellectual property rights in the Framework Programme.
- ▶ Cumbersome cooperative ventures: European cohesion at the expense of good R&D?
- ▶ Sharing scientists and engineers.

Setting Technology Standards

- ▶ Technology standards as a tool of competition policy.
- ▶ The danger of slowing or freezing the pace of innovation.
- ▶ Guidelines for efficient and effective technology standards.
- ▶ Look beyond the Framework programme to how EC regulations shape industry investment.

2.5 Case Studies

2.5.1 Case Study 1 - Competitiveness and precompetitiveness in Industrial Policy Dirk Hudgig, Manager EC Relations, ICI Brussels

From a company point of view, ICI, in which £720M is R&D but includes technical services, largest in UK, 2.5% of sales, 5,000 research staff, all research is decentralised

- Reticence includes
- why go to EC if research will be funded anyway, certainly not for money, but
- (1) for gearing (ie multipliers) especially for generic benefits, esp. in environmental area re standards, ie reduces waste of effort.
- (2) for centres of excellence by creating links and other cooperation at scientist level
- (3) speed of development to increase payback period, eg vertical cooperation, eg materials supplier, manufacturer & product supplier
- (4) reduce risk of failure (as R&D is rising with increasing rapidity), ie can ?? have more projects in development.

Critical success factors for success in EC proposals

1. must be technically valid, must fit programme
2. committed and of like-mind groups
3. good management (complex, cross borders etc) internal discipline
4. good dialogue with EC services, ie well presented
5. staff availability at culmination for project submission

Reasons for failure

1. increased competition (~1 in 7 and rising)
2. projects can be too big leading to fragmentation (if too small is it worth effort)
3. insufficient leadership in coalition at high level
4. poor presentation
5. changes to criteria for assessment can occur especially in socio economic added criteria (need better communication from EC)
6. cost cutting after assessment, eg EC offers -20% less, can cause problems
7. coalition stability and management commitment

Be philosophical, cannot win with all, don't waste time on poor projects

Proposals to the EC for the future - one view

- Better model for European growth including technology, esp. in industry to deliver policy objectives
- Proposal to facilitate innovation, to take away barriers and other self inflicted impediments, eg in environment, fears about adverse effects in biotechnology, have done more damage than anything else.
- Balkanisation of DG's need to be removed.
- Intellectual property rights - systematic approach in competition to eg as in Korea.

Fundamental vs applied, put more when most impact is to be made.

Questions and comments.

- Ability to talk across Europe - advantageous, collaboration a beneficial output, esp. cost effective - in cost
- EC proposals are assessed not by EC itself but by independent experts based on guidelines but interpretation can vary however.

2.5.2 Case Study 2 - Experience of participating in EC R&D Programmes

Dr Brian Isherwood, Hirst Research Centre, GEC Marconi Ltd.

His company is in an intermediate position between GEC Research and the real world. Consider for group proposals to EC

1. technical need
2. exploitation route
3. time scales to market could be input to other projects
4. resources - skills, expertise etc.
- 5.

The advantage of a decision to go collaborative can be the sharing of risk and the sharing of resources. Three examples given

Example 1 - power thyristors - copper to silicon heat sinks with 300°C thermal differences - worked and marketed product

Example 2 - super conductors to make power cables - highly competitive mainly research with only a little development

Example 3 - low melting point brazes eg to stick airframes together, ie to be able to allow designers to exploit design but not to make brazes

ADVICE to proposers

- Act early, when call comes it is almost too late comply with guidelines
- Select lead company (technical, admin, financial)
- Language advantage, especially English - the near official language of programme.

After submission of proposal

Acceptance or refusal

- if failure, only verbal response given, ask for feedback reason for failure (1 page written and 'opportunity to discuss this is available' EC presenters quote), ask about closeness to success
- if successful - write consortium collaborative agreement (leave it to lawyers, but specify time scale)
 - collaboration, continuity of staff no substitutions
 - little nationally barriers for technical ?
 - lead company is in charge, coordinate and submit reports for all partners, and to overseas partners
 - coordination group and subgroups, need ?? interchange, consider staff secondment etc.
 - reports, can form useful adhesion between groups not just a chore!
 - technical liaison officer (now Project Technical Auditor in Brite-Euram appointed)

- and paid for by project)
- active finance of project, ie auditable books and response on a particular day (can be too high)
 - in EC 9 month delay normal, no names, no coherent approach
 - exploitation
 - interrogation
 - measure of success

2.5.3 Case 3 - An SME's view, Ian Catling, Director, Catling Consultancy Road transport telematics

Small companies advantages

1. Quick reaction/response, lack of inertia
2. Easy access to key areas of bigger companies
3. language
4. smaller, therefore lower, overheads, but consultancy arrangements from bigger companies

BUT disadvantages can be

5. problems of delayed advanced payments
6. banking problems
7. EC management sub-committee

2.6 Discussion

- Technical audit can be valuable - 'cost and adjustments available' EC presenter quote
- Management by head leader can be onerous (5-10% of effort available)
- Payments check bank transfer code (does not seem to apply to NERC)
- Check ratio of inflation in proposal values between partners if reduced funding offered by EC after broad acceptance of project
- Charges between Framework and Eureka to be expected; details uncertain.

I E T T Conference

LONDON

THE FOURTH FRAMEWORK PROGRAMME

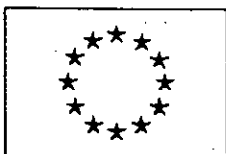
FP IV

Implications for Collaborative Research

NICHOLAS E W HARTLEY

DG XII / C-1 - Industrial Research

6 JULY 1993



COMMISSION
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NH/DGXII/C-1

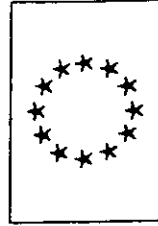
"Framework Programme"

- o The Commission's publicly stated background to the execution of RTD (Research and Technological Development) on behalf of the Community
- o Legal and financial basis
- o Management and budgetary tool



Previous Framework Programmes

		Budget (MECU)	Themes
FP I	1984 - 87	700	Energy; IT
1986 : Single European Act : RTD becomes part of EC policy			
FP II	1987 - 91	5400	IT; Cooperation
FP III	1990 - 94	5700	Enabling Technologies & Natural Resources
FP IV	1994 - 98	13100	Strategic RTD



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FOURTH FRAMEWORK PROGRAMME

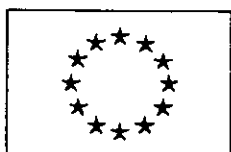
(1994 - 1998)

	MECU (current prices)
First Activity (Research, Technological Development and Demonstration Programmes)	10925
Second Activity (Cooperation with Third Countries and International Organizations)	790
Third Activity (Dissemination and Application of Results)	600
Fourth Activity (Stimulation of the Training and Mobility of Researchers)	785
MAXIMUM OVERALL AMOUNT	13100

Fourth Framework Programme

Organisation

Four "Activities"		% of Budget
1	RTD and Demonstration Programmes Seven strategic areas	83.4
2	Cooperation Three strategic areas	6.0
3	Results Four strategic areas	4.6
4	Training One strategic area	6.0
		100.0



Fourth Framework Programme

Increased emphasis on:

- o Competitiveness
- o Policies of EC
- o Society's Needs



Fourth Framework Programme

Achieved through policy changes concerning

- o Integration
- o Economic Impact
- o Flexibility



Integration

- o Reciprocity between national research policies and EC RTD policy
 - coordination
 - subsidiarity
("Community added value")

- o "Megaproject" activities - Fusion, human genome, global change ...

- o - Creation of a "European Research Area" through coordination of EC research and CERN, ESA, EMBO etc



Economic Impact (i)

- o Closer links with Community RTD policy and other policies (environment, transport ...)
 - focus on generic technologies
 - greater selectivity
 - support for specific industries (aeronautics, car ...)

- o Prenormative (eventually pre-legislative) research



Economic Impact (ii)

- o Dissemination and exploitation of results
- o SMEs
- o Education; training; academic links
- o Develop research/training synergy
 - skills



Flexibility

- o Of RTD to respond rapidly to new scientific and technological challenges
- o Of procedures and decision making



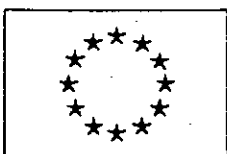
Documents

- 1 "Working Document of the Commission concerning the Fourth Framework Programme of Community Activities in the Field of Research and Technological Development (1994-1998)"

COM (92) 406 final, 9 October 1992

- 2 "Second Commission Working Document concerning RTD Policy in the Community and the Fourth Framework Programme (1994-1998) of Community RTD Activities"

COM (93) 158 final, 22 April 1993



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NH/DGXII/C-1

Documents (cont'd)

3 "Proposal of the Commission concerning the Fourth Framework Programme (1994-1998) of Community RTD Activities"

COM (93) 276 final, June 1993



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NH/DGXII/C-1

Second Working Document

Structure

1 Summary

- Objectives : Update; Edinburgh;
Comments on 1st
Working Document
- Policy Changes
- Greater Selectiveness
- Research / Training Synergy
- Flexibility
- Financial Resources

2 Explanatory Memorandum

- Amplification of Above

3 Annexes



Second Working Document

Annexes

- I - Financial Envelope (and Indicative Breakdown Between Themes in the first Activity)
- II - Selection Criteria for Community Activities

III - Scientific and Technological Objectives



Annex III

Scientific and Technological Objectives*

First Activity (10,925 MECU)

- o Information and communications technologies, and infrastructure
- o Industrial technologies
- o Environment
- o Life sciences and technologies
- o Energy
- o Research for a European transport policy
- o Targeted socio-economic research

* 54 core thematic areas (1st W.D.) reduced to 28

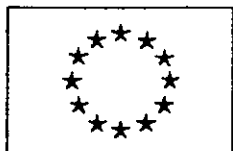


Annex III

Scientific and Technological Objectives (continued)

Second Activity (790 MECU)

- o Scientific and technological cooperation in Europe
- o S and T cooperation with non-European industrialised countries
- o S and T cooperation with developing countries



Annex III

Scientific and Technological Objectives (continued)

Third Activity (600 MECU)

- o dissemination and utilisation of results
- o transfer of technology
- o financial environment of the transfer (eg funds for technology take-up (SMEs))
- o scientific services for Community policies (ie JRC's scientific and technical support for Community policies)



Annex III

Scientific and Technological Objectives (continued)

Fourth Activity (785 MECU)

- o training and mobility of young research scientists



Annex III

Scientific and Technological Objectives (continued)

In addition to traditional funding mechanisms, integration will be encouraged through

- Thematic networks of excellence
(n.b. market oriented)
- Concertation networks
eg link-up of National laboratories
- Consortia for integrated projects
eg Fusion etc



Conclusions

There are many opportunities for Industry, academia and research centres to participate in FP IV.

Participants in FP IV - whether in research projects, academic exchanges, study contracts, coordination activities or financial "instruments" - should be strongly aware of the European Dimension of their activity and the wider context of their work.

Proposers who have a narrow, nationalistic view and who over-focus on purely scientific and technical objectives are unlikely to succeed and will not benefit from these opportunities.



COMMISSION OF THE EUROPEAN COMMUNITIES

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SECOND COMMISSION WORKING DOCUMENT CONCERNING RTD POLICY
IN THE COMMUNITY AND THE FOURTH FRAMEWORK PROGRAMME
(1994-98) OF COMMUNITY RTD ACTIVITIES

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SUMMARY
OF THE
SECOND WORKING DOCUMENT
CONCERNING THE FOURTH FRAMEWORK PROGRAMME
OF RTD AND DEMONSTRATION ACTIVITIES (1994-98)

Objective:

To update the first working document of October 1992 (COM(92)406) to take account of:

- the Edinburgh conclusions
- developments in the world context
- comments and opinions concerning the first working document

in order to accelerate interinstitutional deliberations on the Fourth Framework Programme (political agreement) and reach a rapid agreement following ratification of the Maastricht Treaty.

Policy changes:

- Greater selectiveness with regard to Community RTD activities in order to increase their economic impact (focusing on generic technologies)
- Greater integration of national, Community and European activities (Article 130h of the EC Treaty)
- Develop research/training synergy
- Increase the flexibility of Community activities in order to respond rapidly to new scientific and technological challenges
- Bring the financial data into line with requirements and the new financial perspective for 1993 to 1999.

Greater selectiveness

- The Fourth Framework Programme covers all research, technological development and demonstration activities. It comprises four activities. The first (RTD and demonstration programmes) contains only seven themes compared with 15 in the Third Framework Programme. Two new themes are introduced: research for a European transport policy and targeted socio-economic research. Each theme covers one or more area of RTD and demonstration.
- The selection criteria set out in the first working document have been adjusted to take account of the need to focus and integrate activities, thus reducing the number of areas originally proposed from 54 to 28.
- Compared with the October 1992 document, greater priority is accorded to the first activity in order to take account of the Edinburgh guidelines concerning the need to focus on generic technologies of multisectoral application.
- When the Commission prepares its formal proposal a selection will be carried out within the individual areas as well in order to focus activities on mobilizing projects and integrate national, Community and European activities to a greater extent.

This objective will be pursued at three levels:

- *preparation of RTD and demonstration policy options (a new area is proposed in order to promote work in support of decision making)*
- *political level (regular Ministerial consultations)*
- *operational level: between those responsible for RTD activities.*

Appropriate procedures need to be developed within the programmes on the basis of the experience built up and the desire to encourage researchers at national, Community and European level to work together.

Research/training synergy

In order to promote growth and reinvigorate economic and social development a combination of labour and capital is not enough; a third factor is needed – a combination of knowledge, know-how and dissemination of know-how.

Research training activities will be carried out within the themes of the first activity and across the board (fourth activity) to promote the cross-frontier mobility of researchers working on emerging themes. They will be supplemented by research activities making it possible to introduce innovation into education and training systems and by education and training schemes deriving from the COMETT and ERASMUS programmes, etc.

Flexibility

The decisionmaking system is very unwieldy. The Community needs to be able to respond rapidly to scientific and technological changes intervening between the adoption of a framework programme and its review after three years.

Measures are proposed at three levels:

- *framework programme: preparatory activities*
- *specific programmes: limited amount for technology promotion earmarked for unsolicited proposals from SMEs; links with EUREKA*
- *work programmes: adaptability.*

Financial resources

- *13.1 billion ECU (current prices) for the 4th Framework Programme (1994-1998);*
- *with regards to the distribution between the four activities within the Framework Programme, increased priority will be given to the third activity (dissemination) and, to a lesser degree, to the second activity (international cooperation) relative to funding levels during the period 1990-1994;*
- *within the first activity (RTD and demonstration programmes), it is suggested, as an indicative breakdown, to give increased priority to work addressing industry's needs and affecting industrial output within all the topics, as well as to research on a European Transport Policy and life sciences and related technologies.*

EXPLANATORY MEMORANDUM

Introduction

1. In October 1992 the Commission published a working document concerning the Fourth Framework Programme (COM(92)406) with a view to pressing ahead with the discussion on the general guidelines for this Framework Programme pending ratification of the Treaty on European Union. The first working document provided an opportunity for a wide-ranging debate with the constructive participation of the Member States, the European Parliament, the Economic and Social Committee and other Community organizations, together with research scientists and representatives of industry. A very significant point which emerged from the discussions was the emphasis placed on the important role of research with a view to improving the quality of life and strengthening the competitiveness of industry in the Community.
2. In Edinburgh in December 1992 the European Council stressed the need for Community RTD activities to continue to focus on generic, precompetitive research with a multisectoral impact; at the same time it finalized the financial perspective for 1993-99, laid down the general framework for the Community funding allocated to research and called on the Commission to make some changes:

"Community support for R&D should continue to focus on generic, precompetitive research and be of multisectoral application. EUREKA should remain the principal vehicle for supporting R&D activities which are nearer to the market and the Commission should bring forward proposals to improve the synergy between the Community's research activities and EUREKA. Improving the dissemination of results amongst enterprises, particularly small and medium-sized businesses, cost-effectiveness and coordination between national programmes should be priorities for Community action. These conclusions should be reflected in the consideration and adoption of the Fourth Framework Programme."

The European Council also called upon the Commission:

"to bring forward proposals for improving the management and efficiency of research funded by the Community to achieve better economic effectiveness. To this end the selectivity of actions should be increased, and it should be ensured that Community activities contribute the most value added possible to efforts already under way in the Member States."

This second working document takes account of the comments received, developments in the world context and the guidelines issued at the Edinburgh European Council. It complements and clarifies the broad lines set out in the October 1992 working document indicating how to mobilize more effectively the capacities of the Community as a whole, the aim being to move away from a discussion focusing in the main on the activities themselves to concentrate on the framing of a genuine RTD policy for the Community. The object of this approach is to secure agreement between the three institutions on the broad lines of the Fourth Framework Programme by mid-1993 and to facilitate rapid adoption of the formal proposal which the Commission is to put to the Council and Parliament once the Treaty on European Union is ratified and enters into force.

The Fourth Framework Programme should:

- make Community activities more selective so as to increase the economic spin-offs from Community research, in particular by concentrating on generic technologies which will enable European industry and its subcontractors to go back on the offensive in international competition;

- seek a closer *integration of national and Community RTD activities*;
- create the conditions for increased *synergy between research and training*;
- empower the Community, using appropriate means, to *respond rapidly* to scientific and technological change;
- be allocated sufficient financial resources to *maintain a sustained effort at Community level* to pursue realistically the objectives set by the Treaty on European Union and thus contribute the most value added possible to efforts already under way in the Member States.

greater selectiveness to secure improved economic benefits

This entails being more selective in the activities carried out, so as to lay the scientific and technical foundations needed for sustainable, environment-friendly development in industry, agriculture and services, exploiting the advantages of the single market in order to improve Europe's competitiveness and the quality of life.

In keeping with the Community's industrial policy strategy endorsed by the Council and given the needs of the other common policies, research activities should focus on precompetitive research into technologies with a multisectoral impact which can help increase industrial competitiveness, especially in key areas, and on themes of interest to society in general; it is necessary to ensure that the results are transferred rapidly to industry, especially to small and medium-sized businesses and to the branches of the economy which will use them. Certain major objectives guide the choice of research activities: to develop efficient and safe infrastructures and in particular an information and communications technology infrastructure; to produce efficiently, cleanly and safely on the basis of modern organization of production; to make environmental protection an aspect of industrial competitiveness; to promote an improvement in health-care and food quality and food hygiene; to ensure technological and industrial integration within the internal market (in particular by strengthening coordination between RTD policy and standardization policy); to anticipate technological and industrial changes so as to ensure that greater account is taken of the needs of the market; to increase the synergy between international cooperation activities and the Community's external policies.

The focusing of Community RTD activities is reflected at three levels:

- the structure of the Framework Programme: on the grounds of rationalization it is proposed that the first activity (research, technological development and demonstration programmes) should be organized around seven main themes including two new themes concerning research into a European transport policy (strategic aspects and systemic and general aspects resulting from Community transport policy and leading to generic activities coming from other themes) and the targeted socio-economic research. Annex I proposes a structure for the Fourth Framework Programme which ensures a large degree of continuity with the Third Framework Programme and takes into account the new elements needed;
- selectiveness criteria: Annex III to the first working document set out criteria for defining Community RTD activities, Annex II to this document (Selection Criteria for Community Activities) supplements these criteria, adding points concerning greater focusing of activities and the integration of national and Community activities; they will be applied when selecting projects;
- applying these criteria to focus Community activities on a smaller number of research, technological development and demonstration areas: the detailed description of the subject matter of the activities proposed for the Fourth Framework Programme will be finalized when the Commission presents its formal proposal. However, it is possible to make progress in the inter-institutional discussion

On this subject, the Commission's examination of the many comments on the 1990 objectives document (1990) prompts the Commission to suggest a significant reduction of the number of core thematic areas in the first working document (from 54 to 28, in line with the financial perspective, the criteria set out in Annex II, and the opinions received to it). Annex III sets out the reasons for and the results of this focusing exercise. Lastly, it relates this smaller number of areas to the four activities of the Fourth Framework Programme, including the major themes making up the first activity.

Greater integration of RTD activities in Europe

The principle of subsidiarity dictates that the Community should take action on research, only if the objectives can be better achieved by the Community than by the Member States acting on their own. Article 130h of the Treaty on European Union also requires the Community and the Member States to coordinate their activities so as to ensure that national policies and Community policy are mutually consistent. It must be acknowledged that not enough has been done on this point so far. A new approach is needed, with the detailed procedures tailored to each research area.

Such consistency is pointless unless the Community aims to achieve the harmonious development of its scientific and technological resources. Synergy between RTD policy and the structural policies should be strengthened. The amendments proposed by the Commission to the Regulations governing the Structural Funds provide one opportunity in this connection during the new programming period (1994-99). The emphasis now being placed on technology in the less-favoured regions and on skills in the area of science and technology offers new prospects for synergy, in particular with the third and fourth activities of the Fourth Framework Programme. While applying the principle of excellence, Community RTD activities provide a second opportunity. The research priorities reflected in the first activity of the Fourth Framework Programme take account of the interests and capacities of the Member States, including the less advanced ones. The RTD programmes can make an effective contribution at little cost to making good use, for the benefit of the Community as a whole, of the scientific and technological potential of the less-favoured regions by networking them with centres of excellence in the most advanced regions. The third and fourth actions will have a growing impact on the less developed regions and countries through specific measures (national/regional relay centres, transfer networks geared to the traditional industries, measures to avoid the "brain drain", "European chairs"). This synergy between the Structural Funds and research activities would contribute to a genuine cohesion policy by developing the potential of the regions and relating them to the European research area. However, it should not be forgotten that it is primarily the responsibility of the Member States to establish an overall strategy aimed at making the best use of the capacities created by the various sources of Community funding available. A Commission paper on synergy between RTD policy and the structural policies will be sent to the Council, the European Parliament and the Economic and Social Committee.

The call for greater consistency between the national policies and Community policy is based on the fact that less than 4% of all government expenditure on civil research and technological development by the Member States is on joint action under a Community policy.

It is proposed that the following types of action should be launched:

- evaluation of science and technology policy options to supply a common knowledge base for discussions on RTD activities in Europe (see Annex IV);

concertation at the higher level, in the form of regular meetings of the European Ministers of Research in conjunction with the Ministers with special responsibility for industry and economic development specifically on this issue:

- concertation at the operational level between the heads of the national and European research bodies and those responsible in industry (producers and users).

As far as the practical implementation of RTD activities is concerned the integration of national and Community activities could be achieved in three ways:

- greater synergy and mutual enhancement of the action taken at national level could be achieved by giving priority in the specific programmes to activities aiming at such closer integration;

- in fields where worldwide collaboration is already established, only a coordinated, united Europe will be able to hold its own in talks with the other major partners, particularly the USA and Japan; it is proposed that national and Community activities should be integrated to a large extent in certain areas which lend themselves to this approach;

- integration to create the "European research area" while maintaining the diversity and plurality of approaches will require closer coordination of the research conducted at European level under the auspices of international bodies such as CERN, ESA, ESO, EMBO, EMBL and the ESF.

3. Alongside the traditional networks established in the context of Community activities hitherto, this integration can be achieved with thematic networks of excellence, concertation networks and consortia for integrated projects (see Annex III).

The Joint Research Centre will make its contribution to this new approach.

Synergy between research and training

9. Building on the existing Human Capital and Mobility Programme, activities to promote the mobility of researchers and stimulate the creation of networks must form an important element of each theme in the first activity under the Fourth Framework Programme. They should also be the subject of a general activity (fourth activity) to develop human resources so as to make it possible to react to new research areas or subjects which emerge.

Furthermore, research into education and training in Europe should promote the introduction of innovations into training methods. A new research area is therefore proposed.

10. The role of training activities, which seek to raise the general level of scientific and technical competence, is likewise of strategic importance. This calls for action to build on the foundations laid by the Erasmus and Comett programmes by promoting training at European level and mobility as well as promoting scientific information and culture in Europe alongside the implementation of the Fourth Framework Programme.

The ability to respond rapidly to developments in science, technology and industry

11. Related to the objective of improving the economic spin-offs from Community research there is the problem of the speed of response to developments in science and technology. The Community's institutional and decision-making framework for RTD is unwieldy.

The Community, therefore, has to be able to respond swiftly to developments in order to maintain the inter-institutional balance. This means first of all respecting the nature and detail of the first two levels of Community legislation (Framework Programme, specific programmes) and the implementation level (work programme). Flexibility could be built into Community RTD activities at three levels:

- Framework Programme: provision must be made for a limited range of activities so that preparatory activities, definition phases for new programmes and possibly pilot projects can be launched between the time when the Framework Programme is adopted and its mid-term review;
- specific programmes: to ensure flexibility, a limited amount of funds should be set aside, in each specific programme, for unsolicited proposals from operators (mainly from SMEs and technical centres - research organizations) which have to be processed very quickly (technology promotion);
- work programmes: the ability to adapt the work programmes under the specific programmes will enable the Member States and the European Parliament to have a real say in how to respond to developments in science and technology: in the case of the Member States, by being represented on the programme committees and, in the case of Parliament, through the annual budget procedure.

12. The need to strengthen links between Community activities and EUREKA should be stressed in this context. Recalling the respective roles of EUREKA and Community research, the Edinburgh European Council emphasized the need to strengthen the synergy between them. Considerable progress has been made in this connection, and the basis for greater cooperation has been established by the Commission and the EUREKA authorities in accordance with the twin principles of greater transparency in the procedures followed by the countries concerned with regard to EUREKA projects and the Framework Programme and a clearer definition of their respective roles. The essential elements are better circulation of information concerning projects and support measures (standardization etc.), the taking into consideration in EUREKA projects of the results of Community projects, greater clarity in the definition of the respective roles of each forum vis-à-vis industrialists, and especially SMEs, more systematic taking into account of the precompetitive phases of EUREKA projects within the Framework Programme and joint examination of large-scale strategic projects proposed by industrialists. As regards the Community, this entails the establishment, after an extensive pilot phase, of new mechanisms for taking into account projects from the EUREKA network outside the timetable for Community calls for proposals in accordance with the normal selection rules, along the lines of earlier decisions taken on a case-by-case basis concerning certain large EUREKA strategic projects (JESSI, HDTV, COSINE). The financial resources to be allocated to this activity could be included on an indicative basis in the work programmes for the Community programmes. The same would apply to projects which are part of a research activity within other European scientific and technological cooperation forums. The projects would be taken into account by the respective authorities (in the case of the Community, by the Commission assisted by the committees, on which the Member States are represented) and compared with the merits of projects proposed following the publication of Community calls for proposals. Any involvement by the Community would have to be consistent with the objectives of the specific programmes and confine itself to the precompetitive and generic aspects of projects submitted to the committees for appraisal. EUREKA's national and international authorities should ask the industrialists concerned to look more systematically at the relationship with Community RTD actions at each stage right from the definition of EUREKA projects through to their execution. EUREKA should remain the main vehicle for support for RTD activities which are closer to the market, including demonstration and production development projects, and give rise to increased coordination between the RTD activities of the EUREKA member countries, while drawing benefit from the flexibility and "bottom-up" nature of the initiative.

The financial implications of the RTD priorities

13. In the context of the financial perspective decided upon in Edinburgh, the new guidelines and the resulting priorities for RTD have the following financial implications:

- the maximum overall amount allocated to the Fourth Framework Programme for the period 1994-98: the 1993-99 financial perspective decided upon in Edinburgh lays down a maximum overall amount for Community RTD activities ranging between one-half and two-thirds of the funding for internal policies over that period; also the growth in RTD expenditure must be consistent with the overall growth in spending on the internal policies (category 3 of the financial perspective); on the basis of RTD expenditure for 1993, the Commission has adjusted its October 1992 assessment taking into account these various considerations and an appraisal of the financing requirements, and is now proposing ECU 13.1 billion ECU at current prices for the Fourth Framework Programme (cf. Annexe 1). This financial envelope, however, must cover needs expressed by the whole of the Community and thereby contribute to supporting the competitiveness of its industry. Given the increased emphasis on priority areas, this amount will considerably strengthen certain activities whilst at the same time allowing certain new areas to be included within the first activity; among other things it will cover the needs of the energy demonstration activities which were previously the responsibility of the THERMIE programme and which are now the responsibility of the Framework Programme; it also guarantees an adequate reply by the Community to external challenges such as massive investments by other countries, notably the USA and Japan and internal challenges such as the tendency not to increase national research budgets;
- the breakdown of this overall amount between the four activities and the relative priorities assigned to the major themes making up the first activity: Annex I sets out the relative shares for each of the four activities proposed; the financial balance between the four activities has been altered compared with Annex I to the first working document to take account of the decisions taken and guidelines issued by the Edinburgh European Council (financial framework, priority given to the first activity concerning generic technologies, greater importance attached to dissemination and utilization of results within the themes and at centralized level); given the comparative importance of this first activity, Annex I also gives additional indications concerning the respective priorities assigned to the major themes making up this first activity. Thus it is proposed to finance each research for a European Transport Policy to the tune of 280 MECUs given that the Community transport policy requires specific research work which must be sufficiently financed; among other things so as to contribute to a better quality of life in Europe, life sciences and related technologies must benefit from of tools to help with decision making in the field of Community RTD policy on the other hand require specific research work which must be adequately financed; further so as to contribute to improving the quality of life in Europe, the life sciences and related technologies must benefit from additional means in order to cope with increasing needs to do research in general biotechnology and biomedicine and health, as must the research that is needed to accompany the reform of the Community policies in the field of agriculture, forestry, rural development, fisheries and fish farming.

ANNEX I

FOURTH FRAMEWORK PROGRAMME (1994-98)

	MECU (current prices)
First Activity (Research, Technological Development and Demonstration Programmes)	10925
Second Activity (Cooperation with Third Countries and International Organizations)	790
Third Activity (Dissemination and Application of Results)	600
Fourth Activity (Stimulation of the Training and Mobility of Researchers)	785
MAXIMUM OVERALL AMOUNT	13100

MECU
(current prices)

Indicative breakdown between themes in the first activity

-Information and Communications Technologies	3900
-Industrial Technologies *	1800
-Environment *	970
-Life Sciences and Technologies *	1325
-Energy *	2525
-Research for a European transport policy	280
-Targetted Socio-economic Research *	125

	10925

* of which JRC 1067 MECU. N.B.: in addition to participating in the first activity the JRC will also participate in the third activity to the tune of 70 MECU.

ANNEX II

SELECTION CRITERIA FOR COMMUNITY ACTIVITIES

All the scientific and technical objectives indicated in the Framework Programme must be clearly defined, carefully selected and pursued applying the following criteria:

1. Community research, technological development and demonstration (RTD) activities must focus on clearly defined objectives which will contribute towards:

- strengthening the technological base of Community industry and providing it with the knowledge and know-how (skills) required to make it more competitive at international level;
- defining and implementing Community policies; or
- meeting the needs of society and promoting a sustainable development.

This approach will also yield short-term, medium-term or long-term economic benefits and should contribute to the strengthening of economic and social cohesion in the Community, while being consistent with the pursuit of scientific and technical quality.

2. The Community's RTD activities must observe the principle of subsidiarity, whereby the Community takes action if, and only if, the objectives cannot be fully achieved by the Member States and can be better achieved by the Community.

3. On this basis, the following types of action could warrant Community activities:

- action on a very large scale for which Member States could not provide the necessary facilities, finance and personnel, or could only do so with difficulty ("critical mass");
- activities tackling ambitious themes, addressing large-scale problems or of long-term scientific benefit. Activities of this type require specific research at Community level and can thus often enhance the Community's overall contribution to the solution of international problems;

- activities producing obvious financial benefits which justify joint action even allowing for the extra costs inherent in all international cooperation;
- activities which are complementary to those being carried out nationally and which aim at strengthening the scientific and technological base of the Community as a whole and where there is a better chance of applying the results at Community level;
- activities contributing to the achievement of a common objective, such as completion of the single market or unification of the European scientific and technical area, and, where the need is felt, to the establishment of uniform rules and standards.

4. The Community's RTD activities must form part of projects to be assessed on the basis of their scientific and technical excellence.

In this process of selecting the projects to be carried out in the specific programmes, priority will be given to projects:

- allowing closer integration of the research being conducted in the Member States, at Community level and within other European and international cooperation forums;
- making it possible to respond as effectively as possible to the Community's objectives regarding economic and overall industrial competitiveness.

ANNEX III

SCIENTIFIC AND TECHNOLOGICAL OBJECTIVES

1. The new guidelines for a genuinely Community RTD policy, as reflected in the criteria set out in Annex II to this document, have compelled the Commission to engage in a stringent focusing and selection exercise affecting all the RTD activities set out in the first working document (COM(92)406).

The activities selected are designed to support the common policies and are primarily aimed at strengthening the Community's scientific and technological bases and those of its industry in order help it compete more effectively at international level. In particular, in the light of the industrial policy adopted in 1990 and in order to meet the growing needs of society, a number of Community public-interest objectives have been identified (see point 4 of the Explanatory Memorandum); Community research should make a contribution to achieving these aims.

To use Community funds as efficiently as possible, a preliminary selection has been made between the core thematic areas proposed in the first working document and within each of them.

Where each research area is concerned, particular attention has been paid to the possibilities of integrating national, Community and European activities.

2. The following list of RTD activities indicates that this focusing exercise has entailed a significant reduction in the number of core thematic areas from 54 in the first working document to 28 areas in this one:

First activity

Information and communications technologies; developing the information and communications infrastructure

- telematic technologies in support of applications of general interest
- technologies for integrated information and communications systems
- technologies for advanced communications services
- information technologies

Industrial technologies

- design, engineering, and systems technologies and technologies for the human-centred organization of production
- materials and materials processing and recycling technologies
- advanced propulsion systems
- standardization-related research, measurement and testing

Environment

- natural environment and global change
- innovative environmental protection technologies

Life sciences and technologies

- General biotechnology
- biomedicine, health and drugs
- application of life sciences and technology in agriculture, forestry, rural development, agro-industry and fisheries

Energy

- technologies for cleaner and more efficient production and use of energy
- nuclear safety
- controlled thermonuclear fusion

Research for a European transport policy

- research for a European transport policy

Targeted socio-economic research

- research into problems of social integration
- research on education and training
- evaluation of science and technology policy options

Second activity

- scientific and technological cooperation in Europe
- scientific and technological cooperation with non-European industrialized countries
- scientific and technological cooperation with developing countries

Third activity

- dissemination and utilization of results
- transfer of technology
- financial environment of the transfer
- scientific services for Community policies

Fourth activity

- training and mobility of young research scientists

3. In order to conduct the research two main avenues will be used: (i) focusing financial resources on a limited number of subjects selected for their specific added value (shared-cost activities) and (ii) encouraging the integration of national, Community and European activities by appropriate means

In particular, alongside the traditional networks established in the context of Community activities hitherto, this integration can be achieved by the following means:

- *Thematic networks of excellence* bringing together for a given technological or industrial objective manufacturers, users, universities and research centres to facilitate the integration and transfer of knowledge and technologies and ensure that greater account is taken of the needs of the market. They would be organized, with catalytic support from the Community, along the lines already tested in areas such as microsystems, linguistics and flexible manufacturing. They would be "bottom-up" in both design and management.
- *Concertation networks* in which the Member State would play an important role by identifying the national laboratories or institutes which would take part in the activity decided upon. The Commission would organize the concertation. This method could be used to carry out epidemiological research and clinical studies under the biomedical research programme, for example.
- *Consortia for integrated projects* along the lines of the Fusion Programme. The Member States identify the laboratories or institutes which would take part in the integrated project which would be supported by pooling financial resources from the Community. Major European research bodies such as CERN, ESA and EMBL could also be invited to take part.

In this connection, the Commission considers that the JRC can make a contribution towards the implementation of this new approach. As it is itself actively engaged in research, and is closely involved in the formulation and implementation of Community policies, it could play the role, in the scientific and technical areas where its competences lie, of organiser, of focal point for networks bringing together public and private laboratories in the Member States, and could act as a centre of gravity for European research consortia in specific areas.

The following descriptions reflect this new approach.

FIRST ACTIVITY

Research, technological development and demonstration programmes

Information and communications technologies:

Developing the information and communications infrastructure

Over the last few years, information and communications technologies (ICT) and industries in Europe and in the rest of the world have undergone far-reaching changes which call for a rethink of the priorities and procedures for the Community's RTD activities in this field.

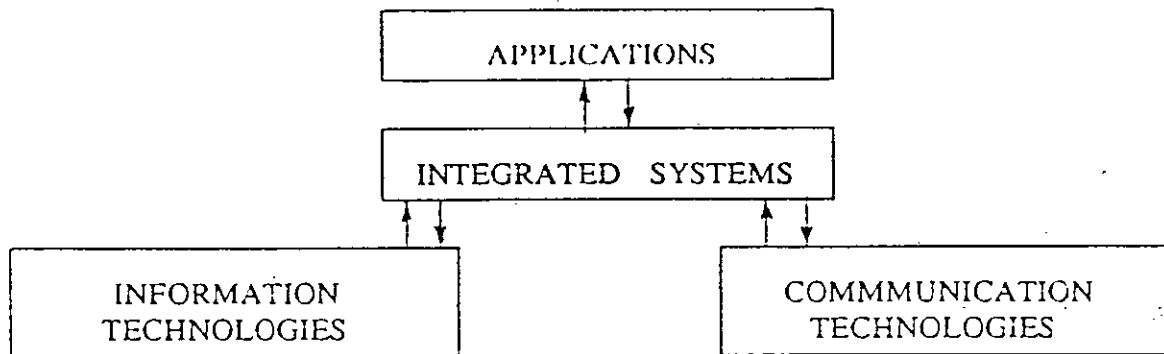
The blurring of the borderlines between information and communications technologies and other sectors, coupled with the growing overlap between information technology, telecommunications and telematics, make the establishment of new information and communications infrastructure essential both for overall economic growth and to meet society's new needs. Whereas in the 1980s RTD policy focused on the technology for a growing ICT industry, for the 1990s the Community needs a user-orientated policy geared to developing the new infrastructure.

This new infrastructure encompassing all technologies, products, services and applications combining electronics, information technology and telecommunications into increasingly integrated systems reflects a series of contrasting phenomena.

It is dynamic. This information and communications infrastructure optimizes the contents of the data, as input, storage, processing and transmission capacity and efficiency rise rapidly and relentlessly as a result of technological progress and the closer involvement of users keen to steer developments towards satisfying their own specific needs.

It also determines the development of most economic and social activity. Businesses need this infrastructure to gather financial and commercial data without delay, to transfer funds, to exchange specifications with their partners and to avail themselves of specialist services which they would not otherwise be able to obtain. Increasingly, manufacturing processes based on advanced information technologies are enabling industry to provide higher quality products at lower cost with minimum impact on the environment. Workers in small firms can look forward to access to distance-learning vocational training courses in the near future. Efficient operation of government departments, health-care systems and transport networks also depends on this infrastructure, which must meet the new challenges facing society.

The new infrastructure consists of four main technological components with the following overall structure:



ICT areas encompass the technologies which are at the very heart of the infrastructure and which supply the component elements for systems incorporating these two technologies. In their turn, they form the basis for the implementation of applications in areas such as health-care, transport and education. This four-part structure determines the main areas in which RTD efforts should be focused.

By contrast, the economic situation and the interest shown by the users themselves are leaving the pace of technological progress further and further behind demand. The market is slowing down, competition is becoming fiercer and users are growing more demanding as they learn to take advantage of the range of options offered by open systems which release them from their dependence on the makers.

This paradox - with information and communications technologies becoming increasingly necessary and omnipresent but less and less profitable - poses a serious challenge to the economy and social progress and, in particular, calls for a new research and technological development policy from the Member States and the European Community.

Given the economic and structural difficulties currently confronting the industries in question and the budget restrictions, there is a growing danger that establishment of this new information and communications infrastructure could be cast into doubt or delayed which, in turn, could jeopardize economic recovery and the vital response to society's new needs. This is why the public authorities all over the world are showing renewed interest in information technology, electronics and telecommunications.

The facts have now been recognized and action has been taken in Japan, the United States and several Member States.

The European Community has long been aware of the economic and social importance of new information and communications technologies. Both the Second and Third Framework Programmes successively increased the share of the funding earmarked for their development.

However, the Community's efforts in this field must be radically adjusted to the new situation described above, which will entail adapting both the content of the programmes and the procedures for implementing them.

As regards the content of the activities, the Commission feels that the European Community's contribution should concentrate on a limited number of priority generic technologies or technologies with multiplier or structural effects, by virtue of the type of activities to which they apply.

Four areas, each combining continuity and novelty, comply with these criteria. They focus on the four components of the information and communications infrastructure defined above. They were selected after careful examination of the strengths and weaknesses of industries and research centres in the Community with regard to infrastructure needs, taking account of the conclusions of the recent evaluation of the programmes and of the views expressed by the national authorities within CREST and on the management committees.

They cover the development of:

- telematic technologies in support of applications of general interest;
- technologies for integrated information and communications systems;
- technologies for advanced communications services;
- information technologies.

These four areas combine the contents of a number of the core themes included in the working document submitted to the Council and the European Parliament on 9 October 1992 and are defined in greater detail below.

The first area concerns application programmes tailored to society's fundamental needs and to creating new markets for the data processing and communications industries. The aim of these programmes is to develop technologies which can be added to the basic technologies in order to satisfy the requirements of specific uses and the need to develop functional specifications and to confirm the R&D results in full-scale tests.

These include technologies for health-care services and the integration of the handicapped and the elderly, and for telematic systems for transport and flexible and distance learning, for rural areas and for exchanges of information between researchers, libraries and administrations.

These themes are taken from core themes 5, 8 and 9 in the first working document, and include the part of core theme 18 relating to the handicapped and the aged.

The second area covers projects combining data processing and communications technologies into complex, multi-application systems requiring the involvement of large numbers of researchers and users from different disciplines.

They include information and language engineering, information technology, high-performance networking and integrated customized systems, the contribution of ICT to functional integration in manufacturing, technologies for multimedia systems and information system security.

These technologies correspond to all or part of core themes 3 to 7 and 10 in the first working document.

The third area covers generic activities in support of many and varied end-uses. The technologies in question allow the integration of "intelligence" into networks, and also relate to digitalized video services, photonic switching and mobile communications.

They correspond to core theme 7 in the first working document.

The fourth area also covers generic IT activities, including the development of microelectronic technologies, particularly ASICs, open microprocessor systems, integrated microsystems and flat screens, and optimum use of software and distributed data processing (data bases, man-machine interface and open architectures).

These technologies correspond to all or part of core themes 1 to 4 in the first working document.

As regards the procedures for implementing the activities, a number of considerations must be taken into account:

- The projects should focus largely on a few major themes in order to avoid the dispersion noted in the past. This focusing should be accompanied by closer coordination of national and Community research activities. This approach will also ensure greater complementarity with EUREKA.
- In conjunction with technology promotion and better dissemination of technology, it will also enable SMEs to take part in better targeted clusters of projects and derive greater benefit from Community programmes.

- Users will be involved more closely since use of technologies is the best guarantee that they meet the needs of the market.
- The RTD activities in certain areas could use clusters of targeted projects accompanied and strengthened by networks of excellence, associations of suppliers and users, the coordination of national initiatives, international cooperation, special campaigns to disseminate the results, and training activities complementary to and coordinated with similar, more centralized schemes where necessary. These activities will combine targeted action, and hence selectiveness and efficient use of resources with the flexibility and responsiveness needed for the management of change.

Industrial Technologies

In view of the globalization of markets, the emergence of new competitors, the internationalization of the processes involved in the acquisition of new technologies, and the need to protect the environment more effectively, industry is obliged to adapt its structure and its cooperation and competition strategies.

In this context, the Community's technology strategy has an important role to play as a catalyst and in support of industry's initiatives and efforts since a combination of national and Community activities is essential in order to stimulate industry's capacity to develop new products and processes meeting the needs of consumers and of society in areas such as transport, habitat, health-care, environment, sustainable resource-management and working conditions.

In accordance with the Community's new industrial policy, Community activity should focus on areas of technology the applications of which will have a rapid impact in a sufficiently large field of industrial activities.

Against this background, the Community activities will aim at promoting multidisciplinary research, the development and application of generic technologies, multi-sectoral cooperation, interfaces between assemblers and subcontractors, links between industry and universities, research by and for SMEs, and training and education in an industrial context.

The activities will focus on the following four areas:

- Design, Engineering, and Systems Technologies and Technologies for Human-centred Organization of Production
- Advanced Propulsion Systems
- Materials and Materials Processing and Recycling Technologies
- Standardisation-related Research Measurement and Testing.

This reduced number of core thematic areas is based in whole or in part on core themes 10 to 14 and covers applications of technologies developed in core theme 6 and aspects relating to production technologies, materials, prenormative research, and propulsion technologies in the core themes concerning means of transport - road, air, rail and shipping (15), urban habitat (16), cultural heritage (17), and social exclusion (18).

Despite the high priority given to industrial technologies in the current context, it is possible to envisage a degree of focusing of the efforts within the core thematic areas. Wider use of (intensified) concerted activities wherever this suffices to secure the added value from the Community dimension should allow a more selective approach to shared-cost activities (focusing on strategic themes requiring a minimum critical mass or the sharing of risks on a European scale) without narrowing the range of themes proposed for action at Community level in the first working document.

The first two areas cover the technologies involved in the life cycle of materials and products, including applications of information and telecommunications technologies available. The activities will be aimed mainly at improving the quality, reliability and performance of materials and products, the flexibility of production, working conditions and the use made of human resources, more rational management of basic resources, greater recovery and recycling of materials, and a reduction in the product design and manufacturing cycle and in impact on the environment.

Efforts will be focused in particular on intelligent and computer-integrated design, engineering and manufacturing, rapid prototyping, new industrial applications for lasers, microsystem technologies, clean industrial processes such as biotreatment, collectors, advanced materials (superconductors, bio-materials, etc) and technologies needed for the emergence of new products, particularly in areas such as transport, the urban habitat and health-care.

The third area relates to the application and integration of generic technologies and the development of specific technologies needed for the development of advanced propulsion systems for more efficient, safer and cleaner means of (road, air, sea and rail) transport.

For the first three areas, flanking measures designed to optimize the impact of Community activities will be improved and strengthened: training schemes, action to encourage and facilitate the dissemination and utilization of results, appropriate specific procedures to encourage the involvement of SMEs ("technology promotion", CRAFT, feasibility awards) and industrial activities coordinated around a common objective such as the factory of the future, clean cars, etc., in order to facilitate the integration of technologies and the transfer of knowledge between projects and between sectors, and coordination with EUREKA.

The fourth research area covers technologies and methods of measurement and testing in the framework of prenormative research in support of Community policies or meeting the needs of society and industry.

The approach will have to be sufficiently flexible to cater for the changing needs of prenormative research activities, while complying with the established procedures and ensuring scientific and technical excellence. Integrated activities would be a particularly appropriate means of facilitating the development of measurement and testing by organizing networks of national laboratories.

The Joint Research Centre should make a specific contribution to this research as regards prenormative research on advanced materials and structural mechanics, and measurement and reference material.

Environment

The guidelines for research, particularly environmental research, reflect the need to expand the scientific and technical basis with a view to ensuring throughout the Community a harmonious and balanced development of economic activities, and sustainable and non-inflationary growth respecting the environment.

Consequently, the Community's research and technological development activities must support policy formulation and implementation in the many different fields covered by this objective. The Community's Fifth Action Programme on the Environment set the primary objective of moving towards sustainable development. Against this background, it set out a new strategy for addressing, on the basis of the sharing of responsibilities, activities which affect natural resources or damage the environment instead of waiting for problems to arise. The aim of the strategy is to alter trends and practices which are harmful to the environment in order to improve the quality of life and the socio-economic development of the present generation and of future generations by increasing the range of instruments for changing the behaviour of those concerned. In addition, the programme specifically addresses several priority problems and hazards which affect the Community as a whole and which must be resolved. They include climate change, acidification and quality of the air, protection of natural resources and biodiversity, water-resource management, the urban environment, coastal regions, waste treatment, industrial hazards, civil protection and urban disasters. To assess and manage complex environmental problems such as these a multidisciplinary approach is called for. A new approach is therefore appropriate, fully reflecting the political guidelines but also flexible enough to encourage interactions and allow proper attention to be paid to each specific field such as marine science and technology (including polar research) or climatology.

The two research areas are therefore as follows:

- Natural Environment, Environmental Quality and Global Change; and
- Innovative Environmental Protection Technologies.

The first area concerns the fundamental characteristics and processes governing the natural environment, including land, oceans and air, and how they are affected by human behaviour. Research on these subjects would be ideally suited for an integrated approach enabling the Community to make a major contribution to the worldwide action on global change. This applies in particular to modelling. Generally, Europe is expected to play a growing role in Earth observation activities. The Community must step up its action in this field, in conjunction with the space agencies. This is a typical example of a field in which the Joint Research Centre could make a significant contribution.

The second area covers the development of prevention, assessment, detection, environmental protection and restoration technologies. In this case, links will be established with EUREKA to ensure that the results of this environmental research yield their full potential in terms of the development of technologies and innovatory markets for European industry.

Core themes 19-22 proposed in the first working document plus the environmental technology aspects of core themes 16 (Urban Habitat), 17 (European Cultural Heritage) and 18 (Social Exclusion) will therefore be condensed into two areas.

Life Sciences and Technologies

The activities relating to life sciences and technologies are crucial for the future of the Community, this being a rapidly expanding field which is vital for the relevant common policies.

The benefits which they can bring for man and society are a priority in their own right. The Member States' capacities in this field vary widely, but many of them can rely on an internationally recognized scientific and technical base. Consequently, the Community must concentrate on themes which cannot be covered at other levels but in which the Community must hold its own against fierce international competition. Examples include the recent advances in molecular biology and determination of the genetic heritage.

Strong basic technological research is needed to offer a wide range of methods of tackling very different research problems. The aim of this integration activity will be to provide the infrastructure for combining the efforts of the many institutes involved, in interaction with the existing industrial focal points. The priorities for action by the Community include development of genome sequencing processes which are ideally suited for the establishment of European cooperation networks. An integrated European consortium could also be set up to bolster the Community's position in the field of molecular phylogenetics.

The arguments for greater investment in research into biomedicine and health are primarily of a social and economic nature. Rising costs in this field have become a major concern for every country, even the richest. At the same time, citizens in every Member State are demanding high-quality health-care. The wide diversity of public-health systems, and of causes of mortality and morbidity, in Europe, is an asset which must be tapped. Comparative epidemiology and research into the health services will provide a means of harnessing this diversity as a source of numerous research hypotheses. This approach will contribute to the prevention of major diseases such as cancer, cardiovascular disease, infectious diseases such as AIDS, neurological and mental illnesses and age-related or diet-related pathology.

Particular attention will be paid to the development of the scientific basis and the techniques necessary to evaluate new drugs for the treatment of neurological, psychiatric and immunological disorders and to participation in the Brain Decade, notably by the development of methodology, instrumentation and specialised infrastructure which are necessary for the study of the nervous system.

Primary production, whether from agriculture, horticulture, fisheries or forestry, supplies the raw materials to meet food and other needs. The reform of the common policies entails considerable changes. Research concerning agriculture, forestry, rural development, fisheries and aquaculture must *reflect these changes and address methods, techniques, production systems and products.*

Agro-industrial research must keep ahead of this trend and focus on methods of processing biological raw materials and increasing their added value while ensuring the safety of foodstuffs. It will provide feedstocks for fine chemistry, food ingredients and cosmetic and medicinal substances. Biotechnology in turn will underpin the development of this activity, interacting closely with other technologies, such as information technology and chemical engineering.

The activities will therefore be divided into three areas:

- General Biotechnology;
- Biomedicine, Health and Drugs;
- Application of Life Sciences and Technologies in Agriculture, Forestry, Rural Development, Agro-industry and Fisheries.

Energy

Community research, technological development and demonstration activities (RDD) in the energy field should be aimed at the development of clean and safe energy systems allowing the use of efficient technologies, guaranteeing compatibility between energy use and the equilibrium of the biosphere, including man and the environment.

The RDD effort to be undertaken covers non-nuclear energy, the safety of nuclear fission energy and controlled thermonuclear fusion.

Various RDD themes will be addressed, some reflecting the problems facing society and others reflecting political or economic developments. The various types of traditional energy sources (fossil, nuclear) and energy use projects with a view to reducing their (local, regional and global) environmental impact by improving energy efficiency, producing and using clean fossil fuels, minimizing emissions into the atmosphere (CO₂ and other pollutants such as SO₂ and NO_x) and improving the safety of the nuclear fuel cycle as a whole.

RDD into renewable energy sources and the use of such sources will make a direct contribution to this general objective while meeting the concerns with regard to diversification and the improvement of the security of energy supplies in the Community and the satisfaction of needs by appropriate local resources.

A suitable balance will be sought between the desire for more efficient supplies from conventional or renewable sources and the need for the Community to assume the responsibilities placed on it for the nuclear field by the Euratom Treaty. The Joint Research Centre will make a targeted contribution in each of these fields, particularly renewable energy sources.

The concerns underlying the Community policies on energy, of course, but also on agriculture will be an integral part of the procedure for defining the RDD priorities. The incorporation into the Fourth Framework Programme of energy demonstration activities (strictly linked to the development of new technologies) will also help to encourage cooperation between industrialists, operators and users on innovation projects which can be applied on a wider scale (in conjunction with EUREKA and various Community instruments) both in the Community and in third countries (including developing countries). The THERMIE programme, valid up to the 31st of December 1994 and being the continuation of the previous demonstration programmes, is an appropriate means to satisfy the need for Community demonstration activity in the energy field.

The advantages of taking action on each of these themes at Community level are well established, for example in the case of controlled thermonuclear fusion. However, the work on nuclear safety should focus particularly on research into the operation of nuclear reactors in Eastern Europe and in the CIS.

Core themes 32 to 35 in the first working document have now been compressed to three areas:

- **Technologies for Cleaner and More Efficient Production and Use of Energy;**
- **Nuclear Safety;**
- **Controlled Thermonuclear Fusion.**

Research for a European Transport Policy

Implementation of the Treaty on European Union will add fresh impetus to the common transport policy. For the first time, "Measures to Improve Transport Safety" are explicitly included in the list of objectives to be attained. The provisions on trans-European networks and on economic and social cohesion likewise provide the Community with a new basis for contributing to the establishment and development of transport infrastructure.

Against this background, transport will play a larger part in the Fourth Framework Programme for research and development, which will build on the experience gained and progress made in the earlier programmes and, as in the past, rely on the active participation of the private sector, the scientific community and the end-users.

The first objective of research for a European transport policy will be to support the development and integration of transport systems (in the context of sustainable development). It will place the emphasis on the complementary nature of the individual modes, will develop scenarios and conduct analyses at urban, rural, regional and trans-European level and explore the interrelationships between human factors and technology. Attention will also be paid to the strategic organizational and institutional aspects to ensure effective implementation of technological innovations and that their net impact is to produce more complementary, efficient methods suited to the needs of an integrated transport system and ensuring the competitiveness of industries in the sector in question.

This overall research strategy will take into account the objectives of European transport policy. It will be backed up by the activities carried out, within the major themes covered by the first activity, concerning research relating to industrial technologies and

data-communications services for transport. These activities will be stepped up as a result of a new specific research theme entitled:

- Research for a European Transport Policy.

Its objective is to contribute to the development and management of safer, more efficient and more environment-friendly transport systems. These research activities will focus on research of a strategic nature, in particular through the creation of appropriate models and scenarios relating to European transport flows, the evaluation of technical innovations and their impact on the performance and management of individual transport modes and their interoperability, interconnectibility and accessibility.

To verify the strategic parameters for implementing such innovations, particular emphasis will be placed on their validation with a view to applying them to transport systems. This will entail research into transport systems modelling, and the integration of instruments resulting from other research activities, in particular telematic and industrial research activities, into an overall transport system. Political and economic feasibility, social acceptability and human factors in an operational environment should also be explored.

Targeted Socio-economic Research

This new topic covers two types of work:

- evaluation of the options for European science and technology policy;
- research work in two specific areas: research into the problems and opportunities for European integration; and research on education and training.

Work to evaluate options for European science and technology policy is essential in order to update and enlarge the knowledge base available to decision makers who are responsible for research, technological development and demonstration projects policies in the Member States and at the Community level. Work will include strategic analyses, forecasting and technological evaluation needed to make available to decision makers (whether they have responsibilities at the executive level, legislative power or are simply responsible for research) reliable decision making tools such as long term scenarios, possible options for scientific and technology policy and expert reports prepared by users of RTD from the fields of industry, the scientific community and society in general. Such work must when necessary lead to the launching of preparatory actions and definition phases for new RTD actions planned by the Community (cf. Annexe IV).

The RTD work proposed in the other two areas cited correspond to developments in policies as shown in the new Treaty on European Union. Article 3 of this Treaty on European Union provides for a policy in the social sphere, the strengthening of economic

and social cohesion and a contribution to education and training of quality. Article 130f sets the Community's RTD activities the objectives of making Community industry more competitive and providing support for all the Community's other policies and activities.

It is necessary above all other things in a second area to support research which will provide an expandable knowledge base covering the common problems of society in Europe in the context of the integration and the diversity which will continue to increase after the application of the Treaty on European Union. Such research will be concentrated on specific problems of European society which need to be tackled in common by the Member States. The European dimension will allow maximum benefit to be drawn from the diversity of approaches taken at a national level and to strengthen research infrastructure (networks, databases, etc.). Social exclusion and city life are two of the biggest problems facing European society today. The work will cover understanding the mechanisms which lead to the exclusion of certain social groups from mainstream socio-economic life and the dissemination at a Europe wide level of examples of where groups have been successfully integrated. The contribution of technological developments to the resolution of such problems will be evaluated in the whole context of all means that have been tried out across the Community. The problem which is common to all Member States that is the complexity of urban life, the different methods of organising it and making it work will form a priority part of the work in this second area.

The third area covered by the research work addresses the methods, tools and systems of education and training and the introduction of new innovations in these areas (cf. Annexe IV). In order to give to those people already doing work in Europe in this field of education and training a reference framework and further to provide them with a solid base, research is necessary into the current state and the existing needs in this field, into the policies that are being followed, tools and methodologies, etc. as well as experimental projects in the different sectors concerned. The potential benefits are mainly at the European level, and the problems that must be addressed will require an interdisciplinary approach which will be easier to put into place using the various complementary resources present in the different countries, and it can not be disputed that undertaking such work at the Community level will lead to additional benefits.

This topic therefore covers three areas:

- research into the problems of social integration
- research on Education and Training;
- evaluation of Science and Technology Policy Options.

This entails reducing the number of core themes originally planned (16 and 18 under the first activity and the first, second and fourth core theme of the horizontal measures in the first working document) and to add new research areas concerning research on education and training and the evaluation of science and technology policy options (see Annex IV to this document).

In addition to this targeted socio-economic research, the Fourth Framework Programme outlines the economic and social research to be conducted within each main RTD theme (Evaluation of the Socio-economic Impact of Research) and under the fourth activity (Training and Mobility of Researchers in Economic and Social Sciences). This will lead to reconsidering the related core themes originally proposed under the third activity.

SECOND ACTIVITY

Promotion of Cooperation in Community Research, Technological Development and Demonstration with Third Countries and International Organizations

The background to Community R&TD policy is a world context in which there has been a considerable upturn in policy in this area in the United States and Japan. In the United States President Clinton recently presented his programme for economic growth which includes scientific, technological, industrial and educational initiatives; investment expenditure on policies in these areas should be considerably increased over the period 1993-98. In Japan, despite the current economic difficulties, the government has undertaken to continue and even step up the public research effort, especially in basic research and university research.

The objectives regarding this second activity are to strengthen Europe's scientific and technological capacity and to support the Community's policies on scientific and technological cooperation with third countries based on the principle of mutual benefit. Closer cooperation of this type will allow the Community greater access to the knowledge, know-how and research opportunities available in European countries - distinguished depending on whether it is with industrialised countries or with the countries of central and Eastern Europe and the CIS - non-European industrialized countries and developing countries. Article 130H of the Treaty serves as a reminder that there should be coherence between national research policies and those of the Community. And that any such coherence of policies must target both activities internal to the Community and those affecting the rest of the World, i.e. must include the field of cooperation with non EC countries. Through close cooperation with the Community programmes on development aid and economic restructuring, this will enable researchers in the Community to collaborate with scientists, technologists and industrialists in these other countries. In this way, better use can be made of the limited resources available to address scientific and technological questions of growing international importance, while at the same time contributing to economic development and to improving international relations.

Since the accent is on geographical areas, the activities will concentrate on three areas:

- Scientific and Technological Cooperation in Europe;
- Scientific and Technological Cooperation with Non-European Industrialized Countries;

- Scientific and Technological Cooperation with Developing Countries.

Compared with the second activity in the first working document, core themes 2, 4 and 5 have been combined into a single theme and the order has been slightly readjusted.

THIRD ACTIVITY

Dissemination and Application of the Results of Community Research, Technological Development and Demonstration Activities

European industry is generally less efficient than its rivals at turning research results into commercially viable products or processes. Securing a return on investment is becoming a critical factor in many industrial sectors. In addition, there are increasing signs of resistance where the social acceptability of science and technology is concerned.

To remedy this situation and taking into account developments in the United States and Japan, the Community must make a substantial contribution to improving the dissemination and utilization of research results and also to creating conditions to facilitate the transfer and take-up of new technologies, whatever their origin, by industry, and especially SMEs, while meeting the needs of society.

The centralized activities under the third activity must be coordinated with the dissemination and utilization activities in other activities.

The activities must take into consideration the fact that innovation is a complex, interactive process and that special skills and a multi-sectoral approach are needed for the transfer and utilization of technologies.

The activities to be carried out (and funded) within the specific programmes, the JRC programmes and the demonstration schemes are not described below.

The activities proposed at a centralized level are grouped together in the following three areas:

- dissemination and exploitation of results;
- transfer of technologies;
- financial environment of the transfer.
- scientific services for Community policies.

- 1) The first area covers all activities aimed at making greater use of, or establishing:
 - a European infrastructure for dissemination and utilization with the objectives of publicizing the Community's RTD activities, promoting scientific and technical cooperation and facilitating the application of research results in Europe, in particular by strengthening the European public information and dissemination service (CORDIS, OPET and other activities), and expanding the network of relay centres;
 - specialist services and direct assistance to promote transnational utilization of RTD results (including the JRC and EUREKA) which are targeted on SMEs in particular. They comprise assistance with the protection of results, help in the finding of industrial partners, market research, awareness-raising and training schemes, the establishment of technology associations, and support for projects on trans-sectoral applications.
 - strategic and interdisciplinary discussions about the effectiveness of the transfer of RTD results (acceptability and evaluation of social impact, management and communication of research, pilot communication projects).
- 2) The second area comprises all the activities aimed at making greater use of, or establishing a European infrastructure for the transfer of technologies.

Emphasis will be placed on improving the quality and efficiency of innovation support services and the take-up of new technologies by industry, and especially SMEs. This will be achieved by setting up networks and supporting transnational pilot projects, making firms aware of the best practices with regard to the management of technological resources, better knowledge of mechanisms and strengthening the coordination of policies and appropriate instruments. The network of OPETs (organizations for the promotion of new energy technologies) is a useful instrument for the energy sector.

- 3) The third area concerns the improvement of the European environment for funding technology transfer with the aid of indirect measures such as the establishment of links between the funders and owners of technological projects, continuation of the experimental system of performance-related funding of technology, support for the establishment of effective mechanisms for the mobilization of private capital and investment "exit", and analysis of the most appropriate legal structures and the promotion thereof. It also covers the establishment of a fund for technology take-up by SMEs. This instrument will be compatible with the arrangements set up by the Member States and will be adapted to the specific national situations. It will be managed and promoted on a decentralized basis, by public-sector or private-sector intermediaries in the individual Member States. It should be designed so as to

mobilize a maximum amount of resources from the financial intermediaries. The fund will cover loan guarantees, interest-rate subsidies, measures to encourage venture capital, and managerial and technical assistance activities.

4) Scientific Services for Community Policies

This theme covers the JRC's ad hoc scientific and technical support for Community policies. In practice, these measures concern dissemination of results of research conducted by the JRC for other Commission departments as its contribution to the formulation and implementation of Community's policies.

More formal, long-term support activities such as the action taken by the European Centre for the Validation of Alternative Methods now come under the first activity. The core theme included in the horizontal support measures in the first working document has been deleted.

FOURTH ACTIVITY

Stimulation of the Training and Mobility of Researchers in the Community

Stimulating the training and mobility of researchers is an essential means of strengthening, in accordance with the principle of subsidiarity, the scientific and technological system and hence the scientific and technological basis of European industry and its international competitiveness.

Training and mobility activities will be carried out within each theme of the first activity in order to provide users in priority areas for the Community not only the RTD results they need but also the human resources capable of utilizing them.

However, the European dimension should also be used to develop human resources making it possible to react in real time to scientific and technological developments in emerging areas. The fourth activity, addressing advanced training in centres of excellence throughout the Community will therefore be open in nature and will also focus on partnership between universities and industry.

This activity includes the following elements:

- Stimulation of Training and Mobility (in particular for young researchers through a Community bursary scheme);
- Promotion of the Mobility of Human Resources in Networks (constituting not only the logistic and operational basis for exchanges but also an important tool for developing the Community dimension of research).

Implementation of this activity will take into account, on the one hand, the situation within the Community through specific measures directed towards the least favoured regions in the context of the reform of structural policy, and, on the other, the situation outside the Community, in particular in EFTA and Central and Eastern European countries, through appropriate synergy with the action taken under the second activity.

The mobility of researchers, as producers of knowledge and know-how often with little pattern, are, as much as research itself, a critical variable in the transfer of technology. Increasing mobility between centres of research or universities and industry can therefore help improve competitiveness.

The following types of action are planned:

- Coordination of the training activities under each specific programme. This will entail harmonizing the schemes, finding solutions to problems common to all the programmes and, in particular, preparing a guide for European bursaries. Measures such as these will contribute to economic and social cohesion within the Community and will be particularly useful for small businesses with no training infrastructure of their own.
- Putting in place of training activities in basic research and in non targeted research (as opposed to that foreseen in the first activity) with the creation of "European laboratories without walls".
- Training in management of change in industry, through partnership between industry and higher education establishments, and oriented towards training in new technologies.
- Encouragement of new scientific and technological approaches. The basic aim is to promote transnational cooperation in basic research in order to develop, thanks to the European dimension, the human resources, materials and methods needed to respond, in real time, to new scientific and technological challenges as and when they emerge. Such cooperation is essential to allow the development of large and costly instruments and to enable them to be put at the disposition of all the researchers in the Community and to prepare advanced generic technologies which are essential for every Member State and which should be developed jointly in order to ensure interoperability.

These activities will be combined into the following area:

- **Training and Mobility of Young Research Scientists;**

it will replace the four core themes originally proposed.

ANNEX IV

EVALUATION OF SCIENCE AND TECHNOLOGY POLICY OPTIONS

Technology assessment in a European context covers a very wide range of interrelated activities: monitoring technological and economic developments, anticipating in the long, medium and short term the socio-economic changes that will dictate a shift of emphasis in RTD and, conversely, forecasting the scientific and technological changes which are likely to have a short, medium or long-term impact on society; analysis of the behaviour patterns of the various players involved (governments, social forces, researchers and institutions) in the face of these changes; evaluation of programmes and policies at national, regional, European and international level; relevance of trends in Community policy to the future of RTD activities in Europe.

The United States recognized the importance of these issues more than twenty years ago, and its Office of Technology Assessment has since acquired an international reputation. Similarly, Japan set up the National Institute of Science and Technology Policy to carry out studies of this type. In Europe, technology assessment activities have developed very rapidly over the past decade and have been institutionalized at both national and European level (Science and Technology Options Assessment, European Parliamentary Technology Assessment Network).

The Commission's departments have built up a great deal of practical experience over the years through the Monitor (FAST, SAST, Spear), JRC (Institute for Prospective Technological Studies) and Value and EUROSTAT's programmes. Managers of specific programmes have themselves gained a wealth of experience assessing the socio-economic impact of research in their fields as specified in a decision taken when the Third Framework Programme was approved.

This new approach therefore entails including a new area "Evaluation of Science and Technology Policy Options" as follows:

The aim is to make available to the parties involved, decision-makers and users of RTD, a European instrument for evaluating science and technology policy options and, with that in mind, to bring together the various strands of activity at regional, national and European level in the fields of forecasting, technological and strategic monitoring and assessment of RTD programmes and policies. By putting in place a limited number of dedicated networks, a technology monitoring system, concertation and study activities, support activities (open data bases, lists of indicators, directories of technology assessment in Europe, etc.) and by the dissemination of information through workshops, seminars, information weeks, etc., it will be possible to offer those involved in technology assessment in Europe a pluralistic framework for dialogue and for comparing approaches, leading to the formulation of science and technology policy options for Europe which can be used by RTD operators, decision-makers and users. That is why the proposed activities will be carried out in close collaboration with parliamentary science and technology assessment agencies at national and European level (in particular

STOA and the European Parliamentary Technology Assessment Network), national and regional public TA bodies, the existing teams of research scientists and social partners. A limited cluster of activities should be organized so as to launch preparatory activities, definition phases for new RTD Community actions. Analyses of socio-economic impact and the risks involved in the specific programmes will continue.

FINANCIAL STATEMENT

Part I: Financial implications

1. TITLE OF THE OPERATION

Fourth Framework Programme of Community activities in the field of research and technological development (1994-98)

2. BUDGET HEADING CONCERNED

Sub-section B6

3. LEGAL BASIS

Article 130i of the EEC Treaty and of the Treaty on European Union as signed, and Article 7 of the EAEC Treaty

4. DESCRIPTION OF THE OPERATION

4.1 Specific objectives

Implementation of research, technological development and demonstration programmes by promoting cooperation with and between enterprises, research centres and universities;

Promotion of cooperation in the field of Community research, technological development and demonstration with third countries and international organizations;

Dissemination and application of results of Community research, technological development and demonstration activities;

Stimulation of the training and mobility of researchers in the Community.

4.2 Duration

1994-98

4.3 Target population for the operation

Industrial enterprises - including specifically SMEs - research centres and universities in their research and technological development activities.

5. CLASSIFICATION OF THE EXPENDITURE AND REVENUE

5.1 Non-compulsory expenditure.

5.2 Differentiated appropriations.

5.3 Type of revenue involved

The EFTA countries as defined in Article 2 of the Protocol amending the Agreement on the European Economic Area (EEA) will contribute to proportional additional financing for this framework programme, if the EEA Joint Committee provided for in the Agreement so decides, probably limited to the non-nuclear activities.

6. TYPE OF EXPENDITURE OR REVENUE

Research and development projects carried out by external contractors can come under one of the following three forms of Community financial participation:

- participation in research costs, within a ceiling of 50% of costs. This participation may be determined on the basis of conventional costs negotiated in advance. As regards universities and similar organizations, they will have the possibility of requesting either funding of 50% of the overall costs or funding of 100% of additional costs.
- in the case of projects of a specifically industrial nature (demonstrations, prototypes, etc.), contribution, linked to the research results, of a predetermined amount within ceilings determined by the Community for this type of project.
- payment of a flat-rate contribution for small-scale projects not exceeding a ceiling set for each specific programme.

Concerted actions, which consist of the co-ordination of research and development projects, may receive a contribution of up to 100% of the cost of the concertation.

Research activities carried out by the Joint Research Centre will, in principle, be fully funded.

FINANCIAL IMPACT

Method of calculating the total cost of the operation

The Framework Programme has been defined so as not to exceed two-thirds of the amount allocated to category 3 of the financial perspective for 1994-99.

This is in accordance with Article 150f of the Treaty on European Union which states that the Framework Programme determines the amount deemed necessary (maximum overall amount in the Treaty) together with its distribution between the activities envisaged.

The amounts will cover scientific, technical, demonstration and related horizontal support measures as well as personnel costs and administrative, scientific and technical expenses directly linked to the execution of the activities and measures. As far as activities carried out by the JRC are concerned, these amounts will cover the infrastructure for the institutes.

7.2 Breakdown

The four activities correspond to the four objectives listed at 4.1 above.

4th FRAMEWORK PROGRAMME 1994-98	
	MECU (current prices)
First Activity (Research, Technological Development and Demonstration Programmes)	10925
Second Activity (Cooperation with Third Countries and International Organizations)	790
Third Activity (Dissemination and Application of Results)	600
Fourth Activity (Stimulation of the Training and Mobility of Researchers)	785
MAXIMUM OVERALL AMOUNT	13100

MECU
(current prices)

Indicative breakdown between themes in the first activity

- Information and Communications Technologies	3900
- Industrial Technologies *	1800
- Environment *	970
- Life Sciences and Technologies *	1525
- Energy *	2525
- Research for a European transport policy	280
- Targetted Socio-economic Research *	125
	<hr/>
	10925
	<hr/>

of which JRC 1067 MECU. N.B.: in addition to participating in the first activity the JRC will also participate in the third activity to the tune of 70 MECU.

MECU - current Prices

YEARS	Financial Perspectives	Actual Amounts 4th FP
1994	4325	pm
1995	4715	2928
1996	5078	3153
1997	5450	3384
1998	5852	3635
Total 1994-1998		13100

The definitive yearly amounts will be determined by the budgetary authority in accordance with the financial perspective agreed for 1993-99.

8. ANTI-FRAUD MEASURES PLANNED UNDER THE OPERATION

Audit programme of the Directorate-General. Supervision by the officials formally responsible for the actions.

Part 2 : Basis for cost/effectiveness analysis

1. OBJECTIVES

The Framework Programme corresponds to the objectives established by the Treaty on European Union and notably its Article 130f(1) which states: "The Community shall have the objective of strengthening the scientific and technological bases of Community industry and encouraging it to become more competitive at international level, while promoting all the research activities deemed necessary by virtue of other chapters of this Treaty." The four activities selected reflect Article 130g.

2. JUSTIFICATION OF THE OPERATION

The operation is justified by the need for the Community to help strengthen the scientific and technological bases of Community industry and to encourage it to become more competitive at international level, while contributing to the definition and implementation of Community policies and to meeting the needs of society.

An analysis of the consequences in the research area of the central role played in Community action by the principle of subsidiarity, in the terms of the decisions adopted at Maastricht, has been carried out. This has made it possible to highlight a number of cases where the principle of subsidiarity applies in an intrinsic fashion: 'big science' activities; technology priority projects; RTD activities aimed at organizing the single market; prenormative research; activities in support of the European scientific community.

3. MONITORING AND EVALUATION OF THE OPERATION

The form and frequency of the process of evaluation will be such as to enable the Commission to respond to the requirements under Article 4 of the draft Decisions in the proposal above, and to evaluate Community RTD programmes and policies.

The principal factors of uncertainty which can affect the results of the operation include any delay which may occur in the implementation of activities under the present proposal, the ability and readiness of private enterprises to take full advantage of the benefits which these activities will offer them, and the unavoidable difficulty in making a direct link, especially in the short term, between research expenditure on the one hand and industry's competitive success on the other, notably in the light of the fact that innovation is not a linear process from fundamental research, through applied research to commercial application.

The indicators and quantitative or qualitative criteria which make it possible to measure the results will be determined at the level of each specific programme.

During the period of implementation of the Fourth Framework Programme, the Commission will examine the state of its progress in relation to indicators. It will assess, in particular, if the objectives, the priorities as well as the financial means are still adapted to the changing situation (see Article 4(1) of the draft Decision). After the completion of the implementation of the Fourth Framework Programme, the Commission will undertake an evaluation of it (see Article 4(3) of the draft Decision).

THE IMPACT OF THE PROPOSAL ON BUSINESS
WITH SPECIAL REFERENCE TO SMALL AND MEDIUM-SIZED
ENTERPRISES (SMEs)

Title of proposal: Second Commission working document concerning the Fourth Framework Programme of Community activities in the field of research and technological development (1994-98)

Reference number:

The proposal

1. *Taking account of the principle of subsidiarity, why is Community legislation necessary in this area and what are its main aims ?*

The objectives of the Community's research and technological development activities are to strengthen the scientific and technological bases of Community industry and to encourage it to become more competitive at international level. The need for Community action is acknowledged by Title VI of the EEC Treaty and by Chapter I of the Euratom Treaty. In addition, Article 130f of the Treaty on European Union stipulates that the Community shall promote all the research activities deemed necessary by virtue of other Chapters of the same Treaty. The approach described in Article 3b of the Treaty on European Union dictates that the Community's RTD activities must be subsidiary.

The impact on business

2. *Who will be affected by the proposal ?*

- *Which sectors of business ?*

The Community's RTD activities must concentrate more on generic technologies for widespread use in all sectors of economic activity in Europe. The joint research funded by the budget allocated to the Fourth Framework Programme on, for example, information technologies, industrial technologies, materials or biotechnology will affect very many sectors.

- *Which sizes of business (what is the proportion of small and medium-sized firms)?*

The Community encourages RTD and cooperation by businesses, including SMEs, research centres and universities. The complementarity between the comparative advantages of small firms and big

Community has prompted the Commission successfully to encourage small firms to become involved in the Community's research programmes, notably with the aid of special incentives. SMEs have also benefited most from the improvements made to the management of Community research, e.g. simplification of the information packages, support in seeking partners and targeted proposer days, etc. The Fourth Framework Programme expands this approach by providing for technology promotion activities for SMEs, by focusing the dissemination measures on small firms and proposing a completely new financial instrument specially designed to encourage SMEs to apply the results of Community research. This instrument forms part of the third activity and is a new addition to the package of measures designed to ensure more effective participation by SMEs in the Community's RTD activities.

- *Are there particular geographical areas of the Community where these businesses are found ?*

In principle, the Community's RTD activities serve no geographical or regional objective. Although the objective of strengthening economic and social cohesion in the Community and of promoting harmonious development also apply to RTD policy, scientific and technical excellence is the overriding selection criterion applied for this particular policy. This criterion in itself is a factor encouraging cohesion in so far as it enables scientists from the least favoured regions to participate in the most advanced research activities in Europe. The evaluation panel's September 1991 report on the impact of the Framework Programme on economic and social cohesion in the Community revealed increasing involvement by firms from the least favoured regions (most of them SMEs) in the Community partnerships. The Fourth Framework Programme should help to continue this trend, building on the results of the operations carried out under the Structural Funds (and in particular STRIDE) to bolster RTD structures in the least favoured regions. Specific measures for the "Objective 1" regions (as defined by the Structural Funds) are also planned under the third and fourth activities.

3. *What will business have to do to comply with the proposal ?*

The proposal imposes no formal obligations on businesses in the Community. On the contrary, it provides them with greater means to participate in joint research. The private sector will retain primarily responsibility for fully seizing the opportunities opened up and for applying the results of the research projects for the manufacture and successful marketing of innovatory products.

4. *What economic effects is the proposal likely to have ?*

- *on employment, on investment and the creation of new businesses and on the competitive position of businesses ?*

By making European businesses more competitive at international level, the Community's RTD activities will create jobs and encourage investment. The Commission communication evaluating the Second Framework Programme for Community research and technological development (SEC(92)675 of 22 April 1992) and the subsequent analysis of this evaluation by CREST give an idea of the economic impact of the Community's RTD activities. The proposed Fourth Framework

programme follows the concentration strategy started in the third. More selective allocation of the funds requested for the individual activities should ensure that the activities have greater relevance and impact.

5. *Does the proposal contain measures to take account of the specific situation of small and medium-sized firms (reduced or different requirements, etc.) ?*

Arrangements specifically for small firms will continue to be developed and, in certain cases, tested. New rules have also been proposed (cf. paragraph 2 above).

Consultation

6. *List the organizations which have been consulted about the proposal and outline their main views.*

This second working document on the Fourth Framework Programme is the fruit of a policy debate within the Commission, which keeps in constant contact with the advisory bodies responsible for RTD (CREST, IRDAC and CODEST), the European Parliament and the Economic and Social Committee, UNICE, the national authorities, researchers and the relevant European and national organizations.

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- RECHERCHE -

Luxembourg, le 29 avril 1993

Président : M. Svend BERGSTEIN,

Ministre de la Recherche et de la
Technologie du Royaume de Danemark

Les Gouvernements des Etats membres et la Commission des Communautés européennes étaient représentés comme suit :

Pour la Belgique :

M. Jean-Maurice DEHOUSSE Ministre de la Politique scientifique et des Institutions scientifiques et culturelles

Pour le Danemark :

M. Svend BERGSTEIN Ministre de de la Recherche et de la Technologie

M. Knud LARSEN,

Secrétaire d'Etat à la Recherche et à la Technologie

Pour l'Allemagne :

M. Matthias WISSMANN Ministre fédéral de la Recherche et de la Technologie

Pour la Grèce :

M. Georges PENELIS Secrétaire Général au Ministère de la Recherche

Pour l'Espagne :

M. Elias FERERES Secrétaire d'Etat aux Universités et à la Recherche

Pour la France :

M. François FILLON Ministre de l'Enseignement supérieur et de la Recherche

Pour l'Irlande :

M. Eamonn RYAN Représentant permanent adjoint

Pour l'Italie :

M. Rocco Antonio CANGELOSI Représentant permanent adjoint

Pour le Luxembourg :

M. Marc FISCHBACH Ministre de l'Education nationale

Pour les Pays-Bas :

M. J.E. ANDRIESSEN Ministre des Affaires économiques

Pour le Portugal :

M. Luis VALENTE DE OLIVEIRA Ministre de la Planification et de l'Administration du Territoire
M. Manuel FERNANDES THOMAZ Secrétaire d'Etat, chargé de la Science et de la Technologie

Pour le Royaume-Uni :

M. David DURIE Représentant permanent adjoint

Pour la Commission :

M. Martin BANGEMANN Membre

M. Antonio RUBERTI Membre

FOURTH FRAMEWORK PROGRAMME OF COMMUNITY ACTIVITIES IN THE
FIELD OF RESEARCH AND TECHNOLOGICAL DEVELOPMENT - COUNCIL
CONCLUSIONS

Further to its discussion at its meetings of April, October and December 1992, and taking into account new elements, in particular the conclusions of the European Council in Edinburgh, the Council has continued its examination of the working document of the Commission on the fourth Framework Programme for Community actions of research and technological development. In the light of these discussions and without prejudice to further study of the second working document of the Commission and any other new information which might be made available, the Council has reached the following conclusions:

I. OBJECTIVES

The Council considers that, in order to create a prosperous Community based on industrial competitiveness, quality of life and sustainable development, Community actions under the fourth Framework Programme must have as their objectives to strengthen the scientific and technological basis of Community industry and its international competitiveness while promoting all the research activities deemed necessary for the implementation of Community policies.

The Council agrees that:

1. all activities must be of high scientific and technological quality;
2. attention shall be paid to the contribution which the Framework Programme should make to the promotion of social and economic cohesion;

3. Community support for RTD should continue to focus on generic, precompetitive research, and be of multisectoral application;
4. coordination between national RTD programmes and between national and Community RTD programmes as well as dissemination of results to enterprises, in particular SMEs, should be improved;
5. the content of the Fourth Framework Programme should ensure the necessary continuity of Community RTD and its further development, building on the experience of the second and third Framework Programmes and taking into account the need to ensure greater efficiency and added value, in particular through concentration, selectivity and the application of the subsidiarity principle;
6. the fourth Framework Programme should promote the development of standards across the Community to strengthen the single market and thus influence the development of world standards.

II. STRUCTURE

The Council agrees that:

1. a certain concentration and consolidation of themes covered by the four activities in Article 130G of the Treaty into a limited number of lines or programmes is necessary; at this stage the Council considers that a number of 15-20 lines or programmes could be appropriate;
2. notwithstanding decisions to be taken at a later stage on the number and content of specific programmes on the basis of proposals from the Commission, the Council considers that the following areas -

which are included in the Commission's second working document - could constitute the basic lines of the first activity of the fourth Framework Programme:

- Information technologies
- Communications technologies
- Telematics
- Industrial and materials technologies
- Measurement and testing
- Environment and Climate
- Marine research and technologies
- Biomedicine and Health
- Biotechnology
- Agriculture (including agro-industries, food technologies, forestry, rural development) and fisheries
- Non-nuclear energy
- Nuclear fission safety
- Thermonuclear fusion
- Transport-related research
- Socio-economic research;

3. given their importance for the effective implementation of the Framework Programme, international co-operation, dissemination and optimization of results and training and mobility, which constitute separate activities under Article 130G of the Treaty, should also be incorporated, where appropriate and subject to the definition of the necessary budgetary and administrative arrangements, in the specific programmes under the first activity.

III. FINANCIAL PERSPECTIVES

The Council agrees that, taking into account that, in the future, all Community RTD activities should be included in the Framework Programme, the total amount for the fourth Framework Programme should, in accordance with the conclusions of the European Council in Edinburgh, be consistent with the overall development of expenditure on internal policies and should at least broadly allow for maintaining the global Community RTD effort at the present level;

IV. INTERNATIONAL COOPERATION

The Council agrees that:

1. cooperation in scientific and technological research between the European Community and third countries should in principle be undertaken on the basis of mutual advantage, and taking into account, on the basis of the subsidiarity principle, international cooperation activities of the Member States;
2. increased participation in the Framework Programme by EFTA countries, inter alia through the EEA Agreement, could bring significant added value to the European research effort;
3. particular attention should be paid to cooperation in science and technology with countries of Central and Eastern Europe and the NIS of the former Soviet Union, with a view to preserving their considerable scientific potential;

4. particular attention should also be paid to scientific and technological cooperation with developing countries so as to reflect their respective priorities, develop their capacities for research and maximise the resulting benefits for their social and economic development;
5. scientific and technological cooperation with non-European industrialised third countries should respect the principle of no exchange of funds, ensure a balance of benefits and contribute to achieving more cost-effectively the objectives of the Framework Programme;
6. EUREKA should remain the principal vehicle for supporting research activities which are nearer to the market and the Commission should bring forward proposals to improve the synergy between the Community's research activities and EUREKA;
7. synergy with activities of other international organisations should also be improved;
8. COST should continue to play an important, specific and complementary role by promoting scientific and technological cooperation in Europe through multilateral research projects.

V. IMPLEMENTATION

The Council agrees that:

1. the fourth Framework Programme should have a duration of five years, ensuring continuity in the Community's RTD programmes;
2. detailed criteria and mechanisms should be established for cost-effective implementation and improved management of the Framework Programme in order to ensure that its objectives are fully met;
3. emphasis should be put on the improvement of procedures for independent and timely evaluation of the Framework Programme and on the definition of mechanisms for independent and systematic evaluation of actions undertaken in order to assess whether changes are necessary and to ensure proper support for policy choices and programme development;
4. shared cost actions should continue to constitute the main means of implementation of the Framework Programme. Bearing in mind the resources available and depending on the type of research activity, concerted actions, could, however, play a greater role, thus contributing inter alia to better coordination between national research efforts. Direct action, to be carried out by the JRC, will continue to play its part in areas where it can contribute efficiently;
5. mechanisms should be sought with a view to facilitating access to results and increasing effective participation of SMEs from all regions of the Community.

VI. PROCEDURE

The Council:

- reiterates its request to the Commission to present its proposal for the fourth Framework Programme as soon as possible;
- recalls that at the Council meeting on 9 December 1992, the Commission undertook to present a document on management of Community RTD programmes by 31 March 1993. Invites the Commission to make this document available without further delay. It further recalls that the Commission has undertaken to present a document on RTD policy and cohesion;
- invites the Presidency to continue contacts with the European Parliament with a view to facilitating subsequent agreement on the Commission's proposal;
- agrees that work should be intensified, concentrating in particular on a full examination of the second working document from the Commission, with a view to achieving fuller political agreement on the fourth Framework Programme at the Council meeting in June.

DECISION DIVERSE DANS LE DOMAINE DE L'EDUCATION - TEMPUS II

Le Conseil a arrêté la décision portant adoption de la deuxième phase du programme transeuropéen de coopération pour l'enseignement supérieur (TEMPUS II) (1994-1998).

TEMPUS II, adoptée pour une période de quatre ans à partir du 1er juillet 1994 concerne les pays d'Europe centrale et orientale désignés comme éligibles à l'aide économique par le règlement n° 3906/89 (programme PHARE), ainsi que les républiques de l'ancienne Union soviétique visées dans le règlement (CEE, EURATOM) n° 2157/91 (programme TACIS). Sur la base d'une évaluation de la situation propre à chaque pays, la Commission, conformément aux procédures prévues dans les règlements précités, détermine, en accord avec les pays éligibles concernés, s'ils devraient commencer à participer à TEMPUS II, ainsi que la portée générale et la nature de leur participation dans le cadre de la planification nationale de l'aide communautaire aux réformes sociales et économiques.

Les objectifs de TEMPUS II consistent à promouvoir, dans le cadre des orientations et objectifs généraux des programmes PHARE et TACIS dans le cadre de réforme économique et sociale, le développement des systèmes d'enseignement supérieur dans les pays éligibles par une coopération aussi équilibrée que possible, avec des partenaires de tous les Etats membres de la Communauté. Plus précisément, TEMPUS II est destiné à aider les systèmes d'enseignement supérieur des pays éligibles à aborder :

- a) les questions relatives au développement et au remaniement des programmes d'enseignement dans les domaines prioritaires ;
- b) la réforme des structures et établissements d'enseignement supérieur et de leur gestion ;
- c) le développement de la formation qualifiante en vue de pallier l'insuffisance des compétences de niveau supérieur adaptées à la période de réforme économique, en particulier par une amélioration et un accroissement des liens avec l'industrie.

La décision prévoit que la Commission présente, avant le 30 avril 1996, un rapport intermédiaire assorti d'une éventuelle proposition de prolongation ou d'adaptation de TEMPUS pour la période commençant le 1er juillet 1988 et un rapport final le 30 juin 1999 au plus tard.

DRAFT

I.E.T.T. SPEECH - LONDON 6TH JULY 1993

EC INDUSTRIAL POLICY:
ELEMENTS FOR MARKET-BASED AND PROACTIVE APPROACH

BY MICHEL CATINAT

INDUSTRIAL POLICY: A NEW POLITICAL AND LEGAL CONCEPT

Industrial policy has traditionally been a controversial concept, particularly within the European Community:

for some, industrial policy is the worst type of state intervention,

for others, it is the sole means to prevent our enterprises from being swamped by "unfair" competition and to achieve a minimal level of coherence in economic development.

In 1990, a very important political step was made when the Council of Ministers unanimously endorsed the Commission's communication on "Industrial policy in an open and competitive environment" [1]. This Communication mainly aims at clarifying the concept of a modern industrial policy for the Community in the present global competitive environment. As explained in the Communication, several reasons militated in favour of such a clarification: (i) European Community economies have undergone major structural transformations and much remains to be done, (ii) future industrial competitiveness will increasingly be determined by the ability to confront global challenges, in particular competition from major world partners, (iii) with the

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completion of the internal market, the replies to problems of industrial competitiveness must be sought increasingly at the Community level.

This Communication was followed by various other communications or Council resolutions which applied its principles to different domains, identified issues at stake and proposed measures to improve the European industrial situation. It is, in particular the case of the communications on the European electronics and information technology industry of April 1991 [2] or on telecommunication equipment of July 1992 [3]. These communications paved the way for a technology policy proposing a set of coherent and coordinated actions in five areas: stimulating demand, mastering technology, training, enhancing external relations and improving the business environment.

This political willingness to implement a new Community industrial policy legally materialised in the Treaty on European Union. For the first time, the public authorities explicitly recognised their responsibilities regarding industrial development at Community level.

The Treaty on European Union includes industrial competitiveness in the fundamental objectives of the Community:

Title XIII - "Industry", which stipulates that "The Community and the Member States shall ensure that the conditions necessary for the competitiveness of the Community's industry exist".

Title XV - "Research and Technological Development", which states that "The Community shall have the objective of strengthening the scientific and technological bases of Community industry and encouraging it to become more competitive at international level". Article 130f reinforces the industrial vocation of the R&D Community Framework Programme and groups together all R&D actions necessary to support the other common policies. The Community R&D policy becomes an instrument for the benefit of other Community policies, in particular the industrial policy.

Title VIII - "Social policy", which established a European Social Fund* with the objective of "facilitating adaptation to industrial change and to changes in production systems, in particular through vocational training and retraining".

Title XII - "Trans-European Networks", which aims at "deriving full benefit from the setting-up of an area without internal frontiers" and providing Europe with the infrastructure networks necessary for its competitiveness.

These policy developments have attracted a lot of attention, and at the same time given rise to suspicions about the real objectives behind them, given the deterioration of the industrial situation and the relatively bleak short term outlook.

WHICH INDUSTRIAL POLICY FOR THE EC ?

The Treaty does give rise to a number of fundamental questions about industrial policy and its instruments:

Firstly, what methods, instruments and means should be employed to implement the approach adopted?

Secondly, how will the Community's industrial policy respond specifically to the accelerated industrial change affecting our industries, and in particular to the very serious problems they currently face?

Thirdly, on which industrial policy issues will the Member States coordinate action? Subsidiarity will apply in order to differentiate between those matters best dealt with at Community level and those best dealt with at national level.

I will address these different questions, first conceptually and then through concrete examples.

Concerning the methods, the industrial policy approach which was agreed in 1990, is based on 4 principles:

- An effective industrial policy requires a coherent approach to all policies which impact on industrial activity.

Answering this question exhaustively is premature before the complete ratification of the Treaty on European Union which will provide the Community with a legal basis for its actions. On the other hand, some orientations of some Community policies are noteworthy with the aim of better taking into account industrial dimensions. They give some indication on how the Community would proceed, and why. I will illustrate them with the cases of both R&D Community policy and Trans-European information infrastructures. Both have been identified as priorities for the "economic revival of Europe" by President J. Delors during the Copenhagen European Summit of June 1993. On that basis, the European Council has mandated the Commission to present a White paper on the medium-term strategy to be followed to improve growth, competitiveness and employment in Europe.

THE R&D POLICY: INSTRUMENT OF THE INDUSTRIAL POLICY

The first application of the new concept of industrial policy concerns the information and communication technologies (ITC) area. On the basis of a precise economic analysis of the European industrial strengths and weaknesses, in the field of information and communication technologies, the following statements have been made:

1. the sharp increase in the cost of R&D, its increasingly multidisciplinary nature and the objective assessment of the European S&T situation prevent or make illusive any attempt to master all emerging technologies in Europe. In other words, selectivity in priorities and concentration in actions are necessary for the Community RTD policy to be credible and successful.
2. with the globalisation, the world is becoming more and more interdependent.
3. the factors of competitiveness are becoming more and more complex; in addition to access and mastering of technologies, other factors have to be considered concerning production, sales, finance and organisation of companies.

4. a balance between competition and cooperation has to be sought ; this balance is at the core of the strategies of the globalised companies.
5. access to technologies is as essential as developing technologies, if not more, in particular for SMEs.

These statements apply to most of S&T domains of the Community Framework Programme.

They lead to some clear conclusions which have been taken into account in the proposal for the Fourth Framework Programme. The Community actions to promote RTD have to be accompanied by other actions aiming at strengthening their societal and industrial impacts. First the Community Framework Programme has to be regarded as a package of coherent and complementary activities ; it consists, in a balanced way, of RTD and demonstration programmes, but also of cooperation with third countries and international organisations, dissemination and application of results, and stimulation of the training and mobility of researchers. Secondly, all those activities developed in the Framework Programme have to be conceived from the very outset in coherence and synergy with a more complete industrial policy.

What does it mean concretely ?

A relatively increased priority is given to the promotion of cooperation with third countries and international organisations (the so-called second activity of the Fourth Framework Programme). The EFTA countries will participate in the 3rd then the 4th Framework Programme according to the EEA Agreement. Beyond EFTA countries, cooperation will continue to develop on three fronts: the non-European industrialised nations, the countries of Central and Eastern Europe and the developing countries. Alongside the development, within the framework of bilateral agreements, of information exchange, joint research activities of mutual interest and exchange of researchers, cooperation with the industrialised nations will be complemented by Community participation in multilateral initiatives and in collaboration on mega-projects on a global scale.

or infrastructure policy, preserving the worldwide competition by encouraging more economic diversity and pluralism or by ensuring fair access to high technologies. These different goals are or will be sought through the implementation of the Community industrial policy.

Regarding the instruments, two points need to be stressed:

- in the first place, the impact and the effectiveness of industrial policy instruments have changed profoundly over the last few years and this affects the approach that needs to be taken;
- secondly, future industrial policy will increasingly have to be based on a combination of many different instruments even if they are sometimes difficult to reconcile because they have different objectives

Schematically, there are 3 categories of instruments which can be identified:

- those which are less effective than in the past, or where their application is becoming more difficult: notably tariff protection, quantitative restrictions, state subsidies and certain aspects of multilateral negotiations which are being undermined by bilateral agreements;
- those which remain useful: regional aid, R&D aid, SME support, support for the development of infrastructure, and instruments to improve access to markets and their functioning, such as merger control, restrictions on abuse of dominant position, liberalisation, certification and standardisation, etc.
- those which need to be enhanced: support for professional training, international competition rules, international industrial cooperation between enterprises, intellectual property rights, international investment agreements, etc.

On the basis of that method and those instruments, what could be the Community's priorities for industrial policy, in particular to respond to the accelerated industrial change ?

- Positive adjustment has to be the objective of any public intervention.
- The role of the authorities is above all a catalyst and pathbreaker for innovation. The main responsibility for industrial competitiveness must lie with firms themselves, but they should be able to expect from public authorities clear and predictable conditions for their activities.
- The improvement of the functioning of markets is a prerequisite for improving industrial competitiveness.

On this last point, I wish to argue that there is no contradiction between industrial policy and competition policy. Here I will mainly refer to a recent synthetic paper written by Peter Holmes, Sussex European Institute [4]. There is no contradiction for essentially two reasons.

The first reason is political. The Community and all Member States are committed to accepting that their industrial policies will be governed by the competition rules of the Treaty of Rome. Competition policy plays a central role in the EC system and aims at the overall maintenance of competition, but also at the preservation of the level playing field (the promotion of "balanced trade and fair competition"). The way industrial policy is defined in the Treaty on European Union and in the Communications released by the Commission is consistent with the competition policy. Its philosophy reflects a "pro-competitive" approach and stresses the importance of the environment in which firms operate. The coordination of different actions to make them coherent, consistent and positively complementary will play a central role in the Community industrial policy.

The second reason for which industrial and competition policies do not present any contradictions is economic. There is a large consensus to recognise the existence of a lot of market failures. The role of industrial policy is to correct them, and to enable the European companies to gain competitive advantage. Different examples have been given by economists: exploiting "first movers" advantage where R&D is important, and "second movers" advantage where imitation is easy, influencing behaviour and capability by education, training, R&D

A relatively increased priority is also given to dissemination and application of R&D results (the so-called third activity of the fourth Framework Programme). In order to reach all European local areas and innovative companies, the subsidiarity principle has to fully apply. For that reason, this activity in the Framework Programme is mainly based on coordination and setting-up of European infrastructures and networks. European public information and dissemination services (CORDIS, in particular) and the network of relay centres (VALUE) will be expanded. The take-up of new technologies by industry will be achieved by supporting transnational pilot projects, making firms aware of the best practices, and improving the European environment for funding technology transfer. The SPRINT programme will be reinforced.

Finally, it means that the interface between the Framework Programme and the Community industrial policy will be reinforced through different actions.

Let me take the example of Information and Communication Technologies (ITC).

Upstream, an activity of **analysis of technological and industrial evolutions** is being developed. Its mandate may be summarized as follows: continuously take note of the development of technologies, understand their industrial and social impact, strengthen the dialogue between interested parties, warn decisions-makers of what is at stake and make priority proposals. Its proposals consist, in most cases, in a set of actions, some in the field of R&D, others in the field of industrial policy, all reinforcing each other. Such recommendations bridging the technological and industrial spheres are for example necessary in the domain of multimedia, where the development of the market necessitates, beyond R&D, improvements in standardisation and intellectual property rights, and stimulation of "Titles" (e.g. multimedia applications). Different reports issued from this activity are already available (multimedia, product software, client-server architectures, etc.). The conceptual similarity with the recent UK White Paper "Realising our potential / A Strategy for Science, Engineering and Technology" is obvious: "Technology foresight, jointly conducted by industry and the science and engineering communities, will be used to

inform Governments decisions and priorities ... The aim is to achieve a key cultural change: better communication, interaction and mutual understanding, ..." This activity of evaluation in the domain of ITC is designed to be part of the action called "Evaluation of the options for European science and technology policy" proposed in the 4th Framework Programme.

Furthermore, some new types of R&D projects have been launched with very clear-cut industrial and commercial objectives, even if the Community only co-funds the pre-competitive part of the projects: the LCD-TEAM project concerning Liquid Crystal Displays or ASSET concerning the development of a common platform for distributed systems are two examples amongst others. Some other projects are conceived as clusters of projects and market-driven with the involvement of leading-edge users at all stages of the projects. It is, for example, the case of the OMI "Open Microprocessor Systems Initiative" aiming at reducing the European dependancies on non-European sources, or the "High Performance Computing and Networking" aiming at the development of massively parallel computing applications such as simulation, design, management of complex systems (air traffic control, ...). Very often, these projects are regarded as big projects for big companies. In fact, these projects offer a lot of opportunities for SMEs. Finally, accompanying measures are taken to promote "best practices". For example, in the field of software where current practice makes inadequate use of current technologies in particular those developed in the Community Framework Programme, two accompanying measures are being developed: the "European Systems Software Initiative" (ESSI) and the building-up of the "European Software Institute" (ESI) both aiming at improving the quality of software development in Europe, and, as a consequence, strengthening the user companies competitiveness by spreading best practice, improving the quality of the software produced and reducing the cost of development and maintenance. As a general matter, the Director General of DG III now responsible for that part of the Framework programme has asked for the preparation of a document in which measures accompanying the R&D activities would be identified and implemented as action of industrial policy.

WHICH INDUSTRIAL POLICY FOR TELECOMMUNICATIONS IN EUROPE?

There is virtually unanimous agreement in all countries and industries that **information infrastructure** is a key issue for advanced societies and industrialised countries. By infrastructure is meant "hard" infrastructure which is the physical networks of telecommunications but also "soft" infrastructure which includes telecommunications services and all telematic applications.

In the US, information infrastructure under the label "information highways" plays a central role in the new Clinton-Gore technology policy.

In Japan, the recent national stimulus package also includes plans to extend fiber networks at a cost of \$400 billion to every Japanese home by the year 2015.

In Europe, the same political willingness is conveyed and forcefully materialised in the Copenhagen European Summit of June 1993. All the more so that a transeuropean network infrastructure is increasingly regarded as supporting and consolidating the completion of the internal market. The full exploitation of the opportunities created by the removal of intra-Community barriers necessitates the building up of genuine European infrastructures and, on top of them, the provision of advanced transeuropean telecommunication services.

The Community Telecommunications Policy started, in 1984, with the harmonisation of services and terminals equipment and Community cohesion as main objectives. Then after the publication in 1987 of the Green Book on Telecommunications market, the adaptation of the regulatory framework for equipment and services became the main thrust of this policy. This policy has now to take more and more into account its results and its contribution on three issues: (i) the development of transeuropean network infrastructures, (ii) the emergence of transeuropean telecommunications operators and service providers and (iii) the strengthening of the European telecommunications equipment industry. The better functioning of the European telecommunications market remains necessary but, from my point of view, will not be sufficient anymore.

This enlargement of the objectives for the Community telecommunications policy calls for the coherent and coordinated implementation of different policy instruments: the regulatory policy for the liberalisation and the harmonisation, but also the internal market policy for the transeuropean networks, the RDT policy for the technological know-how and the pre-standardisation, the trade policy for equal conditions of access to market and the industrial policy for the coordination and for the positive adjustment and the competitive strengthening of the telecommunications operators and manufacturers.

The Council on Telecommunications of 10 May 1993 adopted the Communication of the Commission on the European telecommunications equipment industry [3] and its recommendations and proposals. This has to be regarded as a step to better take into account some industrial dimension within the usual telecommunications policy. This Communication draws an overall framework and identifies necessary actions of industrial policy. This orientation is a necessity ; action needs indeed to be taken in order to remedy structural problems, insufficiencies in certain leading segments of the market and to address potential threats resulting from imperfect conditions of competition in the world. In substance, four main domains of actions are identified as priority.

First, establishing a genuine internal market. It calls for levelling the playing field for all economic operators in the Community by liberalisation and harmonisation including standardisation. The current Community programme of regulation fits this first priority. This programme is a concrete example of compatibility (non-contradiction) between the competition and industrial policies.

The Commission has carried out an overall assessment of the situation in the telecommunications services sector and considered whether the maintenance of exclusive or special rights for basic voice telephony services and infrastructures was still justified (The "Review"). A broad consultation of the main players in the telecommunications sector has taken place and resulted in clear-cut conclusions. Despite meaningful progress achieved by the policy implemented by the Community, some obstacles to the

telecommunications development subsist: anomalies in the level and structure of tariffs, insufficient supply of advanced transeuropean telecommunications services. On the basis of four optional solutions proposed by the Commission to alleviate these remaining obstacles, a general consensus took shape. Greater liberalisation would lead to substantial growth in the telecommunications sector and full liberalisation of public voice telephony would be both necessary and inevitable.

The Council of telecommunications of 16th June 1993 decided that 1998 would be the deadline for the Member States for liberalisation of voice telephony except for 4 countries (Greece, Ireland, Portugal and Spain - in 2003). This full liberalisation should be respectful of both the regional development and the concept of universal service. As far as infrastructure liberalisation is concerned, further debate and more in-depth analysis appeared to be necessary. Consequently, the Commission proposed to write down a "Green Paper" on infrastructure by 1995 which will be submitted to extensive consultations. The question of alternative infrastructure (closed user groups) is presently considered for possible earlier liberalisation.

The general orientation towards further liberalisation of telecommunications services is obvious. However, numerous questions remain: what are the consequences for the financial stability of the sector, telecommunications operators, service providers and telecommunications equipment manufacturers? How can the development of transeuropean advanced telecommunications services networks be guaranteed? How can the burden of universal services be shared amongst existing players and newcomers? Do we need telecommunications operators with a European stature for basic services and if yes, how can their emergence be stimulated? All these questions would have to be sorted out.

Concerning the development of **transeuropean services networks**, the Commission identified three types of networks it regards as priority: the data communications networks between administrations, the ISDN and the High Speed Networking.

Actions by the Community aim in particular at promoting the interconnection and interoperability of national networks as well as access to such networks. The methodology to be followed is mainly based on the definition of guidelines.

These guidelines consist in a development framework for close coordination between all the parties involved and provide them with the objective, the priorities and their calendar, the broad lines of action and the projects of common interest [5]. The means will be feasibility studies, loan guarantees and interest rebates as advocated in the Treaty on European Union.

Secondly, **supporting research and technological development (RTD)**. The Fourth RTD Framework Programme under preparation will focus on the generic technologies essential to the fundamentally pan-European information infrastructure. It will consist of RTD support to the building blocks for the complex integrated systems: for example, development and upgrading of transeuropean telematics applications for health care, transport, flexible and distance education and training, language and information engineering, high performance computing and networking, integrated personal systems, multimedia systems, integration in manufacturing, mobile communications, intelligence in networks and service engineering.

Thirdly, **developing the terminal equipment market**, a sector where European industry shows a real weakness. The Council has mandated the Commission to organise, in compliance with Community competition rules, a series of concertations with the objective to support industrial efforts to emerge as competitive players in the new market segments.

Fourthly, **improving the conditions of competition in the world market**. The global nature of the telecommunications business requires particular attention to the external aspects of the sector. The actions require in order to level the playing field worldwide for the telecommunications industry come mainly from two Community instruments: commercial policy and competition policy. They will be supported by the "Centralised Point of Information" which the Commission has recently established with a view to monitoring marketing, market access and competitive practices throughout the

world. The Community will continue to raise issues of market access and fair competition in multilateral fora, such as the GATT and OECD, but bilateral negotiations could also prove to be necessary.

Conclusion

The Community industrial policy is at the dawn of a new phase. Its method is clearly defined. Its implementation will mainly be based on the coordination of existing policy instruments. Its specificity is not its instrument but its overall and encompassing approach. Its legal basis will be provided by the Treaty on European Union.

Some examples on the way the new Community industrial policy can positively influence the other Community policies have been given. Due to its very definition and the instruments available at the Community level, the Community industrial policy will have to mainly focus on structural or medium-term issues, and make sure that the Member States industrial policies are consistent with the Community interest and respectful of the Treaty.

The implementation of an effective industrial policy approach will be above all a question of commitment, both politically and by those public and private authorities affected. An approach based on free trade, fair competition and mutual advantage is the only way to stimulate industrial development both at home and in the global market place, and to avoid counter-productive trade disputes. In this respect, an equilibrated agreement with our trading partners is an indispensable prerequisite for an effective industrial policy, and in turn for an improvement in the industrial competitiveness of all our industries.

- [1] Communication from the Commission "Industrial policy in an open and competitive environment: guidelines for a Community approach" (COM(90)556 final, 16.11.90)
- [2] Communication from the Commission "The European electronics and information technology industry: state of play, issues at stake and proposals for action" (SEC(91)565 final, 3.4.91).
Council Resolution of 18.11.91 concerning the electronics, information and communication technologies.
- [3] Communication from the Commission "The European telecommunications equipment industry: the state of play, issues at stake and proposals for action" (SEC(92)1049 final, 15.7.92).-
- [4] "Competition and Industrial Policies: is there a contradiction?" - ADAPES Colloquium, Paris, 28 April 1993, by Peter Holmes, Sussex European Institute, University of Sussex, Brighton.
- [5] Communication from the Commission to the European Parliament and the Council on Transeuropean data communications networks between administrations and Proposal for a Council Decision on a series of guidelines (COM(93)69 final, 12.3.93).

THE INTERNAL MARKET FOR ELECTRICITY & GAS

By MADRON SELIGMAN M.E.P.

The most controversial Community Energy policy, which is dominating energy debates in Parliament at the moment, concerns the Liberalisation of the Internal market in Gas and Electricity. The two Commissioners, Sir Leon Brittan, Commissioner for Competition, and Antonio Cardozo, Commissioner for Energy - together launched the project to establish free and competitive markets in Gas and Electricity (COM(91)0548).

The first steps have already been taken with the directives on Price Transparency and Open Transit across Community territory. Under Price Transparency, industrial customers now have access to data on charges made by gas and electricity utilities to all types of customers throughout the Community. This helps them to negotiate better contracts with their suppliers.

The Transit directive helps trade in gas and electricity between Member States, even if they are separated by a third member state, which has to be crossed.

However, there are still many obstacles to Free Trade in Gas and Electricity:

1. In most member states new entrants to the gas and electricity markets are obstructed.
2. There is virtually no gas to gas competition.
3. There are few gas importers and markets have shared between them by a series of long term contracts containing onerous take or pay clauses.
4. Gas prices are often fixed on the price of oil, regardless of cost.
5. In the electricity sector, there is little choice of supplier except in the U.K., where larger industries can often choose.
6. There is inadequate standardisation of electricity production and consumption equipment.
7. Too many electricity and gas undertakings are vertically integrated from production through transmission to distribution, concealing the true costs of each stage.

- (e) Strict technical conditions for connecting up electricity generators and gas storage facilities to the networks will be essential.
The small consumer will not benefit directly from Liberalisation, but his distributor will be able to negotiate with different producers through T.P.A. and pass on the benefit to the small consumer.
- (f) In order to prevent cross-subsidies between separate divisions of large vertically organised suppliers, a process of "unbundling" is specified.
Production, transmission and distribution divisions should produce separate accounts.
- (g) Take or Pay (T.O.P.) obligations will have to be re-considered in a more liberal gas market. Existing T.O.P. arrangements have acted as a Risk sharing mechanism between producers and gas companies, whereby gas companies guarantee to pay for a pre-fixed annual volume of gas at the contract price, regardless of whether they use it all. The price is normally linked to the oil price. Producers claim that T.O.P. is necessary to justify investing in the development of high cost gas fields.
- (h) Under a more liberalised internal gas market, with multiple users of gas, a new system of Risk sharing may have to be evolved.

So those were the main lines proposed by Brittan and Cardoso. They must now be taken up by Van Miert (for Competition) and Matutes (for Energy). They are now being debated in the European Parliament's Committee for Energy, Research and Technology, where the Chairman, Claude Desama, a Belgian professor, has been chosen as rapporteur - a key position in the whole matter. He realises that this proposal has started a major controversy in the Gas and Electricity Industries.

A powerful lobby campaign has been launched against Third Party Access (T.P.A.) mainly by the Gas Industry, with Ruhr Gas and Gasunie of Holland providing the lead. They point to the problems with Privatisation and Common Carrier in the United Kingdom, where energy prices have risen substantially. They make no allowances for the fact that the U.K. is suffering from teething troubles, before genuine competition between the generating companies can be established and that the nuclear subsidy (Non fossil fuel obligation) will be abolished in 1993.

8. Consequently, gas and electricity suppliers can cross-subsidise between these stages and distort the energy market.
9. Gas and electricity utilities are acting as monopolies.

So Brittan and Cardozo got Commission approval for their proposals in January 1992 and these were passed to the Council of Ministers and Parliament.

There are three stages in the Commission's proposal. Stage 1 is already agreed (price transparency and transit). Stage 2 is now proposed and Stage 3 will be proposed in 1995 or 1996 in the light of experience in Stages 1 and 2.

Stage 2 is based on the following elements:

1. Opening Electricity Generation to Competition.
2. Liberalising construction of electricity transmission and gas pipelines.
3. Third Party Access (T.P.A.) to electricity and gas networks.

Under the Stage 2 proposals:

- (a) Public and private operators should have the right to build lines for electricity or gas to provide supplies to their customers.
- (b) They should be able to hook up their own lines to the interconnected systems.
- (c) To ensure free competition, existing Transmission and Distribution companies should offer access to their network at reasonable charges, within the limits of their available capacity.
- (d) This process should start slowly, with large consumers and producers to start with. That is, sites with an annual consumption of over 100 Gigawatts of electricity or 25 million M3 of gas a year. About 500 industrial consumers would be concerned - mainly aluminium, cement, steel and chemical factories.

Desama has issued a Preliminary Report, where he stresses Harmonisation rather than Liberalisation. He is un-enthusiastic about Competition. He doesn't think that competition leads to efficiency!. He prefers a Regulatory Body to replace Third Party Access in each country. This body would establish conditions of access to the network for independent producers and for companies outside national markets.

The new directive must prevent abuse of dominant positions. It must ensure the application of the directives on Transit and Cost Transparency.

The Regulatory Body would be made up of producers or importers, transmission and distribution companies and final consumers. Exclusive rights to generate electricity would be abolished in respect of new generating capacity.

Transmission of electricity and the construction of power lines to transfer electricity between member states would come under a System Operator appointed for 15 years. Desama prefers the concept of Cost Transparency to the one of unbundling.

A fallacy in Desama's proposal concerns gas imports. He says that members may grant the Right to Import to one (or more) operators. Since most gas is imported (from Russia, Algeria, Norway or the Middle east), this could lead to exclusive import rights for some distributors over most of the gas used in the Community.

So far only three member states have responded formally to the D-G IV Liberalisation proposal.

The next step may be for the Commission to take the matter to the European Court of Justice. This would take at least two years! I think the T.P.A. argument could last many years before it is settled.

Christian Rousing M.E.P. is a Danish Conservative on the Committee for Energy, Research and Technology. He has just submitted a statement on behalf of the Danish Gas companies, concerning the proposed rules for the new Internal Market for natural gas. He sums up the whole T.P.A. situation as follows:

1. The distribution companies are positive to the main principles of an internal energy market, as laid down in the proposed directive.
2. Due to the financial situation of the companies, an interim arrangement to the effect that the current system can be retained until 2002-3, is of significant importance.
3. The principle of subsidiarity should be stressed, but a minimum of common rules and regulations will be necessary for the well-functioning of an internal energy market.
4. Environmental standards should be seen as an important element of an internal energy market - especially in the electricity production sector.

I think that is about right for the time being!

MADRON SELIGMAN

May 1993

EPI

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Appendix VI

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TECHNOLOGY POLICY

and

EC COMPETITIVENESS

by Diana Rowen

European Policy Forum
for British and European Market Studies

April 1993

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INTRODUCTION

A strong technological base is an important ingredient of competitiveness. Yet the European Community's technology policy has more handicapped, than helped Europe in the race towards new innovations. Without a strong scientific and technological base, Europe will be at a competitive disadvantage vis a vis Japan and the U.S. in the development of advanced products and manufacturing methods.

The EC affects the level of industrial investment in innovation by giving money directly to private industry and by setting standards that influence how industry chooses to invest its own money. The two major components of the EC's technology strategy are thus its research and development (R&D) funding policy and its approach to setting standards for new technologies. Both of these aspects are ripe for reassessment this year. Unfortunately, the EC has confused technology policy with industrial policy, and in doing so, has tried to use it as a panacea to Europe's various industrial woes. Technological progress is only one factor of many, such as efficient manufacturing, and marketing expertise, that make for competitiveness. Only when the limitations of technology policy are fully appreciated will the EC be able to use it to improve the pace of technology in Europe -- and by extension European competitiveness.

The EC's R&D policy is embodied in the Framework Programme which divides up billions of ecus among high-tech projects. Now approaching its fourth iteration, the Programme is at a critical stage. Many of the key decisions about its future will be made by the time the Research Council meets in June, with final approval expected by the end of the Belgian Presidency. The Commission has raised the stakes for the Fourth Framework Programme by proposing almost to double its funding.

FRAMEWORK PROGRAMMES¹

	<u>I</u>	<u>II</u>	<u>III</u>	<u>IV</u>
Duration	1984-87	1987-91	1990-94	1994-98
Funding (billion ecus)	3.6	5.4	5.7	8-11 (proposed)

The debate has grown beyond one of funding levels to consider the efficacy of the funding policy as a whole. Many contend that the results of the first three Programmes should by now be apparent. Indeed, in a few specific areas, such as information technology, there have been some notable successes. But more

¹ Also see annex 1.

general reviews, such as an official evaluation published by the Commission last year, are surprisingly vague and/or stinting in their support. Critics have identified some basic conflicts inherent in the Framework Programme's goals and design:

- ▶ requirements to increase the dissemination of R&D results discourage leading-edge firms from participation;
- ▶ a slow and politicised approval process seems geared to anything but selecting projects with a high degree of innovation and scientific merit.

The implication here is not that the EC should cease funding R&D projects, but rather that it take a cold and calculating look at its current approach so as to ensure the Programme's compatibility with market forces.

Focusing solely on the EC's role as an R&D financier, however, would be to miss its more important role as a standards setter. Technology standards set by the Commission can have an enormous influence over private sector R&D investment, which amounted to about 150 billion ecus during the 3rd Framework Programme alone.

Stung by the failure of its 625 million ecu effort to set workable standard for high definition television (HDTV), the EC should now be awake to the need for a fundamental approach to standard setting. In February of this year, the Commission abandoned plans to create a uniquely European HDTV standard. The move has highlighted not only the wasted public funds, but the many millions more ecus of mis-directed private industry investment. This debacle has had the opportune effect of making the Brussels bureaucracy more aware of the hazards of poorly or prematurely formulated technology standards.

Ideally, technology standards increase market efficiency by allowing different companies to develop compatible products. Further, early standardisation of products can encourage innovation in complementary technologies. As such, standard-setting can be a means of improving European competitiveness. Yet, the costs of locking in a standard that appears later to have been wrong are great. While the markets determine most standards, governments set those standards that affect national or international goals. Because government standards are more rigid, the cost of a poor standard is higher. Such standards can misdirect or stymie private R&D investment, thereby putting an industry at a disadvantage vis a vis its competitors. As the EC has found, there is a fine line between setting a standard early enough to give the European markets an edge over foreign competitors and being so early that superior foreign products can later overwhelm the market.

Thus, in the area of R&D, the EC has created a overly complex funding programme. While in the area of technology standards, the EC lacks a basic strategy. This paper will examine how the various programme requirements and policies can be disentangled, and rewoven to create a simpler, more effective technology policy.

THE FRAMEWORK PROGRAMME: SUBSIDIES WITH STRINGS

In 1987 the Single European Act gave the EC responsibility for a European-wide R&D policy and laid out the following general objectives for the Framework Programme:

- ▶ To reinforce the scientific and technological base of European industry, especially in the strategic areas of high technology.
- ▶ To promote this base by allowing industry to acquire critical mass through networks set up among firms, research centres and universities.
- ▶ To reinforce the social and economic cohesion in the Community.

The Framework Programme uses public funds to subsidise specific R&D projects primarily by private firms. The Third Framework Programme will have doled out more than 5.7 billion ecus (6.6 becu including the recent allocation) between 1990 and 1994. The Fourth Framework Programme hopes almost to double the funding.

Despite its title, the "Framework Programme" is really a series of discrete programmes in different technology areas.² Currently, there are over 15 programme areas, including:³

ESPRIT	--	funds microelectronic and software R&D. [ESPRIT = European specific R&D programme in the field of information technology.]
IBC/RACE	--	funds R&D in communication technologies. [IBC = Integrated broadband communications] [RACE = R&D in advanced communications technology for Europe].
BRITE/EURAM	--	funds R&D for manufacturing processes. [BRITE = Basic research in industrial technologies for Europe]. [EURAM = European research on advanced materials].

Each programme funds a group of R&D projects which are, in turn, managed primarily by private research and industrial firms. The EC generally supports these projects on a shared-cost basis.

² The Framework Programme also supports the Joint Research Centre (JRC) which is the Commission's in-house research facility. The JRC currently employs about 2,000 people of which 1,600 work at the Ispra facility in Italy. The JRC has suffered from managerial and personnel problems, but because a panel of independent experts has recently completed an evaluation of these problems, this paper will not address the JRC.

³ See Annex 2 for complete list.

The Case for Subsidy

Economic theory supports governments' intervention in the market to stimulate and subsidise investment in R&D where there is an identifiable market failure. Most innovations have positive externalities. The classic example is the transistor which was developed in 1940s in response to the needs of the US defence programme, but has since revolutionised electronics worldwide. Because it is impossible for a single firm to capture the full benefits (in market terms) of innovations, firms tend to under-invest, from society's perspective, in R&D. Thus, with an eye to increasing technological spillovers, the EC subsidises private R&D projects up to a level of 50 percent across the Community.

But the term "R&D" covers a wide range of activities not all of which are equally deserving of public subsidy. For instance, R&D at the Ford Motor Company can include a project designing next year's sports car, while R&D at Glaxo Pharmaceuticals can include a research project into the genetic roots of disease. The distinction here is not that one R&D project is better than the other, but that the results of one R&D project are easier to appropriate than the other -- from the market perspective of a private firm. Ford, for example, can generally quantify in market terms just how the company will benefit from each additional ecu spent on car design. Glaxo, on the other hand, cannot know whether any specific genetic research project will lead to a marketable product.

Because it is more difficult to appropriate the results of basic R&D projects, governments need to step in and make basic R&D investment more attractive to private firms. The case for government subsidy weakens as it travels a spectrum from 'basic' to 'exploratory' to 'application' and finally to the dubious 'near-market' research.⁴ Thus, government monies are best given to basic and exploratory R&D projects with the potential for the greatest number of spillovers and to R&D projects in fields with applications in numerous industries.

Unfortunately, governments are not always so discriminating in their R&D policies. For instance, Eureka, a large European, but non-EC, funding programme, has chosen to focus primarily on near-market R&D projects. Such investment, on a shared-cost basis, is done in the belief that companies need help turning innovations into marketable products. The UK, in recognition that it is easier for firms to appropriate the results of near-market R&D, will usually fund Eureka projects up to only 25 percent of R&D costs. Other countries, such as France and Italy, who favour a more interventionist approach, often fund Eureka projects up to 50 percent of R&D costs.

Even the EC, in its eagerness to develop commercial products, has neglected basic and exploratory research. A recent survey of the Framework Programme's impact

⁴ While these terms are commonly used, it is not always easy in practice to classify any given project. Also the distance between basic and near-market research varies from field to field.

EUREKA

Eureka was established in 1985 to foster technical cooperation among 18 European countries. The typical size of an Eureka project ranges from 2 to 50 million ecu with half the projects being smaller than 10 million ecu. To qualify, firms from at least two countries must submit a detailed business plan to their national representatives. After receiving national approval, the project goes before the plenary meeting of ministers for all the participating countries who in turn give final approval. There is no such thing as a central Eureka funding authority. When a project is designated as a Eureka project, firms find that they can obtain financial assistance more easily from governments (via grants), bankers (via government-backed loans), and venture capitalists.

Note that about half of the Eureka projects have links with Community programmes. They can cover a latter stage of the R&D on the same technology or be a duplication of effort as in the case of HDTV.

in the UK found that Framework projects fell into the following categories:

Basic	28 %
Exploratory (Strategic)	14 %
Application	43 %
Near-market (Development)	10 %
Other	5 %

Because firms are able to capture most of the benefits of applied and near-market R&D, the case for public subsidy is weak for more than 50 percent of Framework projects in the UK. Not surprisingly, universities in the UK conduct more basic and exploratory research (60%) than does industry (11%). As a general rule, investment in universities and research laboratories is often a good use of government funds. In the US, for instance, many important inventions over the last fifty years are the direct result of the research grants given to such famous research universities as the Massachusetts Institute of Technology (MIT). Investment in university R&D has the added advantage of training a new generation of scientists and technicians as well as providing a relatively open environment for the exchange of ideas.

As EC projects move to the near-market end of the research spectrum, it becomes more and more likely that government funding will substitute rather than supplement private funding. For example, only 44 percent of the Framework's industry projects in the UK would not have been undertaken without supplement funds. Yet among the university projects where a much larger percentage are basic, 65 percent would not have been undertaken without supplement funds. Unfortunately, some in Brussels want to move even further towards near-market

research by blurring the line between the Framework Programme and Eureka. Some even want the EC to support Eureka projects using Framework funds. Clearly all such moves to fund more near-market R&D should be opposed, while the current practice of funding applied research should be curtailed.

In summary, if the EC could limit itself to a simple policy of sharing the cost of basic and exploratory research, it could be confident that the Framework Programme was on the right track. But as the next section shows, the EC's R&D policy has become quite complex.

Cooperative Ventures

The EC's R&D policy puts a twist on the economic principle discussed above by structuring the Framework Programme so that most projects are collaborative efforts. By requiring projects to be cooperative ventures, the EC hopes to reinforce European cohesion.

Between 1987-91, the average number of participants in any given project was 3.7 with the following distribution:⁵

<u>Number of Participants</u>	<u>Number of Projects</u>	<u>Percent of Total</u>
1	613	19
2	392	12
3	448	14
4	395	14
5+	1249	40
Total:	3157	99

In general, Framework programme managers give preference to project proposals that include the participation of firms from at least four countries. About 40 percent of these cooperative ventures are made up of firms who are either direct or indirect competitors, ie horizontal ventures. About 50 percent of the ventures are partnerships of a vertical nature, including customers or suppliers. Unfortunately, the economic case for government support of horizontal cooperative ventures is shaky at best.

The two arguments commonly used in favour of cooperative ventures are that independent research by multiple firms is duplicative, and that there are economies of scale in R&D just as there are in manufacturing. The concept behind cooperative research is that, through sharing, better ideas may be generated, and more efficient use of facilities and equipment may be made. The premise here is that modern-day R&D requires resources beyond the purses of small firms and

⁵ See Annex 3 for more detail.

HIGH DEFINITION TELEVISION

HDTV is the latest in a long line of technologies which the EC believes could give a boost to European competitiveness. The development of a European HDTV standard cost the EC taxpayer more than 625 million ecu, before the Commission finally admitted defeat in February of this year.

The Technology

The HDTV technology has aroused so much excitement because the technology will bring cinema quality pictures into the home. Ultimately, entertainment would be seen on much higher quality, wider⁹ television screens -- possibly on very thin television sets. But such a higher quality picture requires much more information to be sent over the air waves or through a cable. Since there is a limited amount of space available on the bandwidth for any given signal, much of the HDTV's technology is centred around developing compression techniques so that the signal does not use so much space on the bandwidth that interference among signals becomes a problem. As a result entirely new equipment for both sending and receiving HDTV transmissions is needed. Thus, moving towards HDTV means not only that new television sets must be developed, but that entertainment must be recorded in a new format and transmitted to new satellites via new dishes and new tuners. Because an HDTV system will require the coordination of many different industries, the governments have been drawn into the game. Further, each government, in Japan, the US and the EC, hope, by being the first to establish a workable standard, to capture the international market.

Government Involvement

Governments in Japan, Europe, and the US are participating in the development of HDTV in two ways:

- ▶ Subsidizing the research and development of HDTV;
- ▶ Setting standards of transmission -- ie., a common format so that equipment designed by one company is compatible with that of another company.

The subsidizing of HDTV R&D is as worthy a use of government funds as any of the other Framework Programme projects, albeit with the caveats discussed earlier. However, governments', and especially the EC's, involvement in setting an HDTV standard has been problematic.

⁹ Conventional television is shown on a 4x3 picture rather than on the 16x9 picture used in cinemas. A 16x9 aspect ratio has been agreed on by a UN-affiliated commission on international broadcasters.

2. Government should not mandate standards if these are likely soon to require revision -- as is the case where technologies are changing rapidly and engineering consensus evidently is difficult to establish.
3. Performance-oriented specifications are preferable to design specifications (for example, specify strength needs rather than material content for a product).
4. Symptoms of ineffective or premature actions should not be ignored - including negative industry reaction or continuing attempts to break from mandated standards.
5. Sparse response to a proposal may indicate premature action.

Further, government should consider whether in setting standards they are creating trade barriers that may prove costly to consumers in the long run.

As the next chapter will illustrate, the Commission ignored guidelines two and four in its attempt to set a standard for HDTV. The EC should develop a strategy towards standard-setting which incorporates these guidelines, so that it never again handicaps an industry the way it handicapped the HDTV investors.

Research Centre although standard setting is a small but integral part of many other Framework programmes. The Community Bureau of Reference, with a budget of 60 million ecu (1988-1992), focuses on the harmonising of national standards. Unfortunately the EC has found, as have other governments, that it is a long and difficult process to change standards once they have been accepted by the market. Britain is still implementing a standard-size for its electrical plug system. Just imagine the uproar if it now tried to change from the 3-prong plug system to the smaller continental 2-prong system!

Because old technologies tend to be 'locked in', governments often find it easier to set standards for technologies still in their infancy. As a result, standard setting becomes one of the tools of competition policy. If a government can set a standard that allows its domestic industry to reap the enormous efficiency gains described above, then its industry will surge past all foreign competitors to dominate the market. The EC tried to give Europe just such a competitive edge when it supported a European standard for the emerging HDTV technology. As the next chapter illustrates, the EC has, however, failed in this attempt while the US appears to be succeeding.

The Challenge

In practice, government policy makers generally lack the expertise to set ideal standards at just the right moment. As a result, government policy in standard setting can be more anti-competitive than pro-competitive:

- ▶ Government standard-setting processes are vulnerable to capture by large, domestic producers because they can provide the necessary technical expertise.
- ▶ If standards are too detailed, defining product structure rather than product performance, innovation in that technical field will be stifled. (For example, consider train technology. While governments should define the width of rails so that trains can cross borders, they should not define how train engines should be built.)

The implications of these concerns is not that government should never set standards, but that it should take into account certain policy dilemmas. First, there may only be narrow windows of time in which policy intervention can effectively influence the process, before the market "locks in" a standard. Second, the time at which government standard setters can have the most influence, is also the time at which they have the least information.

As a Rand Corporation report shows, governments, should follow five guidelines when setting standards:

1. Government agencies should rely heavily on industry evaluations where they exist, rather than conducting their own technical evaluations.

The above criteria supports the setting of compatibility standards as a general principle. If *optimal* standards could be set in all technical fields, the efficiency gains would in theory be enormous for the whole economy.

Market and Voluntary Standards

However, it would be a mistake to assume that governments set most technology standards. In fact, for most technologies the market converges over time to a common standard. The battle over the videotape recorder (VCR) is a case in point. During the 1970s, there were two types of VCRs, Beta and VHS, each requiring a specific type of tape. As a result, consumers had the problem of finding compatible rental films and rental stores had the expense of maintaining an inventory in both technical formats. During the 1980s, the VHS format came to dominate the market and has since become the standard for all new VCRs. However, it should be noted that the market does not always lock-in on the ideal standard. Historical accident and the problem of providing consumers with good information about complex technologies can often lead to the best marketed or the more obvious, rather than the best technical standard. Beta was known to be a superior technology (better picture quality), but the producers of VHS were better at selling their machines.

Information about new technologies can often be confusing not only for consumers but for industries in related fields, such as vendors. As a result, companies have joined together to set up voluntary standards-setting organizations. These organizations can, for instance, work to ensure that different brands of laser printers can work with a variety of PCs. The number of such voluntary organizations has been growing as firms recognise the efficiency gains to be had from standardization. More than 400 such organizations are estimated to be at work in the U.S., developing and revising standards. The influence of these organizations over the design and the timing of specific standards varies widely. As professors David and Greenstein have noted, it often depends on "(a) the degree to which the technology is already known within the industry, (b) the degree to which investments in particular standards have already occurred, and (c) the degree to which relevant decision makers influence the process, as well as the internal political dynamics of the group."

Government Intervention

Given the volume at which both the market and voluntary organisation set standards, why do governments need to get involved at all? Governments take on the authority for setting standards when they believe the resulting standardization will affect important national or international goals. These goals include the obvious one of increasing economic efficiency, but can also reflect employment and national security considerations.

In the EC, there are two policies driving Commission's standard setters: technical consistency within the Common Market, and international competitiveness. The EC's standards are mainly set by the Bureau of Reference (DG XII) and the Joint

SETTING STANDARDS: TECHNOLOGY POLICY TOO

Glazed eyes and stifled yawns to the contrary, the EC's policy on standard setting is arguably much more important to the industrial future of Europe than the subsidies embodied in the Framework Programme. Every week, numerous new standards are published in the *Official Journal of the European Communities*. These standards range from minimum quality standards for consumer products to compatibility standards for technology. While product standards (including safety standards) do have an effect on the cost structure of an industry, it is compatibility standards that affect the development of a new technology.

Compatibility standards define how two or more pieces of equipment can interface. A well known example is the match between electrical plugs and wall sockets -- a case where a European-wide standard is still lacking. Plugs and sockets are but a simple example of the importance of a compatibility standard. As technological systems, such as telecommunications and computers, have become more and more complex, the need for compatibility standards has escalated. There are a myriad of standards today particularly in the fields of computer software, telephone equipment, and television. But why should the EC, or any government, have a role in setting standards? And what effect does standard setting have on the rate of innovation?

Standards as Public Goods

Governments become involved in setting compatibility standards because they meet many of the traditional economic criteria of a public good, as Paul David of Stanford University has shown:

- ▶ By publishing the standard, all competitors in a field are provided with an equal amount of information, thereby levelling the playing field.
- ▶ Barriers to entry among multi-component goods are reduced because suppliers are able to specialise in reducing costs and/or improving quality.
- ▶ Standardisation, makes product comparison simpler and more meaningful for customers -- pushing the market structure away from that of monopolistic competition and attempts to extract rents by product differentiation.⁸
- ▶ Early standardisation of products may encourage innovation in complementary technologies.

⁸ The introduction of compatibility standards is a prerequisite for the effective deregulation of "natural" or state monopolies where technical compatibility had previously been merely an internal concern for company managers.

in its selection of panel participants. In particular, it could ensure that certain types of experts, such as academics, do not dominate the panel.

- ▶ The Science & Technology Council would publish the expert panel's evaluations (ie the four grades for each project) as well as whether or not the project was selected by the Commission. While any given publication would not necessarily be significant in itself, the statistics that it could generate over time would be very revealing. For instance, it would quickly become clear which programme areas placed the least weight on innovation in their project selection. The Council would also require DGs and Programme Committees to explain major discrepancies between their decisions and the expert panel's evaluations.
- ▶ The Science & Technology Council would have responsibility for evaluating the Framework Programme on an ongoing basis. In this role, it could advise the Research Council on which programme are least successful and could advise a reallocation of funds when next Framework Programme is being devised or, if necessary, mid-way through the life a Framework Programme.

Thus, the Independent Science & Technology Council could improve the objectivity, transparency and accountability of the race for Framework funds by monitoring both starting and finishing line.

Unfortunately, there are several major flaws in this process. Because the expert panel is only made up of 5 to 10 people, those experts who are left off the panel are as often important as those who are on the panel in determining which projects are chosen. The Commission can to some extent shape the project evaluations by selecting a panel of a certain complexion. Further, although the panel's evaluations are not officially published, they can be easily obtained by interested parties outside the process. With the evaluations in hand, these parties can lobby both the DG programme managers and the Programme Committee to weigh certain of the four grades more heavily so that their projects are selected. Finally, although the Programme Committee can question any discrepancies between the expert panel's evaluations and the DG's selection, no such explanation is available to the public.⁷ Transparency and accountability are therefore key problems.

An Independent Science & Technology Council

The realities of Brussels are that who the applicants are often matter more than the quality of their proposals. Not only are representatives from Member States determined to get their share of the R&D funding pie, but the lobbyists from the large European corporations stay in constant contact with the relevant departments within the Commission as well as with their national representatives to ensure their interests are protected. While contact between firms and the Commission is good, smaller firms with worthy projects can find themselves at a disadvantage because they can not afford to maintain lobbyists in Brussels. Such pressure can lead to the 'best' projects not being selected for the Framework Programme -- best, that is in terms of scientific merit and degree of innovation.

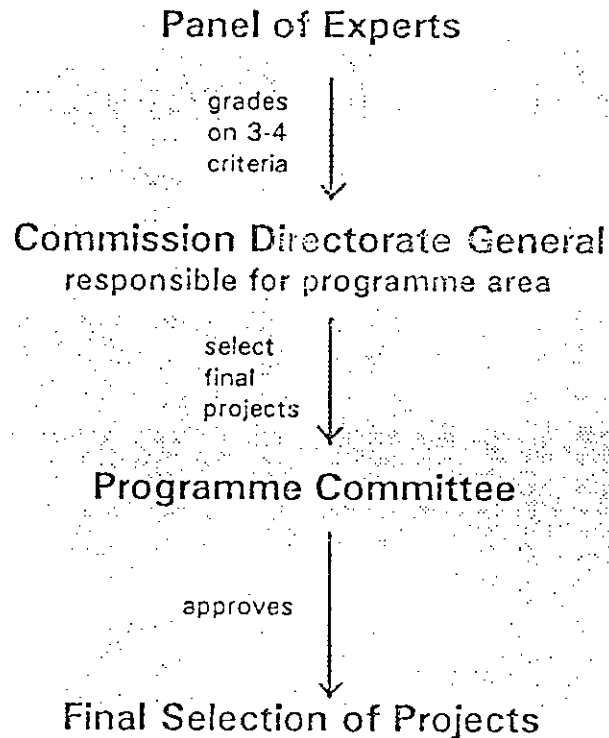
To achieve an R&D policy which truly stimulates innovation, the selection of individual projects should be insulated as much as possible from political pressures. Such an end could well be achieved through an institutional change. Specifically, the Community should set up an *Independent Science & Technology Council* which would be charged with overseeing the project approval process. The flaws in the current process could be largely mitigated by eliminating areas where decision makers have a conflict of interest and by increasing the transparency and accountability of the process. As the CREST report noted, the Research Council needs timely, independent and authoritative assessments of the Framework Programme's performance. Only an institution independent of the Commission would have the objectivity to ensure these ends.

The Independent Science & Technology Council, which would report to the Research Council, would have three main responsibilities:

- ▶ It would choose the expert panel, albeit with suggestions from the Commission, CREST, etc. Because this Council would be less vested in the outcome than DG programme managers, it could be more objective

⁷ In some programme areas, the Commission will eventually notify individual project proposers why their project was rejected, but there is no general justification.

PROJECT APPROVAL PROCESS



Programme Committee is made up of mid-level government representatives of Member States knowledgeable in the programme area.

Expert Panel is made up of 5 to 10 people (usually scientists) chosen by the Commission who are recognised as experts in the technology under consideration.

Thus the evaluation by the expert panel is made up of four grades for each project. Second, the panel sends the evaluation of all projects to the Directorate General (DG) charged with overseeing that programme area. (For example, software project proposals would be reviewed by a panel of software engineers and the evaluations would then be sent to DG XIII which manages the ESPRIT programme.) Using these grades DG programme managers eliminate the less desirable projects until a final group of projects is selected. This final selection is then sent the Programme Committee. The Programme Committee, which is made up of government representatives from the Member States, can question a DG on any discrepancies between its selection and the grading of the expert panel. But in the end, it must usually approve or refuse the DG's selection as a whole.

rather support any firm with a sound proposal for basic or exploratory R&D. However if it must pick and choose, it would do well to base its selection on objective criteria -- similar to those chosen by the Netherlands.

Bureaucracy

The EC's Framework Programme has not been without its claims of success. For example, according to the Commission's evaluation of the Second Framework, 500 of the 650 projects launched by ESPRIT produced tangible results. Yet many of the software manufacturers taking part in ESPRIT complained that the programme was too complex and too fragmented. Specifically, procedures for preparing and announcing projects involve too much time-consuming red tape. Accusations of delay are not limited to ESPRIT and these delays have serious consequences in fast moving technologies. Further, the greater the bureaucratic burden perceived by potential applicants the less likely that the smaller firms will apply. The experience of the United States has been that it is the smaller firms (ie, "start-ups") which are at the forefront of the technological revolution. The EC needs to encourage the participation of such small firms in Europe.

In response, the Commission has begun to try and streamline the process. Filippo Maria Pandolfi, the then Commissioner in charge of technology policy, last year merged several operations of DG XII and DG XIII. Further changes are planned for 1993. If the Maastricht treaty is ratified, all non-Framework programmes (most of these are in the fields of energy and environment as part of entirely separate EC policies) will be brought within the Framework Programme. To the extent such changes reduce duplication of effort within the Commission bureaucracy, participating firms will benefit.

The Project Approval Process

Yet none of these managerial changes will fix the real problem within the application process: the political pressures brought to bear on the Commission and the Programme Committee as they prioritise among projects. The structure of project approval process makes it vulnerable to such pressures.

As the box on the next page shows, all projects in a given programme area must go through three basic steps before they are approved. First, a panel of experts reviews all projects proposals in a given programme area. They then grade the project proposals against four criteria⁶:

1. Degree of innovation (anonymous),
2. Cost effectiveness,
3. Quality of the cooperative venture,
4. Project management structure.

⁶ These criteria vary slightly among programme areas.

each new Framework Programme becomes such a political nightmare. For instance, in a criticism of the BRITE/EURAM programme, a German delegation commented:

"... the scientific merit, the degree of innovation and thereby the contribution of a proposal (project) to the enhancement of competitiveness unfortunately play, from call to call, an ever decreasing role." (CREST report)

In Brussels the process of picking winners is further distorted by national representatives manoeuvring to see that they receive their share of the R&D funding cake. For instance, German representatives in Brussels are well aware that although Germany provides about 25 percent of R&D funding it gets back only 23 percent. In general, the large industrial countries, such as Germany and France, favour the high-tech ESPRIT and IBC/RACE programmes, while the smaller countries support the Agricultural and Human Mobility programmes. Because the smaller countries have fewer leading-edge firms to compete for R&D funds, they often prefer those programmes which focus on individual scientists and regional industries. While such pulling and tugging over the shape of the Framework Programme may result in a nationally balanced funding programme, it has little to do with advancing the technological base of Europe.

A More Objective Approach

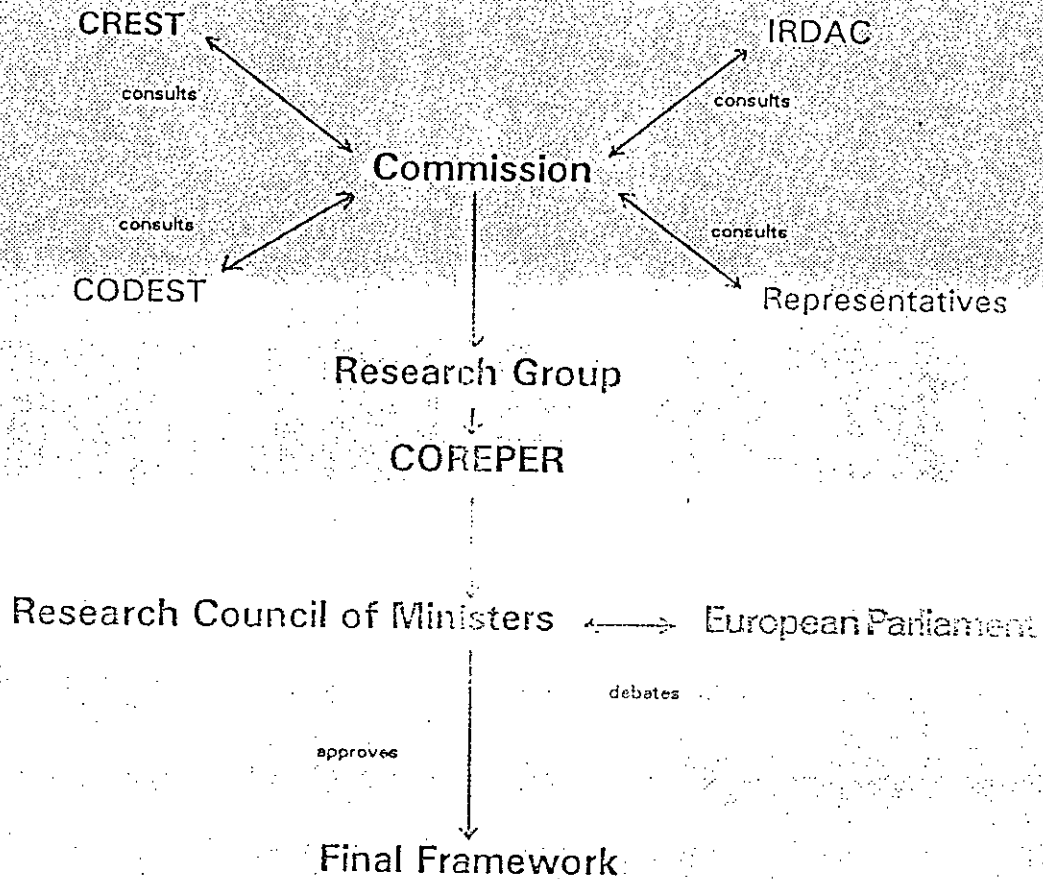
An ideal technology policy is open to innovative ideas from any industry, not just from a few high-profile industries. It sets forth a series of objective criteria by which project proposal can be judge against. The Netherlands has, in fact, gone part way to such a policy. In a report on generic technologies, the UK noted the Netherlands's set of objective criteria:

- ▶ applications potential -- the technology's *breadth* of potential applications in the next five to ten years;
- ▶ relevance for diffusion -- to small and medium sized companies as both producers and user of the technology;
- ▶ critical mass -- of groups knowledgeable in the technology in industry, research and educational infrastructure; i.e., potential for networking;
- ▶ multi-disciplinarity -- of the technology which is thought to generate higher expectations than the technologies in mono-disciplines.

Here the Netherlands has succeeded in developing an R&D policy which looks to its own comparative advantages in technologies and to where investment should have the most widespread effects. These criteria have lead the Netherlands to select the technical fields of mechatronics, adhesives and chipcards, and electronic labelling.

Ideally, the EC should not restrict its support to just the *high* technologies, but

DEVELOPING A FRAMEWORK PROGRAMME



CREST = Science and Technology Research Committee; responsible for coordinating R&D policy between Commission & Member States.

IRDAC = Industrial R&D Advisory Committee

CODEST = Committee for European Development of Science & Technology; responsible for proposing new priority areas.

Representatives include the science & business communities.

Research Group is made up the Science Attachés from Member States.

COREPER = Committee of Permanent Representatives.

By selecting certain technologies and industries to be winners, the EC is also labelling others as losers. It is therefore not surprising that the development of

DECISION MAKING IN BRUSSELS

Background

The first attempts at European collaboration began in the early fifties with the creation of the European Coal and Steel Community and the European Atomic Energy Community (EURATOM). The real impetus for such coalitions emerged in the late seventies when a severe recession in high-tech markets hit Europe. Europe had been content until the early seventies with its technological lead in various major research and product developments. But by the late seventies, it was shocked to find itself steadily losing ground to the America and Japan, especially in the fields of telecommunications, advanced materials, and life-sciences. The early response to this technology gap was to create collaborative programmes such as the European Space Agency.

But it was not until the early eighties that Member States seriously considered whether there would be benefits to having an EC R&D policy in addition to their national R&D policies. In particular, Member States concluded that Europe-wide programmes would more likely lead to European-wide technology standards. By then, it was clear that the hodge podge of incompatible national standards had hurt European competitiveness. Thus, in 1987 when Member States ratified the Single European Act, they formalized and expanded earlier EC R&D programmes in Title V of the act.

The Framework Programme has been designed so that both funding and institutional controls devolve downward: from Brussels, to national governments, and then to individual firms. This top-down system, as opposed to the Eureka programme's bottom-up system, has proven not only bureaucratically slow and vulnerable to political lobbying, but has also opened the Framework Programme up to accusations of trying to pick technological winners.

Picking Winners

As the diagram on the next page shows, the choice of which technologies will receive the EC's blessings lie almost entirely within the hands of Brussels bureaucrats and politicians. Although there are frequent consultations with outside committees, scientists, and businessmen, these policy makers remain poorly equipped to decide which R&D programmes will give Europe a competitive advantage. The selection among technologies might well be improved if *independent* experts and businessmen (ie, those without conflicts of interest) had a larger and more responsible role in the selection process. Historically, because it is difficult to decide which technologies are more likely to have positive externalities, bureaucrats have instinctively favoured the high-tech industries, such as aircraft, pharmaceuticals, and electronics. Yet, as Paul Krugman of MIT points out the claim that social returns to high-tech industries significantly exceed the private returns is at best unsupported by the evidence.

because public funds are used to finance Framework projects, the EC has decided that ownership of the ideas arising out of such projects should lie in the public domain. Current policy requires firms receiving EC R&D funds to grant:

- ▶ non-exclusive licenses to other organizations in the community if these licenses will enable them to conduct their own EC-supported research projects;
- ▶ licenses on favourable conditions for R&D or for commercialization to any legal R&D-based entity in the EC, provided the business interest of the original patent holder are not prejudiced.

While such requirements do achieve the policy goal of increasing the dissemination of information, they can also have the contrary effect of reducing the incentive to participate in the Framework Programme. Because firms recognise in advance that they may have less control of their ideas if they use Framework funds, some are discouraged from participating in the programme. The question is then whether the Framework Programme is left funding mediocre projects. The EC should reexamine its licensing requirements in light of the current market forces in intellectual property rights

Future legislation may also scale back intellectual property rights for privately funded R&D projects. Some in Brussels are recommending that licensing without compensation should become compulsory regardless of funding source. The reasons for this move are not as absurd as they appear at first glance. In recent years, large firms in particular have been protecting their segment of the consumer market by filing thousands of patents with slight variations around a basic idea. Even when the patent (in any of its various forms) is never used, it acts as a blocking mechanism, which can be particularly painful for small firms. While the warehousing of ideas clearly does not benefit consumers, undercutting intellectual property rights also does not benefit society. A more reasonable solution to this dilemma may be to require the compulsory licensing of patents still unused after a few years. By releasing all these warehoused patents, the markets may then be freed to develop new products for consumers. However, even this approach could remove much of the incentive for firms to invest in R&D. In considering this issue, the EC needs to ensure that the immediate benefit to consumers of such a policy does not blind them to the long term implications for the pace of innovation in Europe.

report points out:

"... the key factors which might encourage dissemination are those which may discourage firms with leading edge technology from participating in programmes or from undertaking the investment or to exploit fully the results of research carried out under the auspices of the Community."

If the Framework Programme is to succeed in its principal goal of increasing investment in R&D, the dissemination and cohesion policies should be disentangled from the funding policies. Such a move would then allow decisions about the relative merits of various R&D projects proposal to be made on a more objective basis.

To disentangle these policies, the EC should reduce the emphasis on large cooperative ventures as discussed above. Rather, the EC should boost those programmes which encourage dissemination and cohesion without creating perverse incentives for private firms.

A key programme here is the Human Capital and Mobility Programme. This programme subsidizes the exchange of researchers across national boundaries as well as supports the creation of professional networks. In the Third Framework, this programme is spending 490 million ecu to share researchers across Europe.

If dissemination of information is truly a goal of the EC's R&D policy then this programme arguably deserves greater financial support and expansion. The EC should ensure that engineers and scientists in all fields are included. Further the policy should support temporary assignments from private firms to universities as well as the reverse (ie the programme should not just focus on scientists completing their post-doctoral training). Because this programme satisfies the Single Act's objective for dissemination and cohesion, the EC should increase its funding. Specifically, the EC should raise the Mobility Programme's funding from its current level of about 10 percent of the Framework budget to 20 percent of the budget.

There is, however, one caveat to the expansion of this programme. There is a growing concern that the programme is becoming bureaucratic and unwieldy. Firms are becoming discouraged over how long it takes to engage a researcher through the EC process. The EC needs to ensure that the programme requirements remain as flexible and uncomplicated as possible so that the transfer of a researcher take no longer than a couple of months.

Intellectual Property Rights

Another important problem confronting Brussels is the ownership of the ideas arising from EC-funded R&D projects. Intellectual property rights (ie, patents) exist to give firms the incentive to invest in R&D and commercialise ideas by giving them the sole right to use a product idea for a limited number of years. However,

SEMATECH

The US's experience with the cooperative microelectronic venture, Sematech, is often pointed to by European policy makers. Yet it is too early to say whether Sematech has been a good public investment. The US government has funded half of Sematech's \$200 million annual budget for the last five years in the hope of halting the Japanese erosion of the US semiconductor market. The initial goal of the joint venture of fourteen US firms was to advance DRAM technology which were seen as the "technology drivers" of all semiconductors. However Sematech ended up using the money to subsidise semi-conductor machinery firms. So a venture that started as a horizontal cooperative venture became a vertical venture. This approach now appears to have helped advance the machine technology, but it is unclear whether there have been corresponding advances in DRAM technology (ie, the benefits have been more upstream than expected). Critics claim that Sematech is taking credit for gains that would have been made anyway, as market pressures forced machinery firms to improve quality and efficiency. They also complained that the venture has discriminated against small firms. Its membership policy requires minimum dues of \$1 million -- too much for many smaller, and often more innovative, firms. Other critics point out that it was the relaxation of the antitrust regulations to allow Sematech members to collaborate on pre-competitive research that was the basis for change. In fact, some suggest that "Sematech budget ... went to pay for some expensive, if important, meetings." (FT, Feb 9, 1993) The question here is not whether firms can produce results by cooperating, but whether government support is justified. If the critics are right, then antitrust policy has proven more important to Sematech than the public funding.

Therefore governments should be wary of supporting large cooperative R&D ventures -- especially those among competitors. The EC needs to ensure that the potential benefits outweigh the potential costs before funding such projects. Because 'bigger is better' thinking does not apply uniformly to all cooperative ventures, the EC should revise its funding policy. In the case of horizontal ventures, it should reverse the current presumption so that firms must prove that a large cooperative venture will have significant R&D advantages over small or even single-firm venture.

Disentangling Framework Policies

Another motivation behind the requirement for cooperative ventures is the commendable goal of broadening the technical and scientific base throughout the Community. To meet this goal, the Framework Programme requires mandatory licensing of patents as well as sponsors the Joint Research Centre and a personnel sharing programme. While each of these policies can contribute to dissemination

laboratories.

The counter arguments to horizontal cooperative ventures are:

- ▶ **Variable economics of scale.** The "economies of scale" argument does not apply equally to all types of R&D. For instance, high-energy physics using linear accelerators the size of football stadiums is more likely to have significant economies of scale than micro-electronic chip development where much of the research is now done on mid-sized computers.
- ▶ **The lack of competitive incentive.** Cooperation among the leading firms in a technical field can be stultifying rather than stimulating. By allowing firms to get a closer look at their competitor's progress, a marker is set in the developmental path of a technology beyond which firms will not worrying about striving.

Vertical cooperative ventures are generally less susceptible to the above problems. Collaboration between suppliers and customers increases knowledge of each other's technical needs and limitations -- which can in turn improve the quality and efficiency of the future product chain. Nevertheless such vertical ventures are vulnerable to the same managerial pitfalls as horizontal ventures:

- ▶ **Managerial Problems.** Cooperative ventures face three types of managerial problems: 1) participating firms are unlikely to assign the best scientists and engineers to the project; 2) because these ventures involve competitors, participating firms are reluctant about sharing their best ideas or their latest technologies; 3) there is friction associated with getting people to cooperate who come from different institutions, with different work methods, from different cultures, etc.

The recent survey of the Framework Programme's impact in the UK, both industry and academia complained of high administrative overheads and loss of control. More than 50 percent found that collaboration increased project costs, often significantly:

	Decrease or Increase in Project Costs						
	<u>-51% or less</u>	<u>-11% to -50%</u>	<u>0 to -10%</u>	<u>No Effect</u>	<u>0 to 10%</u>	<u>11% to 50%</u>	<u>51% or more</u>
Proportion of projects	6	16	9	16	12	34	6

While some increase in project cost might be reasonable, there must be identifiable benefits to outweigh these added costs. Further, the probability that any given venture will fall victim to these difficulties increases with the number of participants. If large cooperative ventures become a managerial nightmare, they fail not only to advance technology, but also to increase European unity.

The EC originally became involved in standard setting at the request of the consumer electronic companies. In the late 1980's, these companies feared that Japanese HDTVs would shortly drive all conventional TV producers in Europe out of the market: As a result, the EC was asked to set a standard that would not only give the industries a technical format to coalesce behind, but that could also act as a market barrier to foreign imports.

The EC's Fumbled Policy

It seems such a simple task -- the setting of a technology standard. But what the EC regulators failed to appreciate when they undertook the task was how much HDTV was still in its infancy technically.

The EC initially proposed that European HDTV be based on the MAC standard, an *analogue* technology. Unfortunately MAC systems are susceptible to interference and poor picture quality for receivers very far from the transmitting source. But the EC, assuming that the MAC approach was the most viable option, proceeded to finalize its HDTV policy with funding and standard setting programmes. What the EC failed to consider was that R&D programmes in other countries were working on a solution to HDTV's analogue problems. The solution has turned out to be a digitally based system. It now appears that a digital HDTV will not only provide a clearer signal and picture, but will open up a whole hosts of technological frontiers in the areas of computing, information storage, and interactive media. In other words, TV's could be made to operate like computers.

In 1986 the EC laid the ground work by issuing a directive requiring medium and high-powered satellite broadcasters to use the MAC standard. But European broadcasters, primarily SKY TV, managed to avoid the expense of switching from the old PAL standard to the MAC standard by figuring out how to use a low-power signal. In 1991 the EC adopted a further directive which required that after 1996:

- ▶ services be able to broadcast simultaneously (in both conventional and MAC format);
- ▶ satellites be able to transmit both signals;
- ▶ new TV sets be fitted with a MAC decoder (ie, be able to show an HDTV picture.)

Interestingly, during the development of this directive, the European Parliament recommended a amendment that would have left the door open to non-MAC standard -- but it was not accepted by the Commission.

Despite the 1991 directive, EC officials, or at least those outside of DG XIII, were questioning the advisability of a MAC standard by April of 1992. Not only were they concerned about proposals to invest a further 500 to 850 million ecus in a technology that offered few advantages in terms of quality for the viewer, but they were concerned about the progress made in the US with digital HDTV.

In the US where a HDTV standard has yet to be set, American as well as a few interested Japanese and European companies have been competing to develop the most advanced HDTV. As a result most experts are now convinced that digital HDTV is the system of the future. But while the US was moving ahead with HDTV development, the EC became mired in a morass of directives. If this nightmare had managed to isolate itself to Brussels, little damage would have been done to Europe's budding HDTV producers. However, the prospect of an HDTV standard sucked many of the audiovisual producers, such as Philips, Thomson, and Bosch into the process, thereby disrupting their own R&D programmes. Such disruption was quite understandable; companies have little incentive to advance a technology, if government looks likely to set the technology's standard at a more primitive level.

Resistance

Much of the EC policy on HDTV has been driven by France, Germany and the Netherlands, who have benefitted from the funds allocated by the EC for HDTV R&D. By contrast, the UK, although a large TV producer, has long been opposed to this policy, reckoning that it would be better to allow market forces to decide the matter rather than invest millions of ecus into promoting a new TV standard that nobody really wanted. In 1992, Britain went so far as to block a 500 million ecus MAC proposal, offering instead to support a 80 million ecu programme just to keep the HDTV programme alive. Meanwhile, industry became increasingly afraid that the analogue technology would either be surpassed by digital technology or be unpopular with consumers. Companies became so wary that they decided to launch MAC HDTV projects, only if the Community paid for virtually all additional costs generated by the production and dissemination of the new standard.

By late 1992, in an effort to calm industry fears, the Commission first gave up trying to bind firms legally to an HDTV standard by means of a Community-wide agreement. It hoped to continue support for the MAC standard by linking HDTV R&D funds to a commitment to the standard. All these efforts notwithstanding, the Commission finally admitted defeat in February of this year. The Commissioner for Industry, Martin Bangemann, announced that European HDTV would follow the digital standard similar to that being set by the US.

The EC has clearly lost the race to set an HDTV standard that will give it a competitive advantage internationally. However, because so much political capital has already been spent, the EC is still likely to subsidise the development of the digital technology. Yet, as the technology is becoming increasingly better researched and developed, it is becoming an increasing near-market technology. If that is indeed the case, the case for public support is weakening -- the EC might well find its funds better invested in a newer, more basic technology.

CONCLUSION

The EC's technology policy needs a fundamental revision, not just the face-lift envisioned in the Fourth Framework Programme. At the heart of its technology policy problems is the way in which the incentives to invest in R&D that the EC has created with one hand, are eroded by the other hand.

The basic approach of EC technology policy, granting R&D subsidies for increased investment in basic and exploratory research, and setting standards for greater market efficiency, is well justified by economic theory. However, the EC has managed to distort what is otherwise a sound policy. In the Framework Programme, it has attached too many strings to its funding grants. By requiring all projects to be cooperative ventures, it undercuts the competitive incentives of the market. By limiting the intellectual property rights of participants, it discourages firms from joining the Programme. By funding only "strategic" technologies, it focuses industry interest on the high-profile technologies, to the detriment of more worthy, less sexy technologies. By delaying and politicising the project-selection process, it ends up funding mediocre projects. Further, by failing to have a standards-setting strategy, it stifles innovation. Clearly, the EC's aim should be to complement market forces rather than undercut market incentives. In summary, the EC should make the following changes to its technology policy:

The Framework Programme

- ▶ Fund 'basic' and 'exploratory' rather than 'applied' research projects: Because there is less likely to be market failure among 'applied' and 'near-market' research projects, the EC should curtail its funding of these projects. Currently, more than 50 percent of the Framework projects in the UK fall into this category. Instead, the EC should direct these funds to 'basic' and 'exploratory' research projects, even if means more money going to universities rather than to industry.
- ▶ Stop trying to pick technology winners: First and foremost, the EC should not limit its R&D grants to a select group of "strategic" technology areas. Instead, the Commission should develop a set of criteria for judging individual projects, such as the potential for useful spillovers, the relevance for diffusion to small and medium-sized companies, and whether there is a critical mass of people knowledgeable in the technology.
- ▶ Establish an Independent Science & Technology Council: To achieve an R&D policy which truly stimulates innovation, the selection of individual projects needs to be insulated from political pressures. The Community should set up an *Independent Science & Technology Council*, which would oversee the selection of individual projects for each programme area. Specifically, it would administer the expert panels, report their recommendations publicly, and evaluate the results of each programme area. By separating these responsibility from the Commission, the objectivity,

transparency and credibility of the decision-making process would be improved.

- ▶ **Double the share of funding for the Human Capital and Mobility Programme:** This programme should be expanded from 10% to 20% of the Framework budget because it meets the EC's goals of increasing the dissemination of knowledge and improving European cohesion -- without creating perverse incentives for participating firms.
- ▶ **Reverse the burden of proof for horizontal cooperative ventures:** Rather than require firms applying for an R&D grant to have numerous partners, the Framework Programme should require applicants who are competitors to show that a large cooperative venture would be significantly more effective than a small venture. In addition, both horizontal and vertical cooperative ventures should undergo more rigorous scrutiny for likely managerial complications.
- ▶ **Reexamine the mandatory licensing requirement:** This requirement may need to be removed from the Framework Programme because it can deter qualified firms from participating. Mandatory licensing limits the ways in which participating firms can market EC-subsidised innovations. Since strong intellectual property rights are important incentives for private firms to invest in R&D and then to commercialise new ideas, the EC should resist all attempts to further weaken these rights.

Technology Standards

- ▶ **Develop a strategy for EC Standard-Setting:** As the European experience with HDTV has shown, the cost of setting the wrong standard at the wrong time in the life of a new technology is enormous. A basic policy would set out the guidelines which would define not only when a technology standard might benefit the market, but which warning signals indicate that the Commission is setting a premature or overly rigid standard. This strategy should favour:
 - standards when the benefits to consumers of reducing meaningless product differentiations outweigh the costs of implementing a new standard,
 - performance-oriented rather than design-specific standards so that products can continue to improve over time,
 - standards only where technologies are not changing rapidly (this is often signalled by strong industry resistance to a standard), and there is some engineering consensus on the form of the proposed standard,
 - standards that are consistent with the idea of open and competitive markets and that do not act as significant trade barriers.

The implication of these recommendations should not be that EC technology policy be scaled back. Rather it should be honed into a more effective tool. It might be rather unrealistic to expect policy makers in Brussels to make the principal goal of EC technology policy the improvement of Europe's technology base. But if it can focus technology policy on this one objective, rather than on a myriad of industrial policy objectives, the EC will have satisfied one of the key requisites of European competitiveness in the next century.

ANNEX 1

PAST FRAMEWORK PROGRAMME BUDGETS

Percentage of Total Budget

<u>Technology Field</u>	<u>1984-87</u>	<u>1987-91</u>	<u>1990-94</u>
Information and Communications	25	42	39
New Industry and Materials	11	16	16
Energy	50	23	14
Biotechnology	5	9	13
Environment	7	6	9
Human Capital & Mobility	2	4	9
Total	100	100	100
<hr/>			
Total Cost, billion ecus	3.8	5.4	5.7*

Comparable figures for the Fourth Framework Programme are not yet available.

Note, because of the delay in approving the Fourth Framework Programme, the Third was recently allocated an additional 900 million ecu for the last two years -- making the total 6.6 billion ecu.

Sources: Eurostat and *The Economist*

ANNEX 2

FUNDING LEVELS BY PROGRAMME AREA

(million ecus)

<u>Programme Area: Title</u>	<u>Framework II</u>	<u>Framework III</u>
Information Technology: ESPRIT	1,600	1,300
Nuclear Fusion & Safety: JET	740	410
Communications: IBC/RACE	550	480
Industrial: BRITE/EURAM	500	660
Agriculture: ECLAIR/FLAIR/FAR/FOREST	240	330
Human Mobility: SCIENCE/SPES	200	490
Environment: STEP/EPOCH	120	260
Non-Nuclear Energy: JOULE	120	160
Biotechnology: BRIDGE	100	160
Telematics: DRIVE/AIM/DELTA	100	380
Biomedical/Health	80	130
Science for Developing Countries	80	110
Measurements: BCR	60	50
Marine: MAST	50	100
Adjustment*	860	680
TOTAL:	5,400	5,700

Note, because programmes are designed to overlap slightly, the sum of the individual programme budgets does not exactly equal the total budget for each Framework. Also some minor programmes have not been included.

Sources: Eurostat and Catalogue of Research Programmes within the Framework Programme of the European Community, DGXII.

ANNEX 3

TOTAL PROJECTS BY THE NUMBER OF PARTICIPANTS IN EACH PROJECTS IN THE SECOND FRAMEWORK PROGRAMME

Programme Area	<u>Number of Participants</u>							8+ Total
	1	2	3	4	5	6	7	
Quality of Life	23	32	37	42	34	23	7	50248
Communications	8	13	46	89	111	86	88	219660
Mod. of Industry	13	33	77	108	111	65	35	60502
Biological	17	14	35	51	36	38	16	32239
Energy	159	76	76	40	32	20	8	16427
Development	240	41	22	12	5	2	0	0322
Marine	16	45	41	31	17	16	4	7177
Cooperation	137	138	114	82	49	32	11	19582
TOTAL	613	392	448	455	395	282	169	4033157

Note, there were a total of 11,795 participants in 3,157 projects for an average of 3.74 participants per projects. This table reflects only shared-cost-contract projects.

Source: "Evaluation of the Second Framework Programme of RTD: Report from CREST to Council, Brussels, 25 September 1992.

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THE FUTURE OF EC R & D AND INDUSTRIAL POLICYIETT Conference, 6 July 1993CASE STUDY 2 - EXPERIENCE OF PARTICIPATING IN
EC R & D PROGRAMMES

Dr Brian Isherwood, Hirst Research Centre, GEC Marconi Ltd

The purpose of this brief presentation is to provide a first hand and balanced resume of our experience in participating in EC R & D Programmes. Since experience gained can, to a certain extent, be dependent on local issues, it is stressed that this is an HRC, not GEC, perception. In this context it is, therefore, relevant to explain the role of HRC and its relationship to GEC Companies and to non-GEC establishments.

The review commences at the initial Project Definition Phase, for the decision of whether or not to "go collaborative" must stem from a business and technical review of the Project Aims and Objectives. Lack of a clear strategy at this stage increases the risk of embarking on an expensive, frustrating and timewasting activity. Once having resolved to seek a collaborative venture and armed with specific objectives, the necessary steps then to be taken to achieve the project submission within a time-frame are, usually, well defined. The presentation will comment on following this sequence and continue on to the project launch and execution, on the assumption that the submission is successful and the project is awarded. Reference will be made to the cited three Projects (one completed and two still in progress) to illustrate and emphasise specific points. Finally, other potential benefits which are available as a consequence of participating in EC collaborations will be discussed.

- Projects:
- (a) Basic research into fabricating silicon-heat sink assemblies in high-power semiconductor devices. BRITE Project.
 - (b) Development of low melting point aluminium alloy brazes. BRITE-EURAM Project.
 - (c) High temperature superconductors for power cables. BRITE-EURAM Project.

STRUCTURE OF PRESENTATION

- 1 THE HIRST RESEARCH CENTRE, relationship to GEC Companies and non-GEC establishments.
- 2 PROJECT DEFINITION, PREPARATION AND SUBMISSION:
 - (i) Project Definition and specification of Aims and Objectives - intra Company discussion.

- (ii) Whether to "go Collaborative"
- (iii) Identification of potential Partners and forming a Consortium.
Selection and role of the "Lead Company"
- (iv) Writing and submission of proposal.
- (v) EC Judgement

If successful - go to 3

Unsuccessful??

3 **PROJECT LAUNCH AND EXECUTION**

- (i) Writing the Consortium Collaborative Agreement.
- (ii) Undertaking the Project
 - Administration
 - Technical Infra-structure
 - Reporting
 - Financial
- (iii) Completion and Exploitation

4 **OTHER ASPECTS**

- European dimension
- Growth of expertise and resources
- Interaction between Academia and Industry

Appendix VIII

THE FUTURE OF EC R&D AND INDUSTRIAL POLICY CONFERENCE

Tuesday, 6 July 1993

Cavendish Conference Centre, London, W1

CHAIRMAN AND SPEAKERS BIOGRAPHIES

ADRIAN GRILLI

Colloquial introduction

Adrian Grilli is head of a small section in Department of Trade & Industry, Research & Technology Policy Division, responsible for co-ordinating DTI's interests in European Community R&D. Thus he has oversight of a range of activities including ESPRIT, RACE, TELEMATICS, BRITE-EURAM and ENERGY programmes.

In true Civil Service fashion therefore, he is a jack of all trades and master of none, denying detailed knowledge of anything in particular.

This however may not be entirely true, since he will admit to being a member of both the Institution of Mechanical Engineers and Electrical Engineers, and has had first hand experience attempting to reduce the noise and vibration levels of the Red Arrow buses on which some of you will have travelled to this meeting.

More formal introduction

Adrian Grilli is head of a small section in Department of Trade & Industry, Research & Technology Policy Division responsible for co-ordinating DTI's interests in European Community R&D. This includes ESPRIT, RACE, TELEMATICS, BRITE-EURAM and ENERGY programmes.

After graduating in Mechanical Engineering from Bristol University, Mr Grilli spent some time in R&D in the motor industry, followed by a short period in retailing electrical goods, before joining the Civil Service as a design approval engineer in the National Weights and Measures Laboratory. After a spell in the Information Technology Division, at the height of the microcomputer revolution, he was seconded to the Cabinet Office Science & Technology Secretariat for two years. Immediately prior to his current post, he conducted a number of reviews of the use of the radio spectrum in the UK for the Radiocommunications Agency.

DR NICHOLAS HARTLEY

Dr Nicholas Hartley graduated in Materials Science from the University of Sussex in 1968 and moved to the Harwell Laboratory in 1971, after completing a research thesis on brittle fracture, to work on advanced surface treatment technology.

After a period at the U.S. Naval Research Laboratory in 1981, he returned to Harwell as a member of the central Business Development Group covering technology transfer and European contracts. In 1986, he joined the European Commission's **BRITE** programme in Brussels and is currently responsible for a number of materials based projects in the **BRITE/EURAM** Programme 1989-1992 and for aspects of strategic planning and future directions in the Industrial and Materials Programme, 1991-1994 ("Brite-EuRAM II").

ALLAN MAYO

Alan Mayo is presently in the International Section of the Science and Technology Secretariat of the Cabinet Office.

His role is to co-ordinate UK Policies in relation to the Community Research and Development.

MICHEL CATINAT

Head of Unit for Information Technologies, Analysis and Strategy, DGIII, European Commission, Brussels

MADRON SELIGMAN

Education:

- 1926 - 32 Rokeby School, Wimbledon
- 1932 - 37 Harrow School Middlesex, Matric
- 1927 - 40 Balliol College, Oxford, M.A. in Science and P.P.E.

- 1936 - 37 Played Cricket at Lords for Harrow against Eton
- 1940 President of the Oxford Union
- 1948 Member of Olympic Games Skiing Squad in Switzerland

CAREER

- 1940 - 46 Major in 6th Armoured Divisional Signals in Africa, Italy and Austria

- 1947 Joined APV Company Ltd., Crawley, Sussex (Food Machinery manufacturers and Process Engineers.

- 1951 Managing Director of APV Paramount Foundry
- 1963 Managing Director of APV International
- 1972 - 83 Marketing Director of the APV Group (60 Companies worldwide with 14,000 employees)

- Also 1979 Member of the European Parliament for West Sussex
Member of the Committees for Energy, Research, Technology and Environment

- Rapporteur on 'The Plutonium Cycle' Energy from Biomass, Gas Transit, The THERMIE Programme, Milk Processing Standards, Food Irradiation.

DIANA ROWEN

Diana Rowen was educated at Stanford University where she received a BSc in engineering. After working several years in the computer industry, she continued her education at Harvard University receiving an MA in public policy. From 1988 to 1991 she worked in the Executive Office of the President in Washington DC where she was a senior regulatory analyst in the Office of Management and Budget. In 1992 she joined the European Policy Forum as a Research Fellow.

DIRK F HUDGIG

ICI CAREER INFORMATION

- 1970 Joined ICI Holland B.V. as Publicity and Sales
 Promotion Manager
- 1974 Market Development Manager
- 1976 ICI London Headquarters to head ICI Europe Division
 Liaison Office
- 1978 Brussels European Headquarters as PR and Publicity
 Manager for Continental Western Europe
- 1982 Regional Manager Europa ICI Security Systems to
 start up new business for ICI Aerospace Division
 (USA)
- 1987 Manager EC Government Relations

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Cercle Gaulois Brussels

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Amsterdam SRO Marketing 1969

DR BRIAN ISHERWOOD

Joined the staff of the GEC Hirst Research Centre in 1965 after obtaining a B Tech Hons degree in Applied Physics at Brunel University. Awarded PhD in 1970 and the Charles Vernon Boys Prize of the Institute of Physics in 1982. A Founder Member and past Vice President of the British Crystallographic Association and first Chairman of the BCA Industrial Group.

Current position is as Assistant Director: Materials Technology of the Hirst Research Centre, the Central Research Laboratory of GEC plc. Materials Technology is a multidisciplinary Unit undertaking a broad range of activity spanning rapid response product support and consultancy to long-term R & D.

IAN CATLING

Ian Catling is a software and transportation consultant with 23 years' professional experience in Government, the computer services industry and consultancy. He established the Ian Catling Consultancy (ICC) in 1983 and has become recognised worldwide as an expert in the application of Information Technology to transportation, now known in Europe as Road Transport Informatics (RTI) or Advanced Transport Telematics (ATT). ICC is particularly active in the European research programmes DRIVE and PROMETHEUS.

THE FUTURE OF EC R&D AND INDUSTRIAL POLICY CONFERENCE

TUESDAY, 6 JULY 1993

CAVENDISH CONFERENCE CENTRE - LONDON

D E L E G A T E L I S T

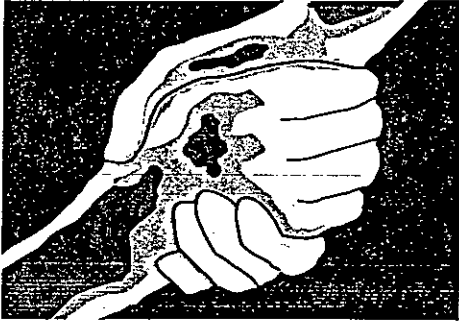
ALEMANY	David	Chairman	Madrid University c/o EUROTEAM, Univ of Leicester
ALEXANDER	Prof Errol	Director of Research	Profiles Research International
BAMFORTH	Dr C W	EC Liaison Officer	BRF International
BARJONAS	Laura	Principal Research Officer	University of Leeds
BARRY	Terry	Lecturer, Economics Dept	Borough of Croydon
BASI	J	Economic Development	Edinburgh University
BATT	S R	PA to Senior Executive	Devon County Council
BAX	Alex	Head of JTRC	London Research Centre
* BEEVERS	Prof A	Hanson Prof of Metallurgy	Oxford Brookes University
BELL	Prof T	Head of Management Accounting	University of Birmingham
BENJAMIN	Barry	Senior Lecturer	University of The West of England
BETTS	Dr Martin	Senior Scientific Officer	University of Salford
BHAT	Dr K M	Vice Chairman	AFRC Institute of Food
* BOMBER	Tony	Section Manager	The Academic Industry Links Organisation
BOWSHER	Dr B R	European Officer	AEE Winfrith
BOYES	Steven	Innovation Project Manager	Doncaster MBC
BRADSHAW	Dr Neil	Assistant Director for Science	Lancashire Enterprises Plc
BROCK	Christopher	Director of Research & Scientific Services	Flour Milling and Baking Research Association
BUCHANAN	Dr D J	Business Development Manager (EC)	British Coal Corporation
BUCKLE	A E	Director Research	Central Science Laboratory
CALDEIRA-SARAIVA	Dr F		British Maritime Technology Limited
CALLOW	G D		The Motor Industry Research Association
CANNELL	Dr David	Technical Executive	Morgan Matroc Ltd, Unilator Division
COLLINS	Stuart	Sales Manager	Dowty Fuel Systems

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CONNOR	H	Group Licensing Controller	Johnson Matthey Technology Centre
COOPER	Marc-Philippe	Marketing Manager	Luton College of Higher Education
COWLES	John	Director	CSM Associates Ltd
DAVIES	D G	Marketing Coordinator	Husat Research Institute
DAWSON	Dr H	SEO	NERC
DISNEY	Dr P	Deputy Director	University of Surrey
EATON	Dr Keith	External Contract	The Steel Construction Institute
EDWARDS	D M	Information Systems Support Officer	BP International Ltd
ESHELBY	Elaine	Principal Entohologist	Kent County Council
EVANS	Dr H F	Research Manager	Forestry Authority Research Division
FAN	Dr I P-Shing	Business Manager	The CIM Institute
FARRER	Andrew	Head of Division	Symbolics Limited
FLEMING	Dr J S	Principal Lecturer	University of Strathclyde
GABBITAS	Dr B L	Special Projects	Southbank University
GIBBS	Dr Paul	Business Development Manager	Leatherhead Food Research Association
GOODALL	Alex	European Officer	AI Intelligence
GOODE	G A A	R&D Coordinator	British Glass Manufacturers Confederation
GOODENOUGH	Catherine	EC Liaison Officer	Cardiff Institute of Higher Education
GREENWOOD	B D	AR Manager, DIP	International Wool Secretariat
GRIFITHS	Martin	Manager	University of Strathclyde
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HILL	Mark	Commercial Manager	Borough of Croydon
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HOPKINS	A	Academic Collaborations Manager	AFRC Institute of Food Research
HOUGH	Mrs Brenda	Senior Lecturer	The University of Hull
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HUNTINGDON	Derek	Co-ordinator International Affairs R&T	Building Research Establishment
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IRELAND	Paul	European Officer	British Gas Plc
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KERR	Dorian	External Collaborations Manager	MAFF
LAILLER	C J	Professor of Textile Engineering	Imperial College
LAWRENCE	Dr Dale	Higher Scientific Officer	ICI Chemicals & Polymers Ltd
LOWE	C A		University of Leeds
	Gillian		Health and Safety Executive

MAILEY	Nicky	
MAXWELL	Rachelle	Director, EURO-TEAM
MCARDELL	Dr Judy	Project Coordinator
MCGRATH	David	
MOYSE	Dr R	Collaborative Research Manager
MURRAY	R	Contracts Officer
MYERS	Colin	Consultancy Manager
NORTON	Dr H	Co-ordinator
PARKIN	Prof R	Dept of Mechanical & Manuf Eng
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POWER	Julia	European Funding Officer
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ROBERTS	Dr I	Director of Research Development
ROBERTS	N J	Director
ROBIN	Nicholas	International Liaison
ROSSERT	B	Consultant
SATCHELL	D W	Consultant
SCHLIEPER	Franceen	European Officer
SEARLE	Steve	Head of Business Development
SEWARD	I	R&D Manager
SHARPE	Mike	Senior Consultant
SMITH	Dr P C L	Deputy Director, Biotechnology Directorate
SPEERS	Prof G C	European Affairs Consultant
ST JOHN	Judy	Audit Officer
STANDING	Dr H	Researcher/Consultant
STEWART	Dr A M	Director, Tech Transfer
SWAN	Dr James	Operations Director
TABBUSH	Paul	Principal Silviculturist
TAYLOR	Garth	Development Manager
TAYLOR	John	Principal Lecturer in Building
UCHIBORI	H	Economic Analyst
WADE	Richard	Division Head
WAHALL	David	Marketing Manager
WHITE	Allison	Manager
WHITTLE	Dr Kevin	Forestry Research Station
WILLIAMS	Susan	
WILLIAMS	Dr David	Assistant Registrar
WRIGHT	Dr J R	Lecturer, Dept of Engineering
YIASEMIDES	G	Manager
YOSHIDA	M	Senior Manager
YOUNG	Prof Stephen	Head of Marketing Department

DTI - NW	
University of Leicester	
CAMR	
Oxford Computer Consultants	
Harlequin Ltd	
Forestry Commission Research Division	
Ricardo Hitec Ltd	
University of London	
De Montfort University	
Sheffield University	
South Bank University	
AEA Technology	
Manchester Metropolitan University	
Mineral Industry Research Organisation	
Brinsbury College	
MERA	
Druck Ltd	
Dundee University	
British Aerospace, Sowerby Research Centre	
Hepworth Minerals & Chemicals Ltd	
ECOTEC Research & Consulting Ltd	
SERC	
Queen Mary & Westfield College	
IANPOL Ltd	
The Tavistock Institute	
Dundee Institute of Technology	
P S W R Ltd	
Forestry Authority Research Division	
SOLOTEC	
University of Glamorgan	
Fuji Research Institute	
SERC	
Central Veterinary Laboratory	
University of Sussex	
MAFF	
European Information Service	
University of Newcastle Upon Tyne	
University of Manchester	
CERAM Research	
NTT Europe Ltd	
University of Strathclyde	



EUROPEAN COMMUNITY R&D INFORMATION PACK

GENERAL INFORMATION

Name	Sheet Number
European Community Research and Development - EC R&D	EC R&D2
Applying for project funding	EC R&D3
EC Industrial R&D - Who Does What	EC R&D4
Other European Initiatives and Mechanisms	EC R&D5
Acronyms used in EC R&D	EC R&D6
Case Study (1)	EC R&D7
Case Study (2)	EC R&D8

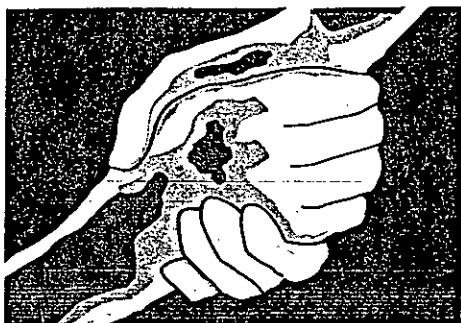
PROGRAMME INFORMATION

Name	Sheet Number
ESPRIT European Strategic Programme for Research and Development in Information Technology	EC R&D9
RACE Research and Development in Advanced Communications Technologies in Europe	EC R&D10
The Telematics Programme General	EC R&D11
AREA 1 Support for the Establishment of Trans-European Networks between Public Administrations	
AREA 2 Transport Services (DRIVE)	
The Telematics Programme AREA 3 Health Care AREA 4 Flexible and Distance Learning (DELTA)	EC R&D12

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the department for Enterprise



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Biomedical and health research	133	18
Life sciences and technologies for developing countries	111	15
5 Energy		
Non-nuclear energies	157	110
Nuclear fission safety	199	29
Controlled nuclear fusion	458	110
III Management of Intellectual Resources		
6 Human capital and mobility		
Human capital and mobility	518	69
TOTAL	5,700	900

The UK played a major role in defining the technical content and objectives of the individual programmes within the new Framework. The focus of the industrial programmes continues to be on pre-competitive research, in particular research leading to the development of standards and codes of practice. The programme will complement activities being carried out under EUREKA, which is a Pan-European initiative to encourage collaboration on industry-led market driven projects.

The industrial programmes primarily operate as shared cost activities, ie the Commission provides up to 50% of the funding with participating organisations providing the balance. Non-industrial participants in some programmes can opt for 100% of marginal costs instead. A second approach is the use of the Community's own research organisation, the Joint Research Centre (JRC) which was set up under the Euratom Treaty and comprises four separate laboratories. Thirdly, concerted action has a similar collaborative format to much of the shared cost action except that the Community's funds are used primarily to provide a central co-ordinating secretariat, whilst R&D costs are covered by other participants or, if appropriate, by their national governments. By far the most widespread and best known of the Community concerted action activities has been the COST programme in which non-Community countries may participate with the EC Member States on an equal basis.

Benefits to UK Participants

International technological collaboration is becoming increasingly important to UK industry. It is clear that for many sectors the UK's main thrust must be towards Europe if we are to exploit the Single Market and compete with Japan and the United States. Through competition users and suppliers benefit from European markets and increase their international competitiveness - given that the effect of competition is to act as a spur towards innovation. European collaborative research can help both by encouraging industry to carry out more research leading to innovative products and by developing through standards more open markets which increase competition in Europe and hence industry's own competitiveness. It is primarily a matter for industry to decide whether collaboration is appropriate in specific cases. DTI's policy towards EC R&D is based on the clear views from industry of the type of collaboration likely to be cost effective and

beneficial to the competitiveness of UK industry. Firms which decide to participate have often realised substantial benefits as shown below:

- (i) they are able to share the cost and risks of R&D, making use of complementary skills and common facilities, so that they can participate in projects where the scale of investment would otherwise be beyond their resources;
- (ii) they can gain commercial advantage from tapping into the technological expertise of firms in other European countries;
- (iii) they may achieve a more significant role in the development of international standards for their industry, helping to ensure that a world standard is generated by Europe;
- (iv) they are able to establish broader business contacts with their overseas counterparts so that they are well placed to take advantage of the completion of the Single Market.

Other factors

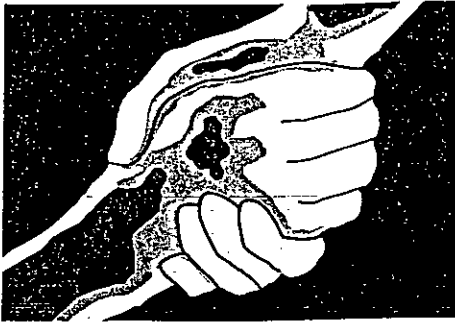
Being part of an international collaborative venture does create additional overheads which should be taken into account by potential industrial participants:

- (i) setting up international projects within a programme takes time and considerable expense, often due to the sheer size and complexity of the problem at hand. The expense of preparing a proposal must be met by the proposers;
- (ii) once the work has begun it often proves expensive to co-ordinate the work of widely spread research teams and to liaise with the Commission;
- (iii) because EC programmes involve pre-competitive R&D, it is often the case that larger firms which have research programmes of comparable timescale to EC R&D programmes are likely to benefit most. However, DTI actively encourages firms of all sizes to participate in EC R&D, and there is significant participation by SMEs in some industrial programmes.

These factors can be particularly important to SMEs which may not be able to devote large resources to their participation. Small firms may therefore find it useful to pool resources before seeking other European partners, either by joining up with a large UK firm which has the necessary resources or through consortia of small firms, possibly involving a Research Association or laboratory able to provide a point of focus and specialist help. EC pre-competitive programmes exclude activities covering near-market product or process development. However, if a firm feels that international collaboration is appropriate but not through EC programmes, then other possibilities should be explored, such as through existing business contacts or under a scheme such as EUREKA.

Companies should be aware that the programmes are often oversubscribed. A company or other organisation intending to participate in the Framework Programme should also be aware from the outset that

preparing a suitable research proposal can be both time consuming and expensive. After saying all this, it is worth pointing out that the benefits from participating in EC R&D programmes are often very great and in most cases greatly outweigh the costs of participation.



EUROPEAN COMMUNITY RESEARCH AND DEVELOPMENT — EC R&D

Introduction

Each Member State maintains its own national R&D effort and collectively this effort is the main thrust of Europe's mastering of new technologies. However, because each State cannot hope to underpin the R&D necessary to meet the challenge of aggressive markets like Japan and the United States alone, a common approach to the fields of science and technology is increasingly important. Its cornerstone is the Community's R&D effort.

EC R&D programmes are funded from the Community's own resources (ie the external tariff, VAT levy), and are planned and managed by the European Commission staff in Brussels. The size, scope and annual budget of the programme are approved by the Ministers of Member States, usually through meetings of the Research Council. The Community's programmes aim to assist industry to improve Europe's technology base and to assist firms in exploiting the internal market. In practical terms this largely amounts to international collaboration on R&D projects partly funded by industry and involving industries, universities and other organisations working together across Europe. The emphasis is on pre-competitive research, which usually lies beyond basic research but does not specifically involve near-to-the-market developments.

The Growth of EC R&D

EC R&D appears to be a relatively new Community activity, but in fact it goes back a long way. Nuclear energy research was first carried out under the 1956 Euratom Treaty, together with a limited amount of research in the European Coal and Steel Community. There was, however, non-nuclear energy research from the 1970s and a determined effort in the 1980s to widen the range of activities. The "second generation" of EC R&D, effectively summarised by the strategy of the Community's first R&D Framework Programme (1984-87), attempted to work towards a fairly even coverage of energy, environment, industry, agricultural raw materials and other R&D areas judged to be important to the Community as a whole. The Community entered a "third generation" of R&D activities with the second R&D Framework Programme (1987-91).

EC R&D Today

The third Framework Programme (1990-94) was agreed at the December 1989 Research Council in Brussels and formally adopted in April 1990. In line with earlier Framework Programmes this is not just a research programme, but a five year strategy which lays down objectives, devises priorities and fixes the overall level of funding deemed necessary to undertake the specific R&D programmes by which it will be implemented. This programme will extend the concept of overlapping 'rolling' R&D programmes in order to provide the flexibility needed to respond to the dynamic nature of technological development today. Enabling technologies for industry will still receive the majority of resources, but significant new priorities are reflected in the resources devoted to environmental research, biotechnology and agro-industrial research. All these Community activities will continue to focus primarily on priority areas of pre-competitive R&D, and will complement other forms of European collaboration such as EUREKA and COST, as well as specialised activities such as those undertaken by the European Space Agency and other commercial product-targeted schemes.

Member States' Role in EC R&D Programmes

Commission proposals for a specific EC R&D programme require approval by the Member States at Ministerial level as well as approval by the European Parliament. The Ministers generally consider such proposals at meetings of the Research Council. Thus national governments have a substantial voice in the content, direction and operation of these programmes.

Member States also play an active role in the more day-to-day running of the programme through a series of Official Committees. In 1984, 12 Management and Co-ordination Advisory Committees (CGCs) were set up, each with the interest of a particular sector of R&D, to advise the Commission on all aspects of the activities within that sector. These committees are made up of the representatives of the Member States and the Commission, and meet regularly in Brussels, Luxembourg or the Joint Research Centre (JRC) laboratories to discuss, amongst other things, the specific EC R&D programme within their areas. The Member States' representatives are usually government officials or nominated experts of interested bodies in the UK, who influence the running of the various

programmes by making their views known to the national delegates.

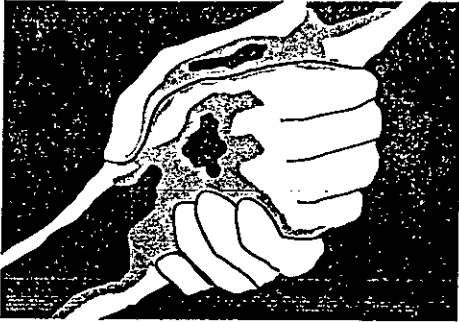
For the large information technology and telecommunication programmes, management committees have been set up consisting of Member States, representatives and chaired by the Commission. These implementing committees have considerably more power than CGCs, and are responsible for approving budgets, annual work programmes etc. In future these and other programmes will have similar committees, so that Member States continue to have a strong voice in the direction of the programmes.

1990-1994 Framework Programme

A new EC R&D Framework Programme was agreed at the December 1989 Research Council in Brussels. It is the "third generation" of EC R&D programmes and involves funding of 5.7 BECU (£4.2Bn). In December 1992 the Research Council agreed a "top-up" to the original funding. The programme runs from 1990-1994, covering research in the following areas:

Action Lines	Original funding	
	MECU	Top-up MECU
I Enabling Technologies		
1 Information and communications technologies		
Information technologies	1352	180
Communications technologies	489	65
Development of telematics	380	51
2 Industrial and materials technologies		
Industrial and materials technologies	748	99
Measurement and testing	140	19
II Management of Natural Resources		
3 Environment		
Environment	414	55
Marine sciences and technologies	104	14
4 Life sciences and technologies		
Biotechnology	164	22
Agricultural and agro-industrial research	333	44

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APPLYING FOR PROJECT FUNDING

An R&D project for EC support goes through five phases:

phase 1. Preparation and Submission. The phase when project ideas are developed, the consortium formed, the work planned and the proposal document written;

phase 2. Independent Assessment. The Commission arranges for all proposals to be assessed by panels of experts;

phase 3. Contract Negotiation. Once a proposal has been selected for funding, the consortium then enters into contract negotiations with the Commission;

phase 4. Project Execution. The Phase when research is undertaken. During this phase the Commission undertakes monitoring activities to ensure satisfactory performance;

phase 5. Industrial Exploitation. This is the ultimate longer term objective of Community R&D programmes.

Preparation and Submission

The Commission's collaborative research and development programmes are implemented through shared cost projects. These projects are normally industry led and are formulated in response to a Call for Proposals.

Full details of the technical areas and priority themes identified by the Commission are contained in an information package along with guidance on how to prepare and deliver the proposal by the due date to the Commission in Brussels. It is important to have the correct Information Package as these are updated for each new Call for Proposals.

Liaise closely with the Commission and DTI Programme Managers at the earliest opportunity. It can take several months to prepare a proposal. Avoid eleventh hour decisions. In preparing your proposal you should note the following points, although they are by no means exhaustive:

- The contents of the Information Package should be studied carefully as it is an important guide to what the Commission is looking for. Innovative projects consistent with the technical areas and priority themes identified will have the best chance of success;

- Proposals must satisfy the assessment criteria described in the Information Package;
- Background research is required to ensure that similar ideas are not being addressed in existing projects;
- Identify complementary projects which might provide useful results;
- Normally once a year the Commission organises a Proposer's Forum in Brussels. This event provides prospective participants with an opportunity to meet the Commission staff who run the programme. It also provides an opportunity to make contact with potential project partners;
- The Commission is able to assist with identifying potential partners. Expression of Interest forms are provided in the Information Package, and summaries of completed forms are available on request;
- DTI staff may also be able to direct companies towards potential partners;
- An outline of the proposed project is required for preliminary discussions with the Commission;
- The Commission and DTI staff can provide useful guidance on how to prepare a successful proposal;
- Once a consortium has been assembled each partner should prepare a short document describing the work they want to do. The consortium should also agree at this point which partner will lead the project as the prime proposer;
- One person from the prime proposer should write the draft proposal documents and act as project champion and driver. A consortium meeting should be held to discuss the details of the draft;
- If time allows, a copy of the draft proposal should be shown to the Commission staff for comment. An independent consultant may also be considered worthwhile.
- The proposal should be submitted on time, in accordance with the published closing date.

Independent Assessment

The Commission will arrange for proposals to be assessed by a team of independent external evaluators. The evaluators are experts drawn from

industry, universities and research institutes. These individuals are appointed on the basis of their expertise and not as representatives of their organisation or country. Commercial confidentiality of the proposals is ensured.

The assessment has two main objectives:

- to carry out a thorough assessment of the proposal and to make a recommendation on its merits and on the action that should be taken;
- to select projects so that all the Technical Areas are covered and to make the best use of funds.

A project proposal is submitted in three physically separate parts. Part I contains administrative and financial data. Part II contains the technical details of the proposal, along with the proposed work plan and sections addressing expected industrial benefits, project management techniques, etc. Part III gives partnership details and details of intentions and plans concerning the commercial exploitation of the results of the project.

The assessment of the proposal is carried out in four stages.

First the Commission's staff verify the eligibility of the proposal using Part I (Administrative and Financial Data). This part of the proposal is not seen by the independent experts. Assessment of Part I is based upon eligibility criteria for participation in the Programme.

Secondly Part II (Technical and Management Details) is assessed by the independent experts. To ensure an unbiased assessment this part must not identify any of the proposers by name. Each proposal will be assessed by at least three experts working independently. Part II is evaluated against criteria such as conformity with the Programme Technical Areas and Priority Themes, scientific merit and technical innovation, and the economic importance to the Community.

Only when the experts have assessed Part II will they have access to Part III (Partnership Details). Assessment of Part III is based on criteria concerned with the roles and experience of partners, and the exploitation of results.

The criteria used in the assessment of each part of the proposal are listed and explained in the Information Package.

At the third stage of the assessment the overall merit of individual projects is discussed by the expert group. Projects are then given one of the following ratings:

- A strongly recommended for funding without modification to the proposed project;
- B strongly recommended for funding with modifications to the proposed project;
- C recommended for funding without modification to the proposed project;
- D proposed project not recommended for funding because major changes are necessary;
- E proposal of low quality or not relevant to the programme.

The fourth stage of the assessment procedure is the final selection of projects based on the recommendations made by the external independent assessors and the programme budget available.

The assessment phase is the only part of the project life cycle when the consortium has no direct part to play. The only way that the consortium can influence the assessment and selection is by having innovative ideas and writing a good proposal. In practice the most important parts of the proposal are the first few pages of Part II (ie the Summary, Objectives and the Economic and Technical Benefits). If these three sections are poorly written and do not give a favourable initial impression, then it is less likely that the project will be rated very highly. This does not mean that the quality of the ideas and the remainder of the proposal are unimportant. What is important is to create a good first impression and to 'sell' the ideas to the assessors.

Success in the assessment and selection phase can only be secured through the quality of the proposal.

This requires:

- innovative ideas;
- conformance with the Priority Themes in the current Information Package;
- realistic objectives;
- quantification of technical goals;
- sound management methods;
- the right consortium for the project;
- consistency with partners' overall strategies;
- potential benefit to the Community from industrial exploitation of results;
- clear and precise presentation.

Contract Negotiation

The partners in a successful proposal will receive a letter inviting them to the Commission to negotiate a contract. The negotiations on all aspects of the project may take some months, depending on the difficulties encountered. Work on the project cannot commence until this contract has been signed by all the parties involved.

Contract negotiations centre around reaching agreement on responsibilities of the partners, ownership, exploitation and dissemination of

results, monitoring and reporting on the project, financial considerations, etc. The Commission may also ask for some changes to the project based upon the recommendations of the assessors, and these also need to be negotiated with the Commission. The contract that is agreed with the proposers of a selected project will be based on a standard form of contract which includes a technical annex based on the proposal document and standard conditions.

You should note that:

- if contract negotiations do not lead to agreement on contract terms and conditions, your project will not be funded;
- the expenses incurred in negotiating a contract have to be met by the consortium and cannot be recovered from the Programme.

Project Execution

Once the contract has been signed the project enters the start-up stage. This is a crucial time for the project. It is at this stage that the partners may appreciate for the first time the complexities of working on an international project.

The start-up stage is a time for learning about your partners' working methods and understanding more about their motivation and goals. It is a time for getting to know people and developing one to one working relationships.

It is also a period when partners realise that a considerable amount of time has to be devoted to travelling and participating in project meetings.

There is always the temptation to minimise the number of these meetings. This is not recommended. Not only may you fail to reap the full benefits from the project, but you will also possibly end up with a less well integrated research effort. The time devoted to direct dialogue with partners is usually well worth the effort, although in the early stages it may seem that the time could be better invested in doing 'research'.

Project management is also a time-consuming activity, but one that is essential to the success of the project. The time that has to be spent on this activity should not be under-estimated. An international project is much more difficult to deal with than a national one or an internal project. It is more demanding in terms of time and diplomatic skills, and involves more paper work. There will be the usual internal reviews and liaison with partners. Reports also have to be prepared for the Commission.

The arrangements for monitoring of the project by the Commission will be specified in the contract. This may include visits to the partners' premises, in addition to regular progress meetings in Brussels. Regular written progress reports are required. A brief report is normally required every six months, and a full report every twelve months. A final report has to be prepared at the end of the project. Cost statements also have to be submitted every twelve months. The Commission also requires non-confidential summary reports on an annual basis for the purposes of disseminating research results more widely.

Industrial Exploitation

The Commission will expect your consortium to pursue the development of the project, after its formal completion, through to the stage of industrial exploitation. Intentions with respect to exploitation are included in Part III of the proposal. The conditions applying to ownership, exploitation and dissemination of project results will be described in the contract.

The industrial property generated under the contract is owned by the partners, and they are responsible for reaching agreement among themselves on its use. A partner must grant licences, usually free of royalties, to other partners where this is necessary for the effective development of the project and for subsequent exploitation of the results.

Exploitation of the results must commence within a reasonable period of time. This can be agreed with the Commission at the stage when the final report is being drafted. Although the confidentiality of all commercially sensitive information is guaranteed the partners in the project must allow the results of the research to be disseminated by the Commission.

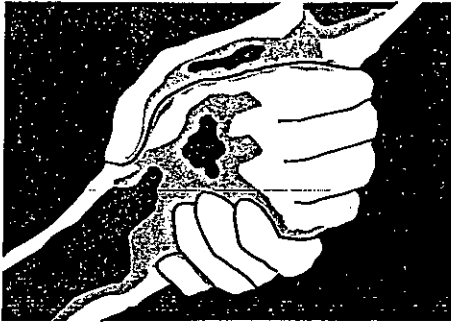
Summary

When writing the project proposal make sure that you:

- allocate adequate resources for travel and project management;
- design your work plan to include collaborative tasks in the early stages of the project that will contribute to consortium building.

In the start-up stage of the project you should:

- hold regular meetings and workshops with your partners;
- ensure that you improve your understanding of your 'partners' working methods and objectives.



EC R&D - WHO DOES WHAT?

Information and Advice on EC R&D Programmes

Information on the various EC R&D programmes is available from the Commission itself in Brussels and from its offices in the UK, the address of which are shown below.

Headquarters:

Commission of the European Communities
Rue de la Loi 200
B-1049 BRUSSELS
Tel: 010-322 295 1111

UK Offices:

8 Storey's Gate
LONDON SW1P 3AT
Tel: 071-973 1992

4 Cathedral Road
CARDIFF CF1 8SG
Tel: (0222) 371631

7 Alva Street
EDINBURGH EH2 4PH
Tel: 031-225 2058

Windsor House
9-15 Bedford Street
BELFAST BT2 7EG
Tel: (0232) 240708

In addition, various publications are produced by the Commission which disseminate information on a wide scale; notably the monthly Official Journal which contains useful information and calls for proposals etc.

The Department of Trade and Industry (DTI) plays a major role in the UK in providing advice and information to UK industry and research establishments about the industrial programmes (now over 50% of the total), and in disseminating information arising from the running of these programmes. DTI is divided into divisions, each with responsibility for specific areas of work. Many of these divisions have a major interest in EC R&D in general, or in particular EC R&D programmes relating to their own area of concern.

Research and Technology Policy Division (RTP)

RTP Division is DTI's central co-ordinating division on S&T matters. It has an EC R&D section which contributes towards the formulation of UK policy, provides advice and assistance where necessary and liaises with other divisions on all industrial EC R&D issues. RTP Division therefore provides a good starting point for general enquiries.

Contact point for EC R&D General Enquiries

Mr S France
3rd floor
151 Buckingham Palace Road
LONDON
SW1W 9SS
Tel: 071-215 1611

Regional Offices

DTI has regional offices throughout the UK which help to promote enterprise and improve industrial awareness and competitiveness in their local area. Many industrial firms in the UK have regular contact with their regional offices on DTI activities and the office will be able to provide similar advice on EC programmes; suggesting particular R&D programmes which might be of interest and putting other firms or interested parties in touch with the relevant contact point within DTI. Regional Office addresses are listed below:

Dr K J Coleman
DTI North East
Stanegate House
2 Groat Market
NEWCASTLE UPON TYNE
NE1 1YN
Tel: 091-232 4722

Mr R Landeryou
DTI South East
Bridge Place
Eccleston Square
LONDON
SW1V 1PT
Tel: 071-215 0560

Mrs N Malley
DTI North West
Room 1920
Sunley Tower
Piccadilly Plaza
MANCHESTER
M1 4BA
Tel: 061-838 5315

Mr R Mooney
DTI East
Building A
Westbrook Research Centre
Milton Road
CAMBRIDGE
CB4 1YG
Tel: (0223) 461939

Mr M Doxey
DTI Yorkshire and Humberside
Room 102
25 Queen Street
LEEDS
LS1 5LF
Tel: (0532) 443171 (ext.217)

Mr C Marston
DTI East Midlands
Room 306
Sevens House
20 Middle Pavement
NOTTINGHAM
NG1 7DW
Tel: (0602) 506181 (ext.335)

Mr R Fenley
DTI West Midlands
6th Floor
77 Paradise Circus
Queensway
BIRMINGHAM
B1 2DT
Tel: 021-212 5144 (ext.5176)

Mrs M Hildebrand
Scottish Office/Industry Department
Room 604
Alhambra House
45 Waterloo Street
GLASGOW
G2 6AT
Tel: 041-248 2855 (ext.5549)

Dr T Courtney
Department of Economic Development
Technology Division
Northern Ireland
IDB House
64 Chichester Street
BELFAST
BT1 4JX
Tel: (0232) 234488 (ext.2480)

Mr I Dixon
Welsh Office/Industry Department
BSU Division
Cathays Park
CARDIFF
CF1 3NQ
Tel: (0222) 825111 (ext.3678)

Mr C Buckel
DTI South West
Room 537
The Pithay
BRISTOL
BS1 2PB
Tel: (0272) 272666 (ext.475)

Other Divisions

As outlined above, various DTI divisions have a specific interest in particular EC R&D programmes and take the lead with regard to UK involvement. Details of these programmes and DTI contact points can be found in the Programme Information Sheets opposite.

Other Government Departments

The Office of Science and Technology in the Cabinet Office acts as the central UK coordinating body for all the EC R&D programmes as they cover a wide range of interests which fall within the responsibility of a number of UK Government Departments. This is necessary to ensure that the UK takes an overall balanced and co-ordinated approach to EC R&D whilst maintaining effective links between EC and UK programmes.

Contact

Mr R Caniff
Cabinet Office
Room 421
70 Whitehall
LONDON
SW1A 2AS
Tel: 071-270 0367

Mr Wilson
DoH
420b State House
High Holborn
LONDON
WC1R 45X
Tel: 071-972 3946

UK Relay Centre Enquiry Lines

A network of Relay Centres has been set up throughout the EC, to promote the Community's R&D programmes, to help organisations participate in these programmes and to ensure that the results arising from projects are disseminated and exploited. The Centres were set up in January 1993. There are four Relay Centres in the UK, each serving primarily one region of the UK:

Relay Centre for Wales

David Harris or Brian Dormond
Welsh Development Agency
QED Centre
Main Avenue
Treforest Industrial Estate
Pontypridd
CF37 5YR
Tel: (0443) 841345
Fax: (0443) 841393

Relay Centre for Northern Ireland

Kevin Dunwoody
LEDU - Small Business Agency
LEDU House
Upper Galway
Belfast
BT8 4TB
Tel: (0232) 491031
Fax: (0232) 691432

Robert Bunn
Dept of Economic Development
Industrial Research and Technology Unit
Netherleigh
Massey Avenue
Belfast
BT4 2JP
Tel: (0232) 764244
Fax: (0232) 768857

Relay Centre for Southern and Central England

Maureen Firlej
The Technology Broker
Station Road
Long Stanton
Cambridgeshire
CB4 5DU
Tel: (0954) 61199
Fax: (0954) 60291

Relay Centre for Scotland and Northern England

Co-ordinating Partner:
Ian Traill
EuroInfo Centre Ltd
Atrium Court
50 Waterloo Street
Glasgow
G2 6HQ
Tel: 041-221 0999
Fax: 041-221 6539

Highlands and Islands of Scotland:

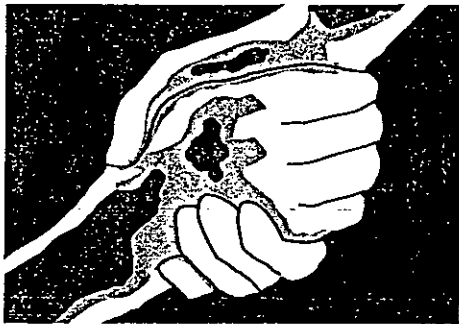
Roddy Dyce
Business Information Source Ltd
Bridge House
20 Bridge Street
Inverness
IV1 1QR
Tel: (0463) 715400
Fax: (0463) 715600

Central, Southern and North East Scotland:

Jonathon Shackleton
Technology Transfer Centre Ltd
43 Falkland Street
Glasgow
G12 9QZ
Tel: 041-339 5010
Fax: 041-339 8787

Northern England:

Joan Duffin Regional Technology Centre North
Unit 3D
Hylton Park
Wessington Way
Sunderland
SR5 3NR
Tel: 091-549 8299
Fax: 091-548 9313



OTHER EUROPEAN INITIATIVES AND MECHANISMS

There are several European initiatives for technological collaboration other than those organised by the European Community. These have arisen from the recognition of the need to spread development costs and risks and from a general desire to improve European capability and competitiveness in the field concerned. In addition, a number of other Community activities have recently emerged which to some extent augment the EC R&D programmes by utilising structural funds to promote initiatives which foster innovation and technological advance in the Community's less favoured regions. A brief summary of the most relevant of these initiatives and mechanisms is given below; more detailed information is available from the contact points listed.

1. EUREKA

EUREKA is not a European Community Programme but a framework for industry-led projects aimed at producing high technology goods and services to compete in world markets against the US and Japan. These projects are normally downstream of, and complementary to, EC programmes.

There are 20 participating countries including the 12 EC Member States plus Austria, Iceland, Switzerland, Sweden, Norway, Turkey, Hungary and Finland. The EC Commission itself is also a EUREKA participant. Activities are carried out in a wide range of advanced technologies such as information technology, telecommunications, robotics, materials, advanced manufacturing, biotechnology, lasers and others.

Projects are proposed and run by firms and research institutes and bureaucracy is kept to a minimum with Governments providing an information matchmaking network and market openings. These allow project partners to seek political support for removal of relevant trade barriers. Public funding is at the discretion of national governments. In the five years following its launch in 1985 EUREKA has embraced 7.8 BECU (£5.8bn) of agreed projects. The UK plays a large part in achieving its market-led orientation and UK industry is now involved in 170 out of the 623 projects; major examples being High Definition Television and the FAMOS project in flexible automated assembly. DTI is currently considering how best to promote increased involvement of UK organisations in EUREKA projects.

DTI Contact
EUREKA Office
Department of Trade and Industry
3rd Floor, Yellow Core
151 Buckingham Palace Road
LONDON
SW1W 9SS
Tel: 071-215 1616 or 1618

EUREKA Enquiry Point
Tel: 071-333 5161

See the EUREKA sheet (EC R&D23) for more details.

2. COST

Co-operation on Science and Technology (COST) is a concerted action programme which has as participants the EC Member States and several other European countries. Administration of the programme is carried out by the European Commission but research costs are the responsibility of participating firms or their national Governments.

More details can be found on the COST information sheet (EC R&D22).

3. European Space Agency

The European Space Agency (ESA) is not a Community institution. ESA has 13 member states; the EC countries (excluding Greece, Luxembourg and Portugal) plus Austria, Norway, Sweden and Switzerland. It was set up to promote cooperation among European states in civil space research, technology and space applications. Involvement in ESA gives the UK the opportunity to take part in projects that would otherwise be beyond the resources of the UK national civil space programme.

The work carried out by ESA is divided into six main programme areas. These are space science, microgravity, Earth observation, satellite telecommunications, space transportation systems and the Columbus space station. ESA operates a system of "juste-retour" whereby industrial contracts are awarded in member states in proportion to the level of their funding of ESA programmes. The UK's main funding goes to the ESA programmes on Earth observation, space science and satellite telecommunications.

The British National Space Centre represents the UK on the ESA Council and other delegate bodies.

Contact:
British National Space Centre
Dean Bradley House
52 Horseferry Road
London SW1P 2AG
Tel: 071-276 2688
Fax: 071-821 5387

4. The Council of Europe

The Council of Europe was founded in 1949 to achieve greater unity between its members and foster economic and social progress. It groups 25 European democracies including the UK. Scientific and technological activities are run by its Parliamentary Assembly, which now includes "special guest" delegations from 5 Central and East European countries. At present cooperation focuses on:

- renewable energy sources
- North-South technological transfers
- climate change
- bioethics

Contact:
Pat Ashworth
WED
Room W118
Foreign & Commonwealth Office
London
SW1A 2AH
Tel: 071-270 2408
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5. The European Science Foundation (ESF)

The ESF is an international non-governmental agency founded in 1974 and based in Strasbourg. It is made up of academics and research councils responsible for supporting scientific research. The ESF currently has 48 member organisations from 18 European countries including the UK and focuses on basic activities in all fields including the humanities and social sciences.

The ESF is designed to try to identify areas where international co-operation would bring the most benefit to European research and to provide the initial stimulus to the establishment of collaborative programmes. ESF funding is based on a general budget (contributed to by member organisations) and options to "buy into" certain activities.

CONTINUED

UK members include the Agriculture and Food Research Council, British Academy, Economic and Social Research Council, Medical Research Council, Royal Society and the Science and Engineering Research Council. The ESF covers many areas of interest but in the first instance you should approach your contact person in the Research Council with which you normally deal.

6. European Regional Development Fund (ERDF)

Several Research and Development programmes have been adopted under the auspices of ERDF, which aims to provide assistance for the Community's less favoured regions. These include STRIDE in declining industrial regions of Northern Ireland, which aims to strengthen the R&D capacity of the eligible areas. Also adopted are two programmes which apply in Northern Ireland only:-

- (i) PRISMA - aimed at providing calibration and accreditation facilities for SMEs;
- (ii) TELEMATIQUE - aimed at stimulating the supply and use of Advanced Telecommunications Service (ATS).

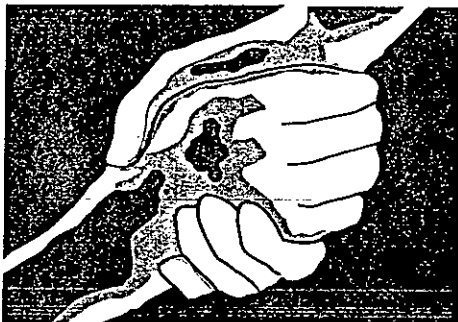
Although Northern Ireland is the only eligible area for PRISMA and TELEMATIQUE, there could be opportunities for companies in the rest of the UK to offer their services to areas that qualify for these programmes.

The normal EC Objective 2 Programmes provide grant to public sector bodies under their R&D "Priority Action", and there may be similar activity under Community Initiatives such as LEADER and RETEX.

If companies would like to benefit from specific grants from the ERDF then they should note that only specifically designated regions of the Community qualify, and those interested in participating would first need to check their eligibility and the types of activities receiving funding.

Contact

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Regional Development and Inward Investment
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SW1E 6SW
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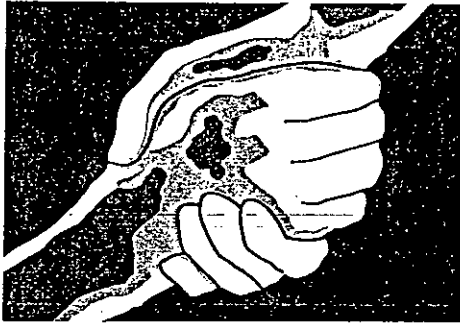


ACRONYMS USED IN EC R&D

ACPM	Advisory Committee on Programme Management	COREPER	Council of Permanent Representatives (of EC Member States)	ETW	European Transonic Windtunnel
AIM	Advanced Informatics for Medicine in Europe	COST	European Co-operation on Science and Technology	EUREKA	European Research and Co-ordination Agency
BAP	Biotechnology Action Programme	CREST	Scientific and Technical Research Committee (of the EC)	EUROTRA	Community R&D Programme for a Machine Translation System of Advanced Design
BCR	Bureau Communautaire de Reference (Community Bureau of Reference)	CUBE	Concertation Unit for Biotechnology in Europe	EVCA	European Venture Capital Association
BECU	Billion ECU	DELTA	Developing European Learning through Technological Advance	FAST	Forecasting and Assessment in Science and Technology
BEP	Biomolecular Engineering Programme	DEm	Department of Employment	FLAIR	Food linked Agro-Industrial Research
BICEPS	Bioinformatics Collaborative European Programmes and Strategy (forerunner of AIM)	DEn	Department of Energy	FOC	Fibre Optic Cable
BMFT	(German Federal Ministry for Research and Technology)	DES	Department of Education and Science	HDTV	High Definition Television
BNSC	British National Space Centre	DG	Directorate General (of the European Commission)	HEI	Higher Education Institution
BRIDGE	Biotechnology Research for Innovation, Development and Growth in Europe	DoE	Department of the Environment	HTM	High Temperature Materials Programme (at JRC Petten)
BRITE/ EURAM	Basic Research in Industrial Technologies for Europe/European Research in Advanced Materials	DRIVE	Dedicated Road Infrastructure for Vehicle Safety in Europe	IBC	Integrated Broad-band Communications
CADCAM	Computer Aided Design Computer Aided Manufacturing	DTI	Department of Trade and Industry	IPR	Intellectual Property Rights
CEC	Commission of the European Communities	EC	European Community	IRDAC	Industrial Research and Development Advisory Committee
CEN	Comite European de Normalisation (The European Committee for Standardisation)	ECLAIR	European Collaborative Linkage of Agriculture and Industry through Research	ISDN	Integrated Services Digital Networks
CEPT	Confederation of European Posts and Telecommunications	ECOSOC	Economic and Social Council	IT	Information Technology
CGC	Comite Consultatif de Gestion et Co-ordination (Management, Co-ordination and Advisory Committee)	ECU	European Currency Unit	JET	Joint European Torus
CIT	Committee for Innovation and Technology Transfer	EEC	European Economic Community	JRC	Joint Research Centre (of the EC)
CODEST	Committee for Development of European Science and Technology	EFTA	European Free Trade Association	MAFF	Ministry of Agriculture, Fisheries and Food
COMETT	Community Programme in Education and Training for Technology	EJOB	European Joint Optical Distability (project)	MAST	Marine Science and Technology
		EP	European Parliament	MECU	Million ECU
		ERDF	European Regional Development Fund	MEP	Member of the European Parliament
		ESA	European Space Agency	MoD	Ministry of Defence
		ESC	Economic and Social Committee	MONITOR	A Community Programme in the field of strategic analysis, forecasting and evaluation in matters of research and technology
		ESF	(i) European Science Foundation (ii) European Social Fund	MRC	Medical Research Council
		ESPRIT	European Strategic Programme for Research in Information Technology	NERC	Natural Environment Research Council

CONTINUED

NET	Next European Torus	STRIDE	Science and Technology Research into Innovative Developments in Europe
OECD	Organisation for Economic Co-operation and Development	TIP	Technology Integration Project
RACE	Research in Advanced Communications in Europe	UETP	University-Enterprise Training Partnerships (supported under COMETT)
RDP	RACE Definition Phase	UKAEA	United Kingdom Atomic Energy Authority
RMP	RACE Main Phase	UNICE	Union of Industries of the European Community
RTP	Research and Technology Policy Division (DTI)	VALOREN	Development of certain regions of the EC by exploiting indigenous energy potential (under the ERDF)
SERC	Science and Engineering Research Council	VALUE	Valorisation and Utilisation for Europe
SME	Small and Medium-sized Enterprise	VSLI	Very Large Scale Integration
SPRINT	Strategic Programme for Innovation and Technology Transfer in Europe		
STAR	Development of certain regions of the EC by improving access to advanced Telecommunications services (under the ERDF)		



Case Study: DRIVE

Ian Catling Consultancy

The Company

Ian Catling Consultancy is a small 5 man operation with a clear European dimension. Established in 1983, ICC has earned an international reputation as a leader in route guidance and driver information systems. ICC plays a prominent role within European research initiatives at management, specialist adviser and participant levels.

ICC has been involved in 4 EC R&D projects as the prime contractor and therefore has a great deal of European experience to share.

The Programme

DRIVE (or Dedicated Road Infrastructure for Vehicle safety in Europe) aims to contribute to the development of integrated trans-European services using IT and Communications to improve the performance (safety and efficiency) of passenger and goods transport services and at the same time reduce the impact of transport on the environment.

For more details on the DRIVE programme see under Area 2 Transport Services (EC R&D11).

The Project

SOCRATES - System Of Cellular Radio for Traffic Efficiency and Safety. This project aims to use cellular radio in an efficient way to exchange detailed digital information on traffic conditions with vehicles as they travel. Broadcast data is linked to data stored in the vehicle's navigation computer, which combines these sources to calculate the best route for the driver. The computer then speaks to the driver and provides easy-to-follow guidance to reach the destination in the most trouble-free way.

Pilot projects to demonstrate the feasibility of SOCRATES are being implemented in Gothenburg, the region around Frankfurt and in London as part of another DRIVE 2 project called LLAMD (representing the linked field trials in London, Lyon, Amsterdam, Munich and Dublin). The "SOCRATES Kernel" project provides a centre of excellence and expertise in which SOCRATES problems can be discussed, and the technical and commercial developments in the three SOCRATES pilots are coordinated.

The projects have the involvement of some of the major European communication companies

along with large European car manufacturers. The SOCRATES Kernel involves 14 separate companies, of which four are based in the UK, including such famous names as British Telecom, Philips, BOSCH, Volvo, SAAB, Daimler Benz, and the Ford Motor Company.

Ian Catling Consultancy are independent coordinators for the projects and ultimately the project managers.

Preparation and Submission of the project

ICC had already established many links in the field of Route Guidance Systems and indeed took part in the formation of the original DRIVE programme. This certainly benefitted the development of the original SOCRATES project alongside the emerging DRIVE Programme. Links with potential project participants were established and the concept created well before the call for proposals, to avoid a late minute rush which could ultimately reduce their chances of success.

In preparing a project proposal, ICC looked at the structure and objectives of what was proposed and allocated responsibilities for specific areas of the project to the various participants. This ensured a good cover for the different aspects of the proposal and reduced the burden on the prime proposer. With 14 participants SOCRATES is a substantial DRIVE project and naturally the management of such a large project takes on a new dimension. Having allocated responsibilities according to 20 Workpackages that were identified, certain participants formed small groups with one of them in the lead and ICC in overall charge.

Independent Assessment

ICC felt that it had been somewhat easier to negotiate a successful contract in DRIVE 1 than in its successor DRIVE 2 when the number of organisations applying led the Commission to offer reduced funding across the board.

Contract Negotiation

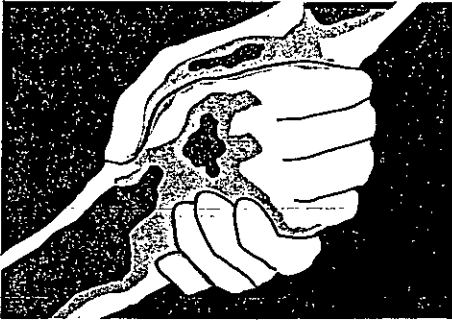
In both DRIVE 1 and 2 the call closed in September and the research was underway by the following January. Although the Commission had not formally signed the contract by then, it had given an undertaking to do so.

Project execution

In collaborating, the overheads have been reduced and the European funding has been a spur to collaboration. The collaboration has meant regular coordination meetings and then inevitably administrative costs in managing a multinational. Overall ICC rated the programme as very good and were pleased to be involved.

Exploitation

The project will lead to the setting of a European Standard. Pilots covering Europe are already taking place and these will ultimately lead to a comprehensive European system. Links are also being developed with the American "Intelligent Vehicle Highway System" programme.



Case Study: BRITE/EURAM British Cement Association

The Company

The British Cement Association represents the interests of the British Cement Industry, such large names as Blue Circle, Rugby and Castle. BCA has applied for and been successful in three European Community Research and Development Programmes. BCA is currently involved in a BRITE/EURAM project on the 'Residual Service Life of Concrete Structures'.

The Programme

The principal objective of the BRITE/EURAM programme is to contribute to the rejuvenation of European Manufacturing industry and a reduction in the environmental impact of the manufacturing of material goods. This is to be achieved through advancing the technologies required to address the whole life cycle of materials with the aim of reducing the design to product lead time and improving the manufacturing process.

The Project

A very high proportion (over 40% in the UK) of national construction expenditure is spent on repairs to and maintenance of mature structures. The project aims to develop a system which will enable the current state and future performance of a structure to be established quantitatively. Three deterioration mechanisms are being considered: corrosion of reinforcement, freeze-thaw damage and alkali-silica reaction. For each mechanism, methods will be developed to establish the aggressiveness of the environment, the current state of materials within the structure and the current rate of deterioration, and the influence of this on structural performance. This information will permit rational decisions to be made for a maintenance and repair strategy.

Preparation and Submission of the project

The project started in March 1992 and is expected to run until February 1995. The British Cement Association is collaborating with five other organisations who are world leaders in the field of construction materials. Having worked with many of the group before, most of the work required to establish a truly European collaboration had already been done before the Call for Proposals was issued. The BCA stressed the importance of preparing well for the project.

They felt that many people were good at defining the problem but were less adept at system analysis and 'who's going to do what'. BCA broke down the project to a list of key activities and assigned people to be responsible for each. By using a matrix each partner could clearly see what they were responsible for and the payment structure and timescale to be followed.

Independent Assessment

BCA have found the Commission generally very good in processing the application, giving advice and making the payments. At all stages in the project the BCA have tried to keep the Commission involved from the first meeting of the prospective participants through to the half-way report stage.

Contract Negotiation

In addition to the formal contract from the Commission, BCA drew up a partners agreement to cover such issues as IPR and payments. This was particularly important as the collaborating group included three Swedish partners, who, as organisations from a non-Member State are not allowed to receive any direct financial benefit from participating in EC R&D and in fact have to cover all their own costs (supported by the Swedish Government). This can be an advantage to the collaborating group as it receives the benefit of additional expertise and facilities at no extra cost.

Project execution

BCA said that they felt the project to be of such importance that they would have tried to proceed even without the helpful European funding they have received. The European wide group they have brought together have contributed a great deal in new experimental techniques and expertise, not available in any one single organisation.

Exploitation

BCA found the time required for reporting on the research something of a drawback and felt that the existing exploitation routes for EC R&D were weak. In general terms, little is known about the output from EC projects. However, BCA are keen to ensure that the results of this project are developed into European Standards which are likely to have widespread benefits

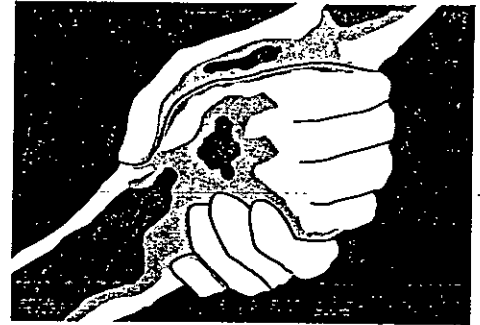
across Europe. This is especially significant at this time when the construction industry is undertaking little new building work.

The benefits for existing buildings and other structures such as bridges and roads will result in the best strategic decisions being taken about the future use of the structure, with or without remedial work.

Overall BCA said that collaboration, networking and joint ventures were the right way forward for this type of research which leads to a common European Standard and they were keen to take part again.

ESPRIT

European Strategic Programme For Research and Development in Information Technology



Introduction

ESPRIT is a shared-cost programme launched by the European Community in February 1984 in response to growing concern at the European information technology (IT) industry's poor competitiveness. It was the result of initiatives taken by the Commission and the so called 'Round Table' of leading European IT Firms - GEC, ICL, Plessey (UK), Bull, CGE, Thomson (France), AEG, Nixdorf, Siemens (Germany), Olivetti and Stet (Italy) and Philips (Netherlands).

The programme is designed to help provide the European IT industry with the key components of technology it needs to be competitive in world markets. It aims to foster collaboration and pave the way to standards of European origin, while boosting pre-competitive R&D in the key areas of information technology. Following ESPRIT I (1984-88) and ESPRIT II (1988-92), ESPRIT III was launched in July 1992, and work on projects began late in 1992.

Technical Coverage

1. Microelectronics - The goal of the work in this area is to strengthen the European IC users' capabilities to develop advanced and innovative electronic systems for a broad range of applications, by providing them with a competitive European source of the necessary technologies and tools. The work on the development of CMOS technologies and relevant design, manufacturing and packaging techniques is carried out in conjunction with JESSI (Joint European Submicron Silicon). Specific actions are run for SMEs, to establish favourable conditions for their use of microelectronics. This covers training, and demonstration of IC capabilities and services.

2. Design and Engineering Technology for Software Intensive Systems - The object is to enhance the competitive advantage in IT user and vendor organisations through improvements in the ability to develop and exploit advanced software intensive systems. Three major lines of R&D action are being followed:

- leading edge applications that illustrate the relevance of the key underlying technologies and provide a focus for their further development;

- new methods, techniques and supporting technology to enlarge the effective use of software intensive IT systems and to improve the process of their design, engineering and management;

- key technology components with a specific emphasis on improving the ability to build and use information management systems in an open, distributed and heterogeneous environment.

3. High Performance and its Applications -

The work in this domain aims to promote the application of High Performance Computing and Networking (HPCN), and to demonstrate the cost-effective transfer of applications currently running on conventional systems to HPCN environments. It also supports new applications to gain experience in the use of new functionalities and levels of performance. The development of the next generation HPCN technologies and systems is also pursued.

4. Advanced Business and Home Systems; Peripherals -

Work in this area promotes the development of open integrated solutions focused on specific applications, and the use and vertical integration of multimedia and related display and memory technologies. Applications lie in three distinct, but inter-related fields: professional applications, business applications and personal high volume electronics applications.

5. Computer Intergrated Manufacturing and Engineering -

This work contributes to the improvement of the competitive position of the European manufacturing and engineering industries by encouraging the development of advanced IT solutions for cleaner and highly efficient industrial operations and processes. It supports an integrative approach embracing engineering, logistics and operations, process automation and business functions, in a way which takes account of social, organisational economic and environmental concerns.

6. Basic Research - The intention here is to enhance the potential for future technological breakthroughs in information technologies, to contribute to the programme's main objectives from an upstream position and to reinforce inter-disciplinary links. Apart from projects in this area, there will be additional activities such as working groups which will help produce added value to research through cooperation at European level.

7. Open Microprocessor Systems Initiative -

This aims to provide a complete European microprocessor systems capability, building on existing strengths and exploiting the latest advances in microelectronics and software technology. The initiative is driven by the needs of the systems user to integrate single chip

solutions using an open macrocell library approach. Open systems software and tools will allow the systems integrators to easily customise applications, providing an upgrade path from existing solutions.

Funding and Timescale

Funding for ESPRIT I (1984-88) and ESPRIT II (1988-92) has been fully committed. ESPRIT III will provide over £1 billion of support, and is scheduled to run between 1990 and 1994. However the majority of the money will be allocated by autumn 1993 following the second call for proposals which is taking place early in that year. ESPRIT will receive a top-up of 180 MECU in early 1993.

Participation

ESPRIT is open to companies, academic institutions and research bodies irrespective of size or whether they are public or private. The basic level of Community support is 50% of all allowable costs, although universities and research institutions can opt for 100% of additional expenditure as an alternative. As a rule, each project must include industrial companies from at least two Member States.

Management of the Programme

Management of ESPRIT is a co-operative effort between the Commission, which undertakes all day-to-day organisational tasks, representatives from Industry (for example, the ESPRIT Advisory Board) and a Management Committee (consisting of Government representatives from Member States).

The programme is organised on a regular cycle. Submissions are invited through calls for proposals which are published in the Official Journal of the European Communities and advertised by the DTI through the ESPRIT Unit. These calls are based on a Work programme published in advance which sets out the detailed project requirements. The notice period for calls is relatively short, about three months from official notification. This is not a long time to put together a collaborative project of the quality necessary to succeed in what is a very competitive process. The DTI can help find partners for such projects and is able to provide other advice as necessary on the nature of the applications.

Status Report

So far under ESPRIT III almost 300 projects have been approved and work on these began late in 1992.

Future Plans

The two calls of ESPRIT III will account for the majority of the funds available. However it is expected that the Commission will use around £15 million to launch a technology transfer initiative in the field of software engineering. That is called ESSI (the Europe Systems and Software Initiative) and is likely to commence in the spring of 1993.

Contacts

UK

For general enquiries about ESPRIT please contact DTI's ESPRIT UNIT:

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For enquiries from Universities or Academic Organisations please contact:

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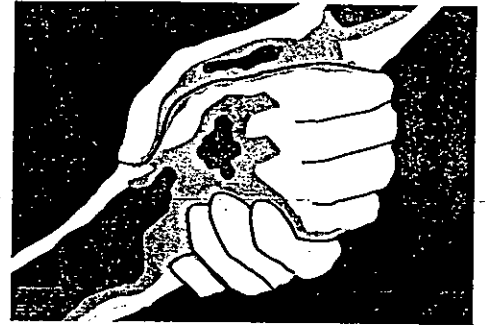
Commission

Commission of the European Communities
DGXIII - Telecommunications, Information
Industries and Innovation
ESPRIT Information Desk
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RACE

Research and Development in Advanced Communications Technologies in Europe



Introduction

The RACE Programme began in July 1985 by a decision of the Council of Ministers to proceed with a 'Definition Phase' for a Community action in the field of telecommunications technologies. This led to the adoption of RACE I (Main Phase) by the Council of Ministers in December 1987. A further programme in the field of Communication Technologies, RACE II, under the 3rd Framework (1990-1994) has been adopted at the 7 June 1991 Council meeting.

The aim of RACE is to establish a strong Community manufacturing industry in broadband communications and to accelerate the emergence of a competitive Community market for telecommunications equipment and services, at the same time working towards uniform standards throughout Europe.

RACE I developed Integrated Broadband Communications (IBC) demonstration equipment, standards and created a technological base for advanced IBC equipment and services.

RACE II will build upon the work of RACE I and will focus on 8 priority areas including IBC R & D; Intelligence in networks/flexible communications resource management; Mobile and personal communications; Image and data communications; Integrated services technologies; Information security technologies; Advanced communications experiments and Test infrastructures and interworking (a horizontal R & D area supporting the other priority areas).

Technical Coverage

The work to be carried out will be structured into three main parts as shown below.

Part 1 : Development and Implementation Strategies for IBC Systems, Services and applications concerns, IBC systems design, architecture and operation; implementation and transition strategies; common operational environment; service infrastructure engineering/modular standardisation; generic applications strategies; service quality, security and reliability engineering.

Part 2 : Advanced Communication Technologies includes intelligence in networks/flexible communications resource management; mobile and personal communications; image and data communications; techniques for basic IBC system functions; integrated service technologies; techniques for advanced communications experiments; information security technologies.

Part 3 : Validation of Standards and Common Functional Specification for IBC includes: integration of IBC demonstrators; service technology verification; applications experiments; test infrastructure and interworking; verification tools.

The 8 work areas in RACE II and the money to be spent on them (in MECU) are listed below. This breakdown does not exclude the possibility that projects could come in several areas. There are also funds for EC staff and administration in the programme.

1 IBC (Integrated Broadband Communications)	111
2 Intelligence in networks/Flexible communications resource management	43
3 Mobile and personal communications	53
4 Image and data communications	68
5 Integrated services technologies	39
6 Information security technologies	29
7 Advanced communications experiments	121
8 Test infrastructures and interworking (horizontal R & D area supporting the other priority areas)	20

Funding and Timescale

The overall size of the RACE II programme is 489 MECU. There was an initial Call for proposals on the 12 June 1991 which closed on the 16 September 1991. The Call was briefly re-opened until the 10 February 1992 to enable a more complete coverage of the tasks. The end of RACE I overlapped with the start of RACE II. RACE II ends in 1994. Future Communications Research programmes are under discussion.

RACE will receive a top-up of 65 MECU in early 1993, which may give rise to a call in 1993.

Participation

Work under the RACE II Programme is carried out by collaboration between industry, academic institutions and telecommunications operators. The Community may contribute up to 50% of the project funds.

Management of the Programme

Management of the programme is ultimately the responsibility of the European Commission (DG XIII) which undertakes the day-to-day organisation of the Programme. In addition, the RACE Management Committee (RMC), consisting of Government representatives of Member States, acts as an independent advisory body and approves the Commission's proposals on such issues as the Programme's Annual Work Plan, evaluation, the participation of third countries, departures from the Programme's general provisions and major contracts.

Contractors working in the RACE programme are required to attend periodic progress meetings, termed "Concertation" meetings, where mutually dependent deliverables and milestones are examined. There is therefore a continuous self audit by contractors. Each project is audited annually by independent technical auditors.

Status Report

In the two calls for RACE I some 90 contracts have been let with the UK being involved in 76. Projects are audited annually with termination or extension of project time depending on success of project. UK companies have received 23% of RACE I funds, and have had the highest success rate in Europe (30%) of converting proposals to contracts. (All RACE I projects will end by 1992.) Under RACE II, UK organisations are involved in 75% of the projects so far. The enthusiasm of UK organisations, often small in size, to work with European partners has been especially encouraging.

Future Plans

A new Communications Research Programme is not expected until Framework IV funds are available (which will probably be after 1994). Its shape and size is not yet known.

If you are interested in participating, you should ensure that the European Commission is aware of your interest; write directly to Brussels (see 'Contacts').

All documents relating to the RACE programme, such as the workplan, should be obtained directly from the Commission.

Contacts

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2/131 Red Zone
151 Buckingham Palace Road

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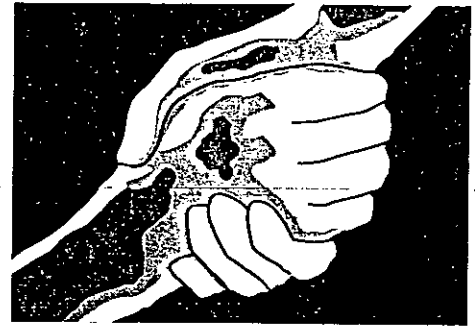
Commission

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Fax: 010-322 295 0654

The Telematics Programme

GENERAL

AREA 1 Support for the Establishment of Trans-European Networks between Public Administrations
AREA 2 Transport Services (DRIVE)



General

The third Framework Programme for European Collaborative R&D includes provision for some £270 million of Community aid for "the development of telematic systems in areas of general interest".

These funds will be available during the period up to the end of 1994 for research and development projects which will stimulate the development of a trans European electronic information exchange infrastructure.

The telematics programme is in some ways a different kind of R&D programme from others coming from the EC. Like others it is industry led, requires projects to be collaborative, with partners taken from more than one member state, and is precompetitive. However, activities are concentrating on the use of new technologies wherever possible, and on the needs of the users of electronic information and their need for interoperability throughout the EC.

With the completion of the Single European Market in 1992 the necessity to transfer information throughout the Community will increase as a result of the deregulatory legislation leading to free flow of persons and goods. The Telematics programme is looking ahead to electronic information storage, exchange and interpretation in the Europe of 1993 and beyond. Issues being addressed in the current projects are centred on the development of standards profiles, security controls and messaging protocols, as well as the identification of regulatory obstacles to implementation. The UK is involved in some 100 of the 140 or so projects where funds have been committed.

The telematics programme comprises 7 work areas, but with an emphasis on coordination and transfer of results across the programme. The results of the former DRIVE, AIM, DELTA and EUROTRA programmes will be used and built on within their respective areas within the telematics programme.

Calls for Proposals for all Areas were issued in 1991. The telematics programme will receive a top-up of 51 MECU in 1993. In some Areas further, limited, calls are planned for 1993.

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AREA 1 Support for the Establishment of Trans- European Networks between Public Administrations

Introduction

In order for public administrations throughout the European Community to implement successfully the Single European Market, and its 'four freedoms' of movement (goods, persons, services and capital), it will be necessary for national administrations to function as if they covered the whole Community.

This 'virtual European Administration' will be partially built on the exchange of information electronically between national administrations in different Member States. There is a growing need for IT/telecommunications networks which will be able to interoperate across the Community.

Technical Coverage

Rather than looking for new technology, the work is applying existing technology. All work will be 'user-driven' and concentrate on the need for exchange of information between Member States within a particular application sector. Projects comprise a definition phase to model the user requirement, an engineering phase, and a verification phase where results will be tested on data within that sector. Each project involves representatives of the relevant parts of Member States' administrations to ensure that the end users' needs are being adequately addressed.

Emphasis is on the development of standards, functional specifications and architectures

common both across the Community and across many application sectors and which contribute to a broader and more relevant platform for interoperable systems. It is important to note that application sectors were not specified in the work programme. These were determined by those specified in successful proposals.

Funding and Timescale

Area 1 was allocated 41.3 MECU out of the 380 MECU allocated to the Telematics programme.

A Call for Proposals was published on 15 June 1991. Following evaluation and negotiation of proposals, 13 contracts were awarded at the end of 1991 or early 1992, fully committing the current budget.

Participation

Projects involve the participation of at least two independent partners in the Community not all from the same Member State.

Management of the Programme

The programme is managed by a team of officials within the European Commission, operating under the control of the telematics management committee composed of representatives of Member States.

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AREA 2 DRIVE Transport Services

Introduction

Under the third Framework Programme DRIVE II (Dedicated Road Infrastructure for Vehicle Safety in Europe) continues under the heading of Telematics Area 2, Transport Services.

The activities will contribute to the development of integrated trans-european transport services using advanced IT and telecommunications (Telematics) to improve the safety and efficiency of passenger and freight transport services, and reduce the impact of transport on the environment.

The work includes inter-modal links between road, rail and sea transport.

DRIVE II is particularly concerned with the needs of users and responsible for safety and the provision and maintenance of infrastructure and of transport services.

Technical Coverage

The activities are divided into three interactive parts: the definition of functional specifications in the context of a strategy for the use of technology and telematic systems for communication and traffic control, the development of new technologies and experimental systems, and validation work through pilot projects.

1. Strategies for the use of technologies, telematic services and systems and contribution to the definition of common functional specifications: The results of the work carried out so far under DRIVE and relevant EUREKA projects have enabled the needs specific to road transport and the technologies and systems available for communications and traffic control to be identified and evaluated. On the basis of these results, strategies for using the technologies and systems will be sought in co-operation with the transport users, businesses, providers of transport-related services and the administrations concerned. Systems engineering work continues on an integrated transport environment, addressing the development and implementation strategies. It will contribute to the development of common functional specifications in terms of equipment, services and operational procedures, and to make recommendations to standard setting authorities such as CEN/CENELEC and ETSI for traffic control, freight transport management, driver support and road safety.

2. Technologies and experimental development of systems: The work takes account of the technologies emerging from the information and communications initiatives, the results of research carried out under DRIVE and in other activities both in the Community and Member States.

Technologies and experimental systems for managing transport and controlling road traffic will be developed and evaluated for both passenger and freight transport.

Safety and communication systems concentrate on helping drivers on long journeys. The research takes into account man machine interactions so that on-board systems and equipment will not reduce safety and to ensure their effectiveness in communications with fixed infrastructure equipment.

Research and technological development work specific to freight transport, including dangerous goods transport, is included. It covers the software, hardware and communication links necessary to assist freight traffic management. This work concerns real-time monitoring of the various transactions, the freight itself and the vehicles; tracking and management systems for all kinds of vehicle fleets will also be developed.

In the public transport area, work on monitoring and control continues to evaluate the cost-effectiveness of systems for on-line monitoring, scheduling and control for users and providers of services and to establish the necessary functional specifications.

The technological solutions will have to ensure that the telecommunications equipment to be applied matches, in terms of size, cost and performance, the intended applications and markets identified.

Special attention will be given to existing and emerging systems linked with satellite and digital cellular communication networks. Of particular importance is the assessment of the systems able to provide incident detection and provide usable information to network managers and road users using road-vehicle communication links.

3. In order for the new systems and devices to be accepted by both the general public and the relevant authorities, they must be of proven performance and reliability and their potential impact on the environment must be assessed. This requires full-scale pilot projects to establish whether technologies serve user needs, contribute significant gains in efficiency (with existing and new infrastructure), safety and environmental benefits, are cost effective and provide satisfactory system security and interoperability. These are oriented towards the integration of multiple subsystems, functions and services which require strong pre-standardization efforts. The sector actors are all closely associated with the work if not directly involved.

These experiments cover areas including integrated urban traffic management; monitoring of air pollution; integrated motorway traffic management; vehicle-roadside communications; driver information; transport demand management; public transport; freight transport and trip planning.

The potential for rigorous evaluation was a prime requirement in selecting and designing the pilot projects. Projects will also evaluate technologies and systems covering a wide range of applications.

Management of the Programme

The European Commission, DG XIII C4 are responsible for the management of the programme.

Funding and Timescale

Area 2 of the Telematics programme has been allocated 124.4 MECU out of a total budget of 380 MECU.

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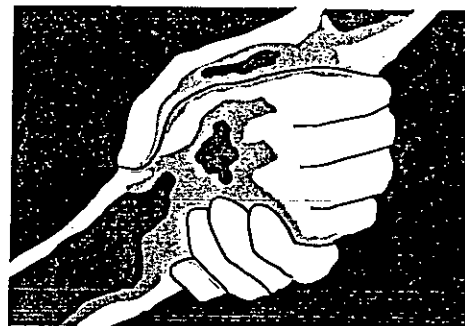
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The Telematics Programme

AREA 3 Health Care

AREA 4 Flexible and Distance Learning (DELTA)



AREA 3 Health Care

Introduction

The healthcare section of the telematics programme is usually referred to as AIM (Advanced Informatics in Medicine), a research and development programme with the objective of applying information and communication technologies to health care. It aims to increase harmony and cohesion in this area across Europe, to improve the quality and cost-effectiveness of medicine and also to strengthen the competitiveness of European telematics industry by stimulating the demand for new services.

During an initial exploratory phase during 1989 and 1990, 42 projects were funded from 20 million ECU budget (about £14 million). This was a precompetitive, shared cost programme and was completed December 1990.

It was always intended that, provided the Exploratory Phase was judged to be successful, there would be an AIM Main Phase and this was approved as part of the telematics line within Framework III.

Technical Coverage

The new programme, whilst building on the work of the Exploratory Phase, sets out to develop tools, techniques and practises supporting a common European approach to Health care Informatics and Telecommunications and to guarantee their acceptance by promoting close collaboration between all involved - academics, industry and the whole spectrum of health care users. This involves work in three main directions: definition of strategies, research and development, and validation and integration.

The main task areas being addressed are:

1. Strategies for the use of telematics technologies, systems and services, with contributions to the definition of common functional specifications:

(a) Identification of user needs, regulatory tools, incentives and criteria for the appropriate use of technology in health care;

(b) Harmonisation of medical and health care management data and technology, common functional specifications, standards and communications protocols.

2. Development of telematics technology applied to medicine:

- (a) Alphanumeric data and coding standards
- (b) Images and biosignals
- (c) Integrated instrumentation and devices
- (d) Knowledge based and decision support systems
- (e) Medical use of multimedia workstations
- (f) Health care communication systems
- (g) Telecommunication systems for medicine
- (h) Modularity and integration of medical information and archiving systems
- (i) Technologies and services for the handicapped and elderly

3. Validation and integration

(a) Pilots for integrating medical equipment and information systems: these include:

Computer-aided therapeutic systems;
Architecture in an Integrated Biomedical Laboratory;
Use of mobile telematics in emergency health care;
Telematic and Information Systems in a departmental environment;
Development of a pilot for a decentralised hospital information system;
Development of a pilot for the use of machine-readable cards;
Development of medical software engineering techniques and tools.

(b) Validation applications.

Funding and Timescale

As part of the telematics line of Framework III the health care programme was allocated a budget of 97 MECU over the period 1991-1994. This has recently been "topped up" with around 11 MECU, which is likely to be used to enhance the existing programme. The Call for Proposals was published in June 1991 and proposals were delivered to the Commission by 16 September 1991.

Participation

The programme operates normally on a shared-cost basis, with the Commission contributing up to 50% of the project costs, but there is provision for 100% funding of marginal costs in some cases.

193 project proposals were received by the date, and following evaluation and negotiation, 37 projects were awarded contracts; work began in January 1992. Work is now in progress on 36 projects.

Projects are for up to three years, but there is an annual audit and review. The programme also provides for some supporting measures (Accompanying Measures and Concerted Actions) and work is being carried out in the areas of Nursing, Primary Care, Medical Records, Teaching and Learning, and Casemix Resource Management; there is likely to be some other work.

Management of the Programme

Programme management is carried out by a dedicated team within the Commission, operating under the general control of the Telematics Management Committee, composed of representatives and experts from each member state.

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Area 4. DELTA

DELTA [Developing European Learning through Technological Advance] was a 2 year Exploratory Action adopted in June 1988, which formed part of the Research and Development Framework Programme (1987-1991). DELTA sought to examine expected technological advances and harness these to European learning needs, and also to provide tools to help trainers throughout Europe understand and use new technologies.

The areas of research were: learning systems research; development of advanced learning technology; testing and validation; compatibility between different learning systems and research into obstacles to the take-up of new learning methods.

Research was carried out by collaborative projects. Each project had to include an industrial partner, a learning interest and representation from more than one Member State. The projects proceeded on a shared-cost basis and the research was at the pre-competitive and pre-normative level.

A new phase of DELTA, DELTA 91 follows on from the Exploratory Action, within the Telematics programme.

Following technical evaluation in October 91 and consideration by the Telematics Management committee, 22 projects were selected for the DELTA programme. Five out of the 22 successful proposals are UK led, with the UK being involved in all but five of the projects.

The Commission have now announced funding for a series of Concerted Actions which aim to relate national initiatives to DELTA projects. Funding is available to cover travel to and attendance at various workshops and meetings.

Technical Coverage

The programme focuses on the needs of the users of electronic distance learning services and their need for interoperability throughout the EC. Activities concentrate on harmonising and adapting the existing technologies and on testing the performance of the various possible distance learning systems and technologies. The work is carried out in three independent areas of research:

I Implementation Strategies and Scenarios: concerned with the use of technologies and telematic systems including the definition of common functional specifications for the optimal implementation of distance learning services.

II Technology and Systems Development: concerned with refining the technology to achieve the appropriate telematic facilities for distance learning services.

III Pilot Testing and Validation: concerned with setting-up experiments to integrate facilities to serve real needs so that the performance of different technological configurations can be assessed and evaluated.

Contracts were awarded by open tendering procedure, by means of the call for proposals published in the Official Journal of the European Communities.

Organisations eligible to participate in the flexible and distance learning line of the new Telematics programme include: telecommunications network operators, research establishments, universities, and production and services undertakings, including small and medium sized enterprises.

Projects involve the participation of at least two independent partners in the Community not all from the same Member State. Within each project at least one partner is an industrial undertaking and another partner has education and training interests.

Links with other EC programmes such as COMETT, RACE, ESPRIT etc. are important.

Funding

The Telematics programme has an overall budget of 380 MECU for the period 1990-1994, of which 54.5 MECU (approx £38m) is allocated to the flexible and distance learning area of the programme.

Timescale

The Commission has not announced whether a further call for proposals will be issued in the future.

Management of the Programme

Management of the programme is the responsibility of the European Commission, assisted by a committee composed of two representatives from each Member State.

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The Telematics Programme

- AREA 5 The Libraries Programme
 AREA 6 Linguistic Research and Engineering
 AREA 7 Telematic Systems for Rural Areas



AREA 5 Libraries

Introduction

In 1985, the European Council of Ministers passed a resolution to support the development of library systems and services in the European Community. This resolution led to various meetings and discussion papers, the main one being the "Plan of Action for Libraries in the EC" which was published in draft form in the summer of 1988 and revised in February 1989. This Plan was distributed widely throughout the 12 Member States. It was welcomed by the Community as the first proposed action at Community level dedicated to library co-operation.

The library scene is not homogeneous. Preliminary studies have demonstrated that the development of libraries and of library automation in the different member states is uneven and different types of libraries have differing objectives, priorities and user populations.

Initial Community activity in the libraries area cannot attempt to resolve all the long term issues. It can only serve to initiate a process which will ultimately modernise library services to users. The Programme will therefore be selective, concentrating on urgent problems which can catalyse change in a concrete and practical way.

Several test-bed pilot projects were supported (through the IMPACT programme) to set the scene for the Libraries programme. The principal projects were to develop compatible CD-ROM products containing national bibliographies for seven European national libraries, and to investigate and implement the Open Systems Interconnection protocol for interlinking between France, the Netherlands and the UK. Various smaller projects were also supported.

Technical coverage

The Plan of Action sets four principle objectives. It is designed to: promote the availability and accessibility of modern library services throughout the Community; introduce new information technologies into libraries in a cost-effective way; encourage standardisation; and lead towards the harmonisation and convergence of national policies. The Plan is structured into four

action lines within the context of which a range of individual shared-cost co-operative European projects can be launched in conjunction with national and regional policies for libraries. The action lines are structured as follows:-

Action Line I Computerised bibliographies: to create, enhance and harmonise machine readable bibliographies and union catalogues and to develop the necessary tools and methods for the retrospective conversion of catalogues of internationally important collections.

Action Line II International linking of systems: to provide a coordinated incentive to test and apply new telecommunication services, analyze their cost-effectiveness and ensure compatibility through appropriate standards so that libraries will be able to set up networked services.

Action Line III Provision of new library services that will enable libraries to satisfy user needs more efficiently and effectively through the exploitation of existing resources in libraries.

Action Line IV Stimulation of a European market in telematic products and services specific to libraries: to encourage the private sector to investigate the library market and to implement new products which will have cost benefits for the library community.

Funding and Timescale

The Libraries Programme falls within the Telematics Chapter of the third Community Framework Programme which has a total budget of 380 MECU. Approximately 22.5 MECU will be allocated to libraries over a four-year period, from 1992-1996.

Participation

There will be two funding mechanisms - up to 50% support of total costs and up to 100% support of marginal costs. Contracts will be modelled on existing contracts for ESPRIT projects. A checklist for the negotiation and drafting of agreements prepared for the EUREKA programme, is also relevant to the Libraries Programme.

Management of the Programme

Management of the programme is the responsibility of the European Commission, assisted by a committee composed of two representatives from each Member State.

Contacts

At the Commission's request, each Member State has set up a national focal point to ensure that each country participates effectively in the Programme. In the UK, the Advisory Committee on the European Library Plan (ACELP) was set up in 1990; membership is by personal invitation from the Secretary of State for National Heritage. Further information on the Libraries Programme may be obtained from:-

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AREA 6 Linguistic Research and Engineering

Introduction

The aim of this area is to develop a basic linguistic technology which can be incorporated into a large number of computer applications where natural language is an essential ingredient, with a view to accommodating or overcoming limitations and inefficiencies within the Community brought about by different natural languages.

Technical coverage

The area is divided into three parts.

1 Research aimed at the improvement of the scientific basis of linguistic technologies.

The themes open for proposals are: Improvement of the interlinguality of the linguistic representation of text/discourse; Use of domain-specific knowledge to constrain linguistic interpretation of text/discourse; Interfacing with speech technology; Use of advanced computational technologies; Economic and social impact of new linguistic technologies.

2 Creation of common methods, tools and linguistic resources.

The themes open for proposals are: Software tools; Grammars for the Community languages, general dictionaries (mono- and multilingual) covering the Community languages; Terminology collections; Textual and phonetic corpora and pre-normative research for linguistic tools and resources.

3 Applications based on the common linguistic tools and resources.

The themes open for proposals are: Multi-lingual machine translation (EUOTRA); Multi-lingual abstracting and indexing; Aids for mono- and multi-lingual document generation; Integration with speech analysis and synthesis; Multi-lingual interfaced to information systems; Content analysis for building knowledge bases from natural language text; and Computer aided instruction especially in the context of language teaching.

Pilot applications and demonstrations projects will help to test the progress of research work and to demonstrate the technical and economic feasibility of tool, methods and resources in an operational environment.

Funding and Timetable

Linguistics has been allocated 22.5 MECU. The first call has taken 7 MECU and a second call is expected in early October 1993.

Management of the Programme

Management of the Linguistics programme is the responsibility of the European Commission.

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AREA 7 Telematic Systems for Rural Areas

Introduction

As part of the 'Programme of Research and Technology Development in the field of Telematic Systems of General Interest' the European Commission is undertaking a programme of research on telematic systems for rural areas.

Technical coverage

The goal is to create the conditions for geographically dispersed small businesses to provide more diverse employment opportunities and a more balanced economic activity in rural areas; establish a basis for provision of improved services to dispersed and isolated populations; raise the level of awareness of the potential of information and communication technologies in rural areas; encourage manufacturers and service providers to make equipment and services easier to use by rural communities; and ensure that the applications of telematic systems in rural areas do not contribute to further centralisation of business and administrative activities and a loss of the cultural and economic diversity of rural areas in Europe.

In order to achieve these objectives, the actions are structured as follows:

Part I : Co-ordination and consensus development with industry and rural development agencies;

Part II : Identification of needs and opportunities for telematic services;

Part III : Specification of service and technology requirements.

16 Projects let so far, in the context of rural areas, which relate to: delivery of information and organisation, market implementation and psychological aspects of teleworking,

technology strategy for the provision of infrastructure to support advanced telematic services, telematics applications for tourism and leisure, topological mapping of mediterranean rural areas, distributed inter-regional agri-tourism multimedia management systems, telematic systems database and management, services and applications for rural business activities, professional and financial services, analysis of on-going development projects involving telematic systems use, evaluation of telematics applications.

Funding and Timescale

Approximately 14 MECU was allocated to the rural programme to cover the period up to the end of 1994. A Call for proposal was made on the 15 June 1991 and closed on 16 September 1991. The Call was reopened until the 30 April 1992 so that tasks could be more adequately addressed.

Management of the Programme

Management of the programme is the responsibility of the European Commission assisted by a Management Committee of Member States' representatives, chaired by a representative of the Commission.

Status Report

Work is progressing towards the programme objectives in the 16 projects under contract. UK organisations lead 5 out of the 13 projects in which they participate.

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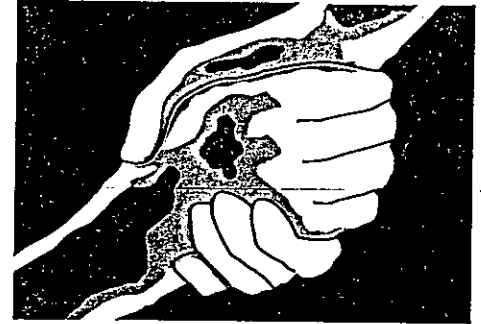
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IMT

Industrial and Materials

Technologies Programme

(1991-1994) (Brite/Euram II)



Introduction

The Industrial and Materials Technologies programme continues the work of BRITE/EURAM and part of the Raw Materials and Recycling programme under the third Framework Programme.

The principal objective of this four year programme is to contribute to the rejuvenation of European manufacturing industry by strengthening its scientific and technological base through research and development activities. This objective will be realised through advancing the technologies required to address the whole life cycle of materials with the aim of reducing the design-to-product lead time and improving the manufacturing process. The activities pursued in the programme will lead to the general development of the Community towards economic and social cohesion, and a reduction in the environmental impact of the manufacturing of material goods.

Technical Coverage

The programme is divided into three technical areas.

AREA 1: MATERIALS - RAW MATERIALS

1.1 Raw Materials

- 1.1.1 Exploration Technology;
- 1.1.2 Mining Technology;
- 1.1.3 Mineral Processing.

1.2 Recycling

- 1.2.1 Recycling and Recovery of Non-Ferrous Metals;
- 1.2.2 Recycling, Recovery and Reuse of Advanced Materials.

New and Improved Materials and their Processing

1.3 Structural Materials

- 1.3.1 Metals and Metal Matrix Composites;
- 1.3.2 Ceramics, Ceramic Matrix Composites and Advanced Glasses;
- 1.3.3 Polymers and Polymer Matrix Composites.

1.4 Functional Materials for Magnetic, Superconducting, Optical, Electrical and Biomaterial Applications

- 1.4.1 Magnetic Materials;
- 1.4.2 High Temperature Superconducting Materials;
- 1.4.3 Electrical and Ionic Conducting Materials;
- 1.4.4 Optical Materials;
- 1.4.5 Biomaterials.

1.5 Mass Commodity Materials

- 1.5.1 Packaging Materials;
- 1.5.2 New Construction Industry Materials.

AREA 2: DESIGN AND MANUFACTURING

2.1 Design of Products and Processes

- 2.1.1 Innovative Design Tools and Techniques;
- 2.1.2 Design Methodologies for Complex Components;
- 2.1.3 Design for Reliability.

2.2 Manufacturing

- 2.2.1 Tools, Techniques and Systems for High Quality Manufacturing;
- 2.2.2 Manufacturing Techniques for Industrial Use of Advanced Materials;
- 2.2.3 Integrated Approach to Chemical Engineering.

2.3 Engineering and Management Strategies for the Whole Product Life Cycle

- 2.3.1 Design Integrating Strategies;
- 2.3.2 Engineering;
- 2.3.3 Human Factors in Engineering and Manufacturing Management.

AREA 3: AERONAUTICS RESEARCH

3. Activity in Aeronautical Technology

- 3.1 Environment Related Technologies;
- 3.2 Technologies of Aircraft Operation;
- 3.3 Aerodynamics and Aerothermodynamics;
- 3.4 Aeronautical Structures and Manufacturing Technologies;
- 3.5 Avionic System Technologies;
- 3.6 Mechanical, Utility and Actuation Technologies.

Funding and Timescale

The programme was launched in December 1991 with a budget of 663 MECU over four years. The indicative allocation of funds is as follows:

Area 1:
Materials/Raw Materials - Raw Materials and Recycling 80 MECU, Materials 228.8 MECU ;

Area 2:
Design and Manufacturing 301.5 MECU;

Area 3:
Aeronautics Research 53MECU.
BRITE/EURAM II will receive a top-up of 99 MECU early in 1993.

Participation

All industrial companies, universities, other HEIs and research organisations are eligible to take part in the programme (except under the Feasibility Awards scheme which is for Small and Medium-sized Enterprises only). The conditions for participation vary according to the different forms of support.

Industrial Applied Research. The principal form of support is through shared-cost action. Each project requires the participation of at least two legally independent industrial enterprises coming from at least two Member States, with the industrial organisations providing at least 50% of their own costs. Universities, Higher Education Institute and similar organisations may receive up to 100% of their additional costs from the Commission. The total size of each project will normally fall in the range 1.0 to 5.0 MECU and involve at least 10 man-years of activity.

Focused Fundamental Research. In some technology areas industrial progress may seem to be hindered by weakness in basic materials science. In such cases a small number of this type of project will be sought. Up to 10% of the budget is available for this type of activity. Transfrontier co-operation is still required but it is not compulsory to include an independent industrial enterprise. However, to ensure that there is an industrial focus, there is a requirement for a degree of industrial endorsement for the proposed research. Non-industrial participants in Focused Fundamental Research projects may receive 100% of their additional expenditure from Community funds. Projects in this category will normally be in the range of 0.4 to 1.0 MECU total cost, and involve at least 10 man-years of activity.

Feasibility Awards for SMEs. This scheme enables Small to Medium-sized Enterprises (those having up to 500 employees) to apply for Community support to establish the feasibility of a device, process or concept as a means of enhancing their status before seeking partners for a proposal under the shared-cost action. The Commission will support up to 75% of the cost (maximum 30,000 ECU) of research lasting up to 9 months. Separate guidance notes for applicants are issued for Feasibility Awards.

Co-operative Research Action for Technology (CRAFT). Co-operative research is primarily aimed at small and medium-sized firms who do not have their own research installations but with a need to solve common

technical problems. Co-operative research enables these SMEs to come together and assign outside organisations (research association, university or firm) to carry out the research on their behalf. Projects in this category will normally be in the range of 0.4 to 1.0 MECU total cost, with a duration of 1-2 years.

Targeted Research. Targeted Research actions may be introduced. These aim to co-ordinate a group of individual research projects whose specific objectives, arising from technical areas 1 and 2, converge in a common goal of general interest. This will require participation in concertation activities.

Concerted Actions. These consist of actions by the Community to co-ordinate individual research actions carried out by Member States. The Community may provide up to 100% of the co-ordination costs (maximum 400,000 ECU), but make no contribution to the research costs.

Specific Training. Three types of specific training actions covered are:

- (i) Research fellowships in the context of selected and ongoing projects, plus subsidies to the host organisation to cover training expenses within the BRITE/EURAM II project;
- (ii) Specific grants to enable existing project consortia to engage temporary research scientists for better promotion of the results of the work;
- (iii) Support for courses and conferences for training of European technologists in specific tasks related to the BRITE/EURAM programme.

Management of the Programme

Management of the programme is the responsibility of the European Commission assisted by a Regulatory Committee which is made up of representatives of the Member States and chaired by a representative of the Commission.

Status Report

The first call for submission of Industrial Research, Focused Fundamental Research and Concerted Actions proposals was announced in December 1991 and closed on 3 April 1992. The second call is expected to be announced in October 1992, with a closing date of 26 February 1993. An open call for submission of Co-operative Research, Feasibility Awards and Specific training Proposals was announced at the same time.

Future Plans

A second call for Industrial Research, Focused Fundamental Research and Concerted Actions proposals is expected in September 1992.

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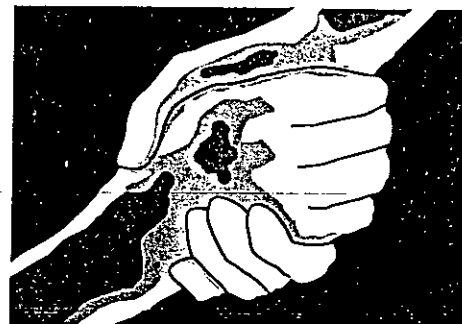
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Measurement and Testing Programme



Introduction

A programme on measurement and testing is running from late 1992 until 1994. This follows on from earlier programmes on the Community Bureau of Reference (BCR) which are now closed to further applications.

The programme aims to improve measurements and analyses carried out in Member States of the European Community in order to eliminate discrepancies which can be the source of disputes and which could hinder the operation of the Single European Market. Implementation of the programme consists of:

- developing collaboration between laboratories of the Member States, for example through inter-comparisons in which the participants collaborate until they agree on their respective results;
- developing means of calibration, such as transfer standards and reference materials, which are necessary for laboratories to verify their performance and to maintain confidence in the results;
- developing new measurement techniques where these are required, particularly for the implementation of Community policies.

Technical Coverage

The technical content of the programme covers a wide variety of topics relating to the measurement of physical quantities (applied metrology) and chemical analysis.

The Measurement and Testing Programme will be directed towards four main objectives:

- support regulations and directives. The work will consist in developing, improving or harmonising the test methods required for the preparation of new regulations and directives concerning agriculture, environment, health and industrial products;
- sectoral problems. The work here will include collaborative projects to solve problems of measurements and testing arising in the course of the preparation of new European standards; collaborative projects to solve measurement problems arising in industry in the application of standards; and the organisation of inter-laboratory comparisons to facilitate mutual recognition

agreements between testing laboratories;

- common means of calibration for the Community. For fields such as food, agriculture, environment and bio-medical analyses, reference materials will be developed in order for laboratories to establish the traceability of their analyses or tests to a common reference. Similarly, transfer standards will be developed for the smaller national metrological laboratories to establish traceability to primary standards held by larger organisations;

- development of new methods of measurement. Work in this area may include techniques for calibration in automated manufacturing systems, methods of measurement in micro-metrology, food control, the chemical form of pollutants, and for certifying reference materials; and research and development into measurement principles which could lead to new instrumentation.

Funding and Timescale

The Measurement and Testing Programme has a budget of about 53 MECU allocated approximately as follows:

- Area 1: Support for Regulations and Directives 13.4 MECU
- Area 2: Sectoral testing problems 12.8 MECU
- Area 3: Support to means of calibration 13.4 MECU
- Area 4: Developments of new methods of measurement 13.4 MECU

Contracts have been placed from late 1992. Measurement and Testing will receive a top-up of 19 MECU in early 1993.

Participation

Industrial firms including Small and Medium-sized Enterprises (SMEs), Universities, Academic Institutions and Research Associations are participating in activities implemented largely by shared-cost actions. The choice of projects is guided by a set of criteria, available on request, which includes consideration on the economic importance of the problem to be addressed, its role in Community trade, and its relation to Community policies. By the nature of the programme, the results are widely disseminated through reports and similar mechanisms. In the

field of analytical chemistry, most projects so far have produced results in the form of certified reference materials which are then sold by the Commission, although the range of activities in this field is now being broadened.

Management of the Programme

Management of the programme is the responsibility of the European Commission assisted by a Programme Management Committee. This is composed of representatives of each Member State and provides advice to the Commission regularly on priorities, the implementation of the programme and the selection of projects.

Status Report

Following discussion of the technical content of the Measurement and Testing Programme between the Commission and Member States and consultation with the European Parliament, it was approved by the Council of Ministers in April 1992.

In July 1992, the Commission issued a call for project proposals in all four Areas of the Programme, with a deadline in September 1992.

The proposals were evaluated by the Commission's panel of independent expert advisers in October-December 1992, and projects for support have been chosen on the basis of this evaluation. Sufficient proposals of quality were identified to commit all the available funds, and it is not currently anticipated that there will be a further call for proposals under the present (1992-94) programme.

A successor Measurement and Testing programme starting in 1995 is anticipated under the Community's fourth Framework Programme. It is expected that details will become available during the second half of 1994.

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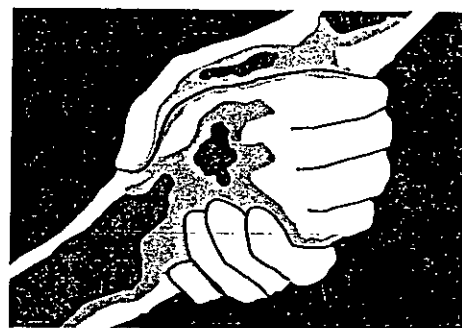
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New EC Environment R & D Programme (1991-94)



Introduction

The specific programme of environmental research 1991-94 (under the Framework Programme 1990-94) provides an extension to and expansion of the two environment-related research programmes "Science and Technology for Environmental Protection" and "European Programme on Climatology and Natural Hazards", under the Framework Programme 1987-91. Under the new Environment Programme, greater emphasis is placed on problems of a global nature and the economic and social aspects of environmental issues are fully addressed for the first time.

Technical Content

The Programme is divided into the four areas set out below:-

Area I. Participation in Global Change Programmes: including climate change (natural, anthropogenic); climate change impacts; global changes in atmospheric chemistry (stratospheric ozone, tropospheric physics and chemistry); biogeochemical cycles; ecosystems dynamics.

Area II. Technologies and Engineering for the Environment: including assessment of environmental quality and monitoring; technologies for protecting and rehabilitating the environment (including re-cycling, with the exception of non-ferrous metals' recycling which is handled within the Industrial and Materials Technologies Programme); major industrial hazards; environmental protection and conservation of Europe's cultural heritage.

Area III. Research on Economic and Social Aspects of Environmental Issues: including the human being, nature and society (perception, knowledge and behaviour; cultural, ethical, religious, philosophical and historical aspects); environmental policy; international aspects.

Area IV. Technological and Natural Risks: including risks from agricultural technologies and land-use practices to soil, surface and groundwater quality; regional aspects of ecosystems protection; environment and human health; risks to health and the environment from chemicals; seismic hazard and volcanic risk; wildfire prevention; desertification.

Funding and Timescale

The total funding for the Programme (which runs from 1991-94) is 414 MECU*. 150 MECU of this is reserved for so-called direct action at the European Commission's Joint Research Centre (JRC), while 261.4 MECU is to be used for so-called indirect action, comprising shared-cost contracts and concerted action (the remaining 2.6 MECU is to be used for the dissemination and exploitation of results).

*Note: Although the official decision is pending, it is likely that a further top-up of 55 MECU will be made available for expenditure under the direct action category within this programme.

The following provides an indicative breakdown of expenditure relating to the indirect action component:-

- Area 1 (Participation in Global change Programmes): 40%
- Area 2 (Technological & Engineering for the Environment): 25%
- Area 3 (Economic and Social Aspects): 6%
- Area 4 (Technological and Natural Risks): 29%

The indirect action component is to be implemented mainly through shared-cost contracts. For these, the EC contribution is up to 50% of total expenditure, although universities/polytechnics and certain other research centres are given the option of 100% funding of additional, marginal costs. Other indirect action includes concerted action, which relates to the co-ordination of research activities carried out in different Member States. Funding for such concerted action is restricted to expenditure on co-ordination (e.g. administration, travel) and it does not cover research expenditure itself.

Participation

Industrial firms, including small and medium-sized enterprises, universities/polytechnics, academic institutions and research organisations are eligible to participate in shared-cost projects. The projects must involve at least two mutually independent partners established in different Member States (organisations in certain non-European Community countries which have S&T agreements with the Community will be able to participate in the Programme).

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Dr A Sors (Others)
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Status Report

The first Call for Proposals was published in July 1991. This covered all areas of the Programme except that dealing with technologies for protecting and rehabilitating the environment. This area was subject to a separate Call for Proposals in April 1992. A second Call for Proposals should be published in early 1993. An information pack relating to this Programme is available from the Commission upon written request to:

Commission of the European Communities,
DG XII-E (ref. Environment Call for Proposals),
Rue Montoyer 75,
B-1040 Brussels,
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Fax: 010-322 296 3024

MAST II Marine Science and Technology

Introduction

MAST II is a direct development of MAST I (1989-1992) which was a pilot programme on marine science and technology. MAST II runs from 1991 to 1994 and its specific objectives are:

- to contribute to a better knowledge of the marine environment and its variability, in order to improve its management and protection and to predict change;
- to encourage the development of new technologies for the exploration, protection and exploitation of marine resources;
- to improve transnational coordination and cooperation amongst marine RTD programmes in the member states, and to help increase the effectiveness of these programmes through better use of research facilities, and to promote the transfer of expertise and knowledge;
- to provide the technical basis for, and encourage the development of, common norms, standards and design guidelines;
- to facilitate training and exchange of personnel;
- to assist (as far as possible) Community participation in international ocean programmes.

Technical Coverage

MAST II is divided into 5 areas. These are described briefly below:

Area I: Marine Science

The objective is to study marine processes and fluxes in European coastal waters, in the seas surrounding the Community, in the North Atlantic ocean and in subpolar Arctic seas. Topics include circulation and exchange of water masses, biogeochemical cycles and fluxes, interface and boundary processes, biological processes and marine geosciences.

Area II: Coastal Zone Science and Engineering

The objective is to gain a better understanding of coastal physical processes and morphodynamics, and to promote the application of modern principles in coastal engineering and management.

Area III: Marine Technology

The objective is to encourage the development of existing and new instruments required by marine science and to promote enabling technologies necessary for the advancement of marine science and related future industrial developments. Topics include instrumentation for science, underwater acoustics, exploitation of marine biological resources and enabling technologies (such as underwater signal transmission, imaging, marine applications of modern robotics and testing advanced materials/components for use in marine instrumentation).

Area IV: Supporting Initiatives

These include European ocean data and information exchange, preparation of norms and standards for marine science and technology, modelling coordination, research vessel and equipment coordination, design of large scale

facilities, advanced training and new approaches for surveying and mapping.

Area V: Large Targeted Projects

The objective is to address problems which require large-scale multidisciplinary coordinated research efforts. For the moment, two projects are planned. Topic V.1 focuses on the Mediterranean and topic V.2 on the North Atlantic.

Funding and Timescale

The budget foreseen for these activities over the duration of the programme is 33 MECU for area I, 13 MECU for area II, 27 MECU for area III, 4.5 MECU for area IV and 14 MECU for area V.

Calls for proposals in Areas I, II, III, V1 and V2 are now closed and projects have been selected.

Area IV is not open to a call for proposals. The process of adopting ideas in this area is meant to be continuous over the duration of the programme.

MAST will receive a top-up of 14 MECU early in 1993.

Participation

The programme is open to all persons and organisations established in the Member States of the European Community, including industrial firms, universities, higher education institutes and research organisations. Non-member states can also participate if they have an agreement on Science & Technology cooperation with the Community.

Research in areas I (Marine Science), II (Coastal Zone Science and Engineering), III (Marine Technology) and V (Large Targeted Projects) will be implemented by means of shared-cost contracts and concerted actions. Most of the supporting initiatives described in area IV will be carried out by means of a variety of accompanying measures.

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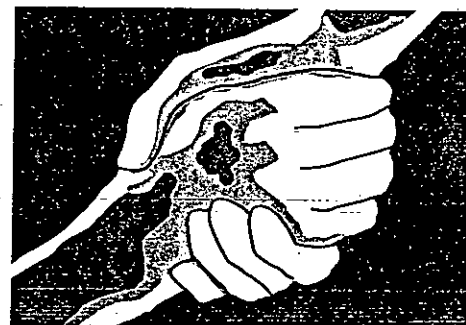
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BIOTECH



Introduction

The BIOTECH programme, for research in the field of biotechnology, covers the period 1992-1996. It complements the BRIDGE programme which was launched in January 1990 and ends in December 1993.

BIOTECH is orientated more towards basic biology than was BRIDGE and is a programme of prenormative research, with emphasis on the safety assessment of new techniques and novel products. It aims to foster transnational research, and to add to basic biological knowledge and develop application technologies for agriculture, industry, health, nutrition and the environment.

Technical Coverage

The programme supports research in the following areas:

- 1) Approaches at the Molecular Level, including the structure and function of proteins involved in the essential functions of living cells, studies of gene structure and function, and the expression of genes.
- 2) Approaches at the Cell and Organism Level, including cell regeneration mechanisms, knowledge and control of cell development, methods of in vitro testing of the toxicity of new molecules, and improvement of knowledge of the metabolism of plants, microorganisms and animal livestock and of intercellular communication systems.
- 3) Ecology and Biology of Populations, including the impact of biotechnology on the environment, and problems of conservation of genetic resources.

Provision will be made for applications of information technology to these areas.

Participation

The programme is open to all persons and organisations established in Member States including small and medium sized enterprises, large industrial firms, universities, higher education institutions and research organisations.

Proposals must involve at least two independent partners established in different Member States.

The Commission will provide for 50% of the total cost for shared-cost research projects (100%

of the marginal costs for universities and similar organisations). For concerted research actions, coordination costs (eg for meetings, travel expenses and reports) will be met.

Management of Programme

Management of the programme is the responsibility of the European Commission assisted by a Regulatory Committee. The Regulatory Committee is composed of representatives of each Member State and gives regular advice to the Commission on the programme, including the final selection of projects.

The Office of Science and Technology have lead responsibility for managing the UK's participation in the programme.

Status Report

Negotiation for the first round of contracts is expected to start in 1992.

Funding and Timescale

BIOTECH is a 4 year programme with a total budget of 164 MECU from the third Framework Programme (1990-1994). Of this 1.64 MECU will be drawn for the centralized activity of dissemination and exploitation of the results. It is anticipated that 143 MECU will be available for research activities, divided between shared-cost research projects and concerted actions, with the remainder being accounted for by provision for training and management costs. The first call for proposals was in July 1992 for research contracts due to start in February of the following year. The second call for proposals is expected in April 1993 following a top-up of 22 MECU.

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Agriculture and Agro-Industry, including Fisheries

Introduction

This programme forms a part of the Third Framework Programme (1990-1994) for Community activities in the field of research and technological development. It continues and supplements the activities formerly supported by the separate CAMAR, ECLAIR, FAR, and FOREST programmes.

The main objective is to provide a better concordance between the production of land and water based biological resources and their use by consumers and industry. It aims to improve the quality and variety of products; reinforce the competitiveness of businesses in line with other Community policies; contribute to better rural and forestry management; and ensure proper protection for the environment. It also promotes pre-normative research to establish a sound scientific basis for setting standards, particularly for food.

Technical coverage

The programme identifies four areas of interest:

1. Primary Production.

Including improvements to aid change towards high quality, commercially viable products for both food and non-food purposes; improved management, particularly in animal health and welfare and in remedies for over-fishing; work on soil erosion, loss of fertility, and deforestation for areas lagging in development.

2. Inputs.

Including more profitable but environmentally friendly inputs; improved strains of plants, animals, and fish (for better pest resistance, yield and quality); integrated and biological pest control systems; and new systems for monitoring and control.

3. Processing.

Including new separation, extraction and processing methods for raw materials, giving more useful products and less waste, particularly where they improve safety and maintain or increase the nutritional value of processed food.

4. End Use and Products.

Including work to give a better understanding of the characteristics required in end-use products; more reliable manufacturing processes (particularly in toxicological and quality control of foodstuffs); new processing technologies and biologically based chemical substances, with particular emphasis on biodegradable materials.

Funding and Timescale

The programme will run to 31 December 1994. The original budget was 333 MECU, but a top-up of 44 MECU will be given in early 1993.

Participation

Participants must be bodies such as universities, research organisations, and industrial firms (including small and medium-sized enterprises). Normally the participants must be established within the EC but participation from other members of COST may be permitted. In all cases at least two independent partners established in different Member States are required.

For shared-cost projects the Commission will normally pay up to 50% of total expenditure, although universities and the like may opt instead for 100% funding of additional marginal costs. "Concertation" (eg the organisation of seminars and workshops, and exchanges of research workers) will attract 100% funding of the administrative costs only.

Management of the Programme

The European Commission is responsible for management of the programme. It is assisted by a committee of representatives of the Member States. The lead UK representative is Dr M Parker.

Status Report

A second call for proposals was published in the "Official Journal of the European Communities" on 2 July 1992, with a closing date of 30 October 1992. A third call will probably be published in 1993.

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Biomedical and Health Programmes



Introduction

The Biomedical and Health Research Programme (BIOMED I) follows on from, and builds upon, the fourth Medical and Health Research Programme (1987-91, MHR4). It was approved by the Council of Ministers on 9 September 1991.

Its objectives are to contribute to improving the efficiency of medical and health research and development in Member States, in particular:

- by better coordination of Member State's research and development activities;
- by application of the results through the Community cooperation and a pooling of resources;
- by encouraging basic research in the field of biomedicine and health throughout the Community.

Technical Coverage

Area 1 - Development of coordinated research on prevention, care and health systems

This area covers the harmonisation of methodologies and protocols in epidemiological, biological, clinical and technological research including drugs and the administration of medicines, occupational medicine, biomedical technology and health services research.

Area 2 - Major health problems and diseases of great socio-economic impact
Major health problems, and economically and socially significant disease groupings will be considered, in particular the following:

AIDS
Cancer
Cardiovascular disease
Mental illness and neurological disease
The ageing process, and age-related health problems and handicaps

Area 3 - Human Genome Analysis

This area subsumed the Human Genome Analysis Programme (1990-1992) in June 1992. The research will be aimed at the completion and integration of the genetic and physical maps. In addition, the study of the genetic basis for biological functions will be pursued, as will the setting-up of a coordinating mechanism to sequence portions of the genome of major biological interest.

Area 4 - Research on biomedical ethics

This area will involve the study of problems relating to the research carried out in areas 1 to 3 of the Programme, and the possible applications of the research results.

Work will deal with evaluation of questions of biomedical ethics linked with the present research Programme on biomedicine and health, and evaluation of the social impact of the Programme and the risks (including the technological risks) which might be associated with it.

Funding and Timescale

The total budget available for the BIOMED I Programme is 133 MECU divided between the 4 research areas as follows:

Area 1 - 27.5 MECU
Area 2 - 72 MECU with 25 MECU for AIDS research
Area 3 - 27.5 MECU
Area 4 - 4.6 MECU

The first call for declarations of intent to participate in the Programme (areas 1,2 and 4 only) was announced during October 1991 and had a deadline of 31 January 1992. Following the submission of full proposals and evaluation by peer review during the summer, 114 projects were awarded funding.

The second and final call for full proposals was published in two parts:

(i) Area 3 Human Genome Analysis

The only call for proposals in this area was published during December 1992 and had a deadline of 29 January 1993. The Human Genome Analysis areas is the only area of BIOMED I to operate shared-cost contracts.

(ii) Areas 1, 2 and 4

The second and final call for proposal in these areas was published during December 1992 and had a deadline of 26 February 1993.

Following evaluation of the proposals received under calls (i) and (ii) above, it is hoped that successful projects will start around the beginning of October 1993.

There is an open call for fellowships: the selection committee will meet three times a year, in March, June and November, with deadlines for submission of 15 January, 15 April and 15 August respectively.

The Biomed and Health programme will receive a top-up of 18 MECU in early 1993.

Participation

The Programme is open to all persons and organisations established in the Member States of the European Community (industrial firms - both large companies and SMEs - Universities and Higher Education Institutes, Research Organisations, etc.)

The projects must involve at least two mutually independent partners established in different Member States. Non-Member States which have signed an agreement with the Community for full association with the Programme are Austria, Finland, Norway, Sweden, Switzerland and Turkey.

Forms of Support

Support in areas 1,2 and 4 will be by concerted action only; approved use of such funds include:

- the organisation of meetings of all sizes
- scientific and administrative support
- short-term international exchanges of personnel
- preparation and distribution of materials and reference products
- centralised data handling, storage and statistical analysis
- dissemination of information and results.

Shared cost contracts will be available under Area 3.

Accompanying measures include seminars, workshops, conferences, studies and training fellowships.

Management of the Programme

The management of the Programme is ultimately the responsibility of the European Commission (DGXII) which undertakes the day-to-day organisation of the Programme. In addition, the Programme Advisory Committee (Committee of an Advisory Nature, CAN) consisting of Government representatives and experts from each Member State, acts as an independent advisory body and approves the Commission's proposals on such issues such as evaluation, the participation of third countries etc. The UK is represented by the Medical Research Council (MRC) and by the Department of Health. MRC has the lead responsibility.

CONTINUED
MARCH 1993

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Life Sciences and Technologies for Developing Countries: STD 3

Introduction and General Objectives

STD forms part of the Framework Programme for Research and Technological Development. It is not linked to a specific Community co-operation policy (ACP, Mediterranean countries, ALA), but seeks to stimulate simultaneous study in various parts of the world of specific scientific issues which can contribute to progress in all developing countries. The main objective of STD 1 (1982 - 1986) was to support Europe's strong tropical research potential. STD 2 (1987 - 1991) sought in addition to build the R&D capacities of developing countries. The current programme (1991 - 1994) seeks more specifically to boost the input of R&D on development. Its general objectives are:

- To raise awareness among the scientific community of the scale of problems in the developing world.
- To improve the co-ordination of Member States' R&D initiatives for development and step up consultation between scientists.
- To ease the introduction of scientific and technical aspects in the development co-operation activities supported by the Community and its Member States.
- To contribute to steering the research of European institutions specialising in the study of the tropics and ensure their coherence with Community development and technological research strategies.
- To bring institutions and scientific research teams in developing countries up to a level of excellence enabling them to be full partners, thus reducing North-South disparities in science and technology.
- To contribute to the emergence of a "critical mass" of national researchers able to carry out original research in areas useful for the development process.

Technical Coverage

In order to ensure maximum efficiency, the STD programme has focused on major development problems and, since 1982, has covered two main areas:

- Tropical and sub-tropical agriculture.
- Medicine, health care and nutrition in tropical and sub-tropical regions.

Joint research

From the outset, STD was open only to research projects which involved at least two teams, one belonging to the Community and

the other from a developing country. Under the third Framework Programme (1991 - 1994), projects are obliged to pool the potential of at least two Community teams and at least one from a developing country. Scientists in the developing countries have direct access to the STD programme funds from the Community budget, and can thus define their research priorities and choose their partners themselves.

Funding and Timescale

111 mecu are available for 1991 - 1994. The indicative breakdown of funds available for research and accompanying measures is 71.43 MECU for agriculture and 38.46 MECU for medicine, health and nutrition. The remaining 1.11 mecu represent the contribution of STD 3 to the centralised scheme for the dissemination and exploitation of the results of Community research.

Life sciences will receive a top-up of 15 MECU early in 1993.

Joint research projects are selected on the basis of replies to calls for proposals published in the Official Journal of the European Communities. For STD 3 there are three calls for proposals in 1991, 1992, 1993 respectively.

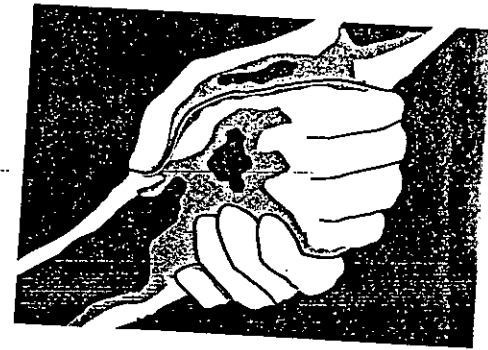
Community contributions to R&D are always up to a maximum level of 50% of total research costs. However, for higher education institutions and all institutions in developing countries the Community contribution can reach 100% of the marginal costs of a project. The purchase of durable equipment may also be 100% financed.

Each project must include at least two teams from different EC Member States and one or more teams from developing countries.

The Commission has produced a full information package giving all the details necessary for submitting an application for the STD 3. It is available in the nine Community languages from:

Commission of the European Committee,
Directorate-General for Science, Research and Development
DGXII-G-4,
Division for Scientific and Technical
Co-operation with Developing Countries,
Rue de la Loi, 200,
B-1049 Brussels.
Tel: 010-322 235 1731
Fax: 010-322 236 3308

Energy Programmes



In the new Framework Programme (1990-94) the main aim of the energy programmes will be to develop sound, affordable, environmentally safe energy technologies designed to improve the Community's energy balance.

The energy programmes involve two main fields of research: nuclear and non-nuclear.

Nuclear Programmes

The nuclear programmes coming forward under the Third EC R&D Framework Programme are in the areas of thermonuclear fusion and nuclear fission safety. This last is a composite programme with a reactor safety element overseen by the Department of Trade and Industry, and a radiological protection element for which the Department of Health is responsible. The aim of the reactor safety research is to consider how the safety of future reactor types can be assured, and to improve public confidence in probabilistic safety assessments. Studies will consider intrinsically safe reactor types, containment of radioactivity under severe accident conditions, integrity of containment systems, and management of human behaviour. Much of this work will be performed by the Community's Joint Research Centre. The balance will be taken up by means of shared-cost action projects.

The Community Fusion Programme seeks as its long-term objective the creation of safe, environmentally sound prototype reactors. The main effect of the current proposal, if agreed, would be an extension of the life of the Community's JET Project, hosted by the UK at Culham in Oxfordshire, from 1992 to 1996. The prolongation would be used to attempt to establish reliable methods of plasma impurity control, in conditions close to those of a next step tokamak device. In addition, existing nuclear programmes on decommissioning of nuclear installations and on remote handling techniques (TELEMAN), are continuing.

Non Nuclear Programme

The new non-nuclear energy programme will cover research into renewable sources of energy, energy utilisation and conservation, minimum emission power production from fossil fuels and analysis of strategies and modelling of energy demand, use and environmental impact. Research in these fields will be open to suitable industrial and academic organisations.

Status Report

Funding for new projects in the 1993/94 application round has been restricted to applications from existing UETPs under strands BA, Bc, Ca and D of the programme.

The Energy Programme will receive a top-up as follows in early 1993:

Non-Nuclear	60MECU
Fission Safety	29MECU
Nuclear Fission	110MECU

Plus 50MECU to be allocated, with priority to non-nuclear energies.

Contacts

Non-nuclear Programmes

UK

Mr D Irving
Department of Trade and Industry
Room 3.4.9
1 Palace Street
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SW1E 5HE
Tel: 071-298 3318

Commission

Mr M Trousson
Tel: 010-322 295 3978

Contacts for Nuclear Programmes

1. Nuclear Fission Safety

UK

a) Radiation Protection

Dr H Walker
Dept of Health
Room 917a
Hannibal House
Elephant & Castle
LONDON
SE1 6TE
Tel: 071-972 2157

b) Reactor Safety

Mr J Verney
Health & Safety Exec.
Broad Lane
SHEFFIELD
S3 7HQ
Tel: (0742) 768141 (ext.3404)

Commission

Mr J L Lamy
DGXII
Tel: 010-399 235 1111

2. Controlled Thermonuclear Fusion

UK

Mr B Freeman
Dept of Energy
Rm 4.2.8
1 Palace Street
LONDON
SW1E 5HE
Tel: 071-238 3771

Commission

Mr P Kind
DG XII (as Above)

3. Decommissioning

UK

Mr P Hubbard
Dept of Energy
Rm 4.2.10
1 Palace Street
LONDON
SW1E 5HE
Tel: 071-238 3654

Commission

Mr R Simon
DG XII
(as above)

4. Teleman

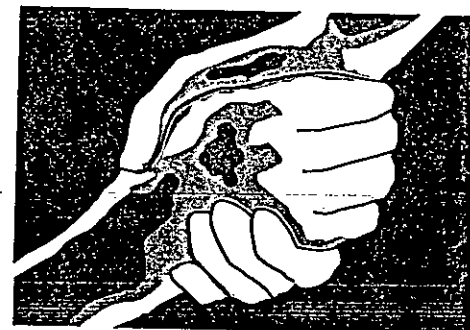
UK

Mr T Hayward
Dept of Energy
Rm 4.2.7
1 Palace Street
LONDON
SW1E 5HE
Tel: 071-238 3798

Commission

Mr J L Lamy

Human Capital and Mobility Programme



Introduction

The Human Capital and Mobility programme (1991-94) aims to extend and develop the "SCIENCE", "SPES" and Large Facilities programmes implemented under Framework Programme 2. Its central objective is to help increase the quantity and quality of human resources required for research and technological development by the EC Member States in the coming years.

Technical Coverage

The programme covers all the exact and natural sciences, including mathematics and engineering sciences, and the human and social sciences. Action is focused on four activities:

Activity 1: The development of a Community system of research training grants, intended primarily for young post-doctoral fellows. There are two types of grant, generally lasting for up to two years: individual fellowships given on the basis of joint institute-researcher proposals, and those allocated via pre-selected host institutions to groups of fellows. The programme allows for up to 15% of funds to go to host institutions and to the Commission to pay for associated research expenses and administration costs.

Activity 2: The creation and development of scientific and technical cooperation networks. As a general rule proposals should consist of 5 or more centres in at least 3 Community countries, although twinnings or networks of fewer than 5 centres in different Member States may exceptionally be supported provided they assist in the creation of a genuinely European scientific and technical Community. Grants will normally cover 100% of the marginal costs of each project (60% for the subsistence and mobility costs of researchers themselves; 40% for certain expenses related to research and administration).

Activity 3: Provision of access for researchers to large-scale scientific and technical installations. This activity is aimed particularly at enhancing access for young post-doctoral researchers from other Member States. Of the total amount granted, 40% covers expenses related to the researchers themselves (subsistence, mobility, publication of results). The remaining 60% is related to the use of equipment, its adaptation or improvement, as well as management costs.

Activity 4: The launching of a Community system of R&D Euroconferences. Each Euroconference generally comprises a series of several high-level meetings where young European researchers can discuss with specialists the latest work and ideas in advanced and innovative scientific or technical areas. EC grants cover expenses related to the participation of young researchers attending the conferences (registration, travel and subsistence).

Funding and Timescale

The total budget is 518 MECU, of which 25 MECU is reserved for direct action by the Community's Joint Research Centre and 4.93 MECU is earmarked for the centralised dissemination and exploitation of results. The remaining 488.07 million ECU (some £390 million) is distributed among the different activities as follows:

Activity	MECU	(£m approx)
Training	220.00	(155)
Networks	200.00	(140)
Access to major installations	55.00	(40)
Euroconferences	13.07	(10)

Calls for individual fellowships under Activity 1, and for Activities 2 and 4 are open continuously and applications may be sent to the Commission at any time. Calls for grouped fellowships (Activity 1) are held once a year: the next is expected at the end of 1993. There are no further Calls planned for Activity 3. Human Capital and Mobility will receive a top-up of 69 MECU early in 1993.

Participation

To be eligible, all proposals must have participants from at least two Member States.

Organisations or individuals from non-Member States which have signed a full association agreement with the EC can participate in the programme under the same terms and conditions as Member State participants. Other European countries which do not have full association status but do have agreements on science and technology cooperation with the Community may participate in the Programme on a project by project basis. They will not, however, receive any Community funding.

Contacts

UK

Office of Science and Technology telephone information line:
071-925 6422

Mr J Walsh
Science and Engineering Research Council
Polaris House
North Star Avenue
SWINDON
SN2 1ET
Tel: (0793) 411269
Fax: (0793) 411152

Commission

Dr D de Nettancourt
DG XII
Commission of the European Communities
Rue de la Loi 200
B-1049 BRUSSELS
Belgium
Tel: 010-322 295 4044
Fax: 010-322 296 3307

Information packs

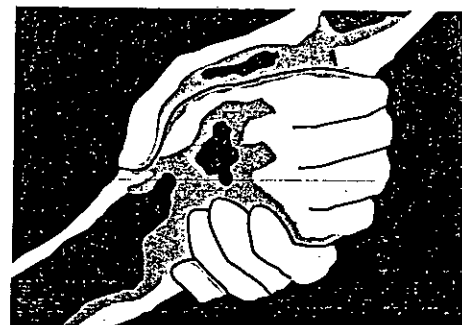
Information packs, which contain application forms and explain how to apply, can be obtained from the Commission by telephoning or faxing the following numbers:

Tel: 010-322 296 0254 (answering machine)
Fax: 010-322 296 3307

COMETT

Community Action

Programme for Education and Training for Technology



Introduction

The programme aims to strengthen and stimulate Community-wide co-operation between higher education establishments and industrial or other enterprises in respect of technological training.

The first phase was from 1987-1989 and the second 5 year phase, COMETT II, began in January 1990. COMETT II is open to EFTA countries. The objectives are:

- to improve the provision of advanced technology training and the contribution of training to the economic and social development of the Community;
- to encourage the joint development of training programmes and the exchange of experience through the creation of a transnational sectoral and regional network of advanced technology training projects;
- to respond to the specific skill requirements of small and medium sized businesses;
- to promote equal opportunities in the provisions of advanced technology training;
- to provide a European dimension to co-operation between universities and industry in the provision of advanced technology training.

Technical Coverage

Grants are paid to projects in four main areas.

1. Strand A - European Networks - UETPS

Development and support of existing University-Enterprise Training Partnerships (UETPS) and the extension of this network on both a regional and sectoral basis, to encourage transnational co-operation by:

- identifying and resolving advanced technology training needs;
- assisting the development of other projects within the other strands of the COMETT Programme;
- strengthening co-operation and inter-regional transfer between Member States in the development of training provision for the application and transfer of advanced technology;

- developing links in the form of transnational sectoral networks bringing together projects from various strands of the programme in the same area of training.

2. Strand B - Transnational Exchanges of Students and Personnel between Universities and Enterprises.

COMETT will provide grants for placements of 3-12 months duration for Higher Education students in enterprises in another Member State. Fellowships will also be provided for secondments of university staff to enterprises in other European Countries for a 3-12 month period to enable them to develop their industrial experience in a European context. Similarly, fellowships will be provided to enable personnel from industry to spend a period on secondment to a university in another European Country for 3-12 months to enable them to diversify their training.

3. Strand C - Development of Joint Projects for Training in Advanced Technology and for Multimedia Distance Training.

Providing financial support for the development of training courses including distance training with a European dimension, in advanced technology, designed to disseminate quickly the results of Research and Development, with particular emphasis on small and medium sized businesses.

4. Strand D - Complementary Promotion and Back Up Measures

Provides support for a series of complementary measures, including preparatory measures, skills analysis on COMETT activities and a continuing evaluation of the whole programme.

Participation

New partners may participate in COMETT but only through existing UETPS. A list of UETP coordinators can be obtained from the COMETT Liaison office.

Industrial firms including Small and Medium sized Enterprises (SMEs), Higher Education Institutes and Research Associations are eligible to apply for funding of collaborative projects or exchange schemes. Activities supported must fall within one of the four areas mentioned above, but priority is given to those related to more than one area. The COMETT financial contribution may cover up to 50% of total project costs except for the transnational exchanges where a flat rate contribution per person is made which takes account of the exchange made.

Management of the Programme

Management of the programme is the responsibility of the European Commission assisted by a committee with 2 representatives from each Member State. The Technical Assistance Office gives advice on various technical aspects of the programme.

Status Report

Funding for new projects in the 1993/94 application round has been restricted to applications from existing UETPS under standards Ba, Bc, Ca and D of the programme.

Funding and Timescale

COMETT II will run five years from January 1990 to December 1994 with a budget agreed at this stage of 200 MECU spread across this period. The budget for the EFTA countries is 30 MECU.

Contacts

Mr NRC Comport
COMETT Liaison Office
Department for Education
Sanctuary Buildings
Great Smith Street
LONDON
SW1P 3BT
Tel: 071-925 5254
Fax: 071-925 6985

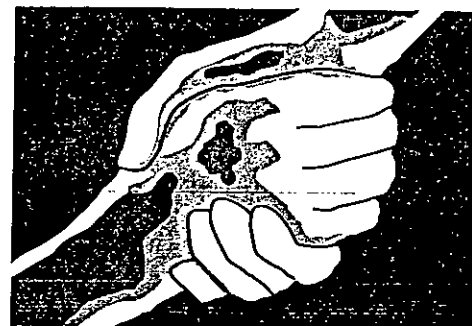
Mr T Benjamin
Department of Trade and Industry
Enterprise Initiative Division
Bay 543
Kingsgate House
66-74 Victoria Street
LONDON
SW1E 6SW
Tel: 071-215 2867

Commission

COMETT Technical Assistance Office
14 Rue Montoyerstraat
B-1040 BRUSSELS
Belgium
Tel: 010-322 513 8959
Fax: 010-322 513 9346

COST

European Co-operation in the Field of Scientific and Technical Research



Introduction

COST provides a mechanism for European scientific and technological collaboration which complements the European Community's research and development programmes. It was established by a European Ministerial Conference in 1971. The membership comprises the EC Member States, Austria, Finland, Norway, Sweden, Switzerland, Turkey, Yugoslavia, Iceland, Hungary, Poland, and Czechoslovakia.

COST operates through a series of co-operative projects which enable a variable number of participants to undertake research in areas of common interest and to exchange the results amongst themselves.

There is no statute establishing COST, enabling it to work within flexible, pragmatic operating rules agreed by the Member States. For each individual COST project the form of co-operation is therefore defined in simple, purpose built agreements.

Technical Coverage

COST co-operation covers the following areas:

1. INFORMATICS
2. TELECOMMUNICATIONS
3. TRANSPORT
4. OCEANOGRAPHY
5. METALLURGY AND MATERIALS SCIENCE
6. ENVIRONMENT
7. METEOROLOGY
8. AGRICULTURE AND BIOTECHNOLOGY
9. FOOD TECHNOLOGY
- A. SOCIO-TECHNOLOGIES
- B. HEALTH AND MEDICAL RESEARCH
- C. CIVIL ENGINEERING

The COST mechanism has proved suitable for several types of problems including those of an intrinsically international nature, eg. oceanography and environment; problems which are common to many COST Member States and which can benefit from joint actions eg. data processing, materials, agriculture and food technology; and problems needing international harmonisation of standards, eg. telecommunications and transportation, COST has established groups to examine the possibility of COST activity in a number of fields, including social sciences and chemistry.

Funding and Timescale

COST activities operate without any central funding towards the research expenditure. Additional expenditure is often minimal as research relating to a particular project is generally already underway. In most cases the European Commission provides a secretariat. Non-EC COST states taking part in those projects which have been incorporated into Community programmes contribute towards co-ordination costs. The European Commission pays the co-ordination costs of EC countries in such projects. Participants are responsible for all costs in COST projects outside Community programmes once they are underway.

COST is an on-going collaborative mechanism with no set end date. The extent and duration of projects is recommended in the relevant Memorandum of Understanding (see Participation).

Participation

Any COST Member State may propose a new research topic. If any other COST Member States are interested in collaboration this may lead them to set up an agreement between themselves known as a Memorandum of Understanding. This has no binding effect in international law and is merely a declaration of intent indicating a willingness of the signatory Member States to participate in the COST activity. Countries normally choose to participate in a particular project if they are already involved at national level in research in the field under consideration, or intend to initiate a national project.

Because of the nature of COST research activities, participants have been primarily administrations, research institutes and research centres belonging to the public sector, but an increasing number of projects involve participants from industry. Potential participants would normally be sought during the formative stage of a COST proposal to establish the level of interest prior to signing a Memorandum of Understanding and Implementation. A project Management Committee is then set up to implement the new COST activity.

Organisations from non-COST countries can participate in COST projects with the approval of the appropriate Management Committee and the Senior Officials Committee (see Management of the Programme).

Management of the Programme

Decisions on whether proposed COST projects should be undertaken and on participation are taken by the Committee of COST Senior Officials. This committee, which meets four times a year, is composed of representatives of the 19 COST Member States and the Commission of the European Communities.

Status Report

The UK is a signatory to most of the projects of industrial interest on the COST project list overleaf. Information on specific projects can be obtained by contacting the individual concerned. Additionally there are other projects in which the UK is involved but come under the remit of other Government Departments. Details of these can be obtained from the COST Secretariat at the Cabinet Office.

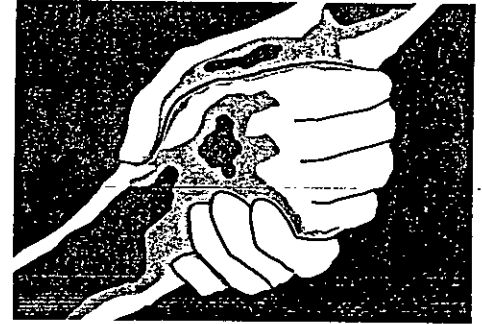
Contacts

Further general information about COST can be obtained from the Cost Secretariat, but enquiries about specific COST activities should be made to the contact persons detailed in the following list:

COST Secretariat
Cabinet Office
Room 421
70 Whitehall
London SW1A 2AS
Tel: 071-270 0081

EUREKA

A European Collaborative Initiative that Complements the EC R&D Programmes



What is EUREKA?

EUREKA is a European initiative aimed at facilitating industry led, market driven, collaborative projects in all sectors of technology with the objective of introducing new products, processes and services with world market relevance.

EUREKA is complementary to the EC R&D programmes in that it is generally more concerned with the commercial exploitation of research. It is concerned with strengthening Europe's technological base, removing barriers to commercial success in the European market, and improving competitiveness in world markets.

EUREKA members are the 12 countries of the EC and Hungary, the 6 countries of EFTA, Turkey, and the European Commission participates in EUREKA as an equal member.

EUREKA projects can be in any technological area provided that the simple EUREKA criteria are met. These key criteria are that the project must comprise at least two organisations from at least two EUREKA countries, and that the project must involve technical innovation. Current projects mostly fall into one of the following nine categories; (these categories should not however be seen as programmes as there are no priority areas where Governments are seeking project proposals):

- Communication
- Energy
- Environment
- Information Technology
- Lasers
- Medical/biotechnology
- New materials
- Robotics and Production Automation
- Transport

Since its launch in 1985 EUREKA has embraced 8.8 BECU (£6.2bn) of agreed projects; there are now 623 EUREKA projects. Currently, 602 UK organisations are involved in 174 EUREKA projects, and UK companies take the lead in 56 of these.

EUREKA Umbrellas

The National Project Co-ordinator network can help you find partners by bringing your project proposal to the attention of organisations in other member countries. The UK EUREKA Unit is situated in the Research and Technology Policy Division of DTI. In addition there are specialist technology umbrellas which promote loosely structured packages of R&D in given fields. These are:

FAMOS	FLEXIBLE AUTOMATION
EUROENVIRON	TERRESTRIAL ENVIRONMENT
EUROLASER	LASER TECHNOLOGY
EUOMAR	MARINE ENVIRONMENT
EUROCARE	PRESERVATION OF THE PHYSICAL HERITAGE
MAINE	MAINTENANCE OF CAPITAL EQUIPMENT
EUROVOLTAIC	SOLAR POWER
EUROAGRI	FOOD INDUSTRY
EUROSURF	SURFACE ENGINEERING
EUROBOND	ADHESIVES
DIAGNOSTICS	DIAGNOSTICS

Other Umbrellas in the pipeline are Adhesives, Surface Engineering, Railway Transport and Diagnostics.

Projects are proposed and run by firms and research institutes; bureaucracy is kept to a minimum. UK firms are encouraged to take the lead in creating new EUREKA projects.

Funding For Project Participants

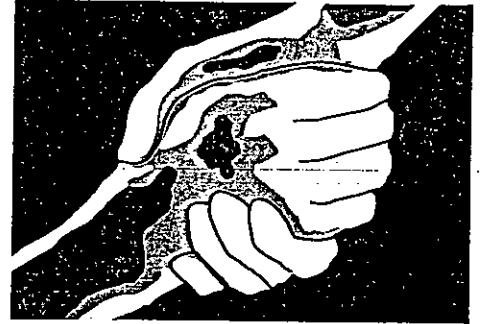
Participants in EUREKA can obtain funding from their own national governments. (Some funding may also be available from other Government Departments). Government support must be shown to significantly influence the scope or scale of the project. In addition, projects should be innovative and technically realistic, and there should be reasonable prospects of eventual commercial exploitation. Further, the resources devoted to the project (managerial and technical) should be sufficient to ensure effective completion of the project.

Contact

For further information on EUREKA please contact the EUREKA Enquiry Point.
Tel: 071-333 5161.

! EUREKA

EURET



Introduction

The EURET programme was approved by the Council of Ministers in December 1990, as part of the Second Framework Programme. It is the first research programme to be managed by DGVII (Transport).

The broad aims of the programme are to improve the effectiveness and competitiveness of European transport systems, improve their safety and reduce their harmful effects on the environment. The stated objectives are to optimize transport-network exploitation, to optimize logistics and to reduce harmful externalities.

There are 11 sub-programmes, of which seven are shared-cost and four concerted actions.

Technical Coverage

The main tasks are:

Rail Traffic Management

To design a control system for rail traffic, both passenger and goods, to evaluate location and transmission equipment and develop the main software components of the system;

Vessel Traffic Services (VTS) Systems

To assess the benefits and feasibility of measures which would make the best use of investment already made or now being made in VTS;

Air Traffic Management:

(a) To define, develop and evaluate the applications, requirements and methods of data exchange between ground and airborne systems and between the pilot and controller as a means of backing up voice communications; and

(b) To improve automated support to air traffic controllers resulting from the development of new controller work stations;

Intermodal Freight

To design and evaluate an innovative and efficient system of rapid loading and unloading of goods between different modes of transport;

Manning of Ships:

(a) To determine the optimum crew composition for different types of ship according to different circumstances, taking into account an increased use of advanced technology;

(b) To assess a better match between the ship (and its equipment) and human behaviour by assessing the tasks assigned to crew members and their behaviour in various operational situations and to develop measures to reduce human error.

Funding and Timescale

EURET has a budget of 26.8 mecu over the period 1990-1993. All the shared-cost contracts were signed in early 1992 and most will run on into 1994.

Management of the Programme

Management of the programme is the responsibility of the European Commission assisted by a committee composed of two representatives from each Member State.

Contacts

UK

Mrs Anthea Nicholson
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P2/046A
2 Marsham Street
London SW1P 3EB
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Fax: 071-276 5875

Commission

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Tel: 010-322 296 8250
FAX: 010-322 296 8350

EC Funding for Environmental Demonstration Projects: The Life Programme

The European Community's Financial Instrument for the Environment (LIFE) came into force on 22 July. The main objective of the LIFE programme is to contribute towards implementing EC environmental policies and legislation. The LIFE Regulation lists 'actions' under five 'fields' which define the scope of the programme:

- promotion of sustainable development and the quality of the environment;
- protection of habitats and of nature;
- administrative structures and environmental services;
- education, training and information; and
- actions outside Community territory.

For many years the Community has been financing research and development programmes, the results of which can be exploited by demonstration and pilot projects. Under LIFE, demonstration schemes, awareness campaigns and actions providing incentives or technical assistance will be eligible for assistance. Scientific and technical research is not included.

The first of the 'fields' includes the promotion of new clean technologies ie those which create little or no pollution, and make fewer demands on resources. The Commission has targeted five industrial sectors in calling for demonstration projects. These are:

- surface treatments (eg metal plating, ceramics);
- textiles;
- tanneries;
- paper industry; and
- the 'agri-food' industry (eg dairies).

The Commission issued a call for tenders for new clean technology projects (Official Journal OJ92/c 336/12) on 19 December 92. Project applications must be received by the Commission by 31/3/93. Projects are likely to be at least £500,000 in total cost with a maximum EC contribution of 30%

Technological innovation is expected to play an important part in other priority 'actions' within the LIFE programme, including:

- techniques to rehabilitate contaminated land;
- waste reduction and recycling; and
- modernising monitoring networks.

Priorities for the programme are appraised annually. A further call for proposals is expected in Autumn 1993.

Contacts

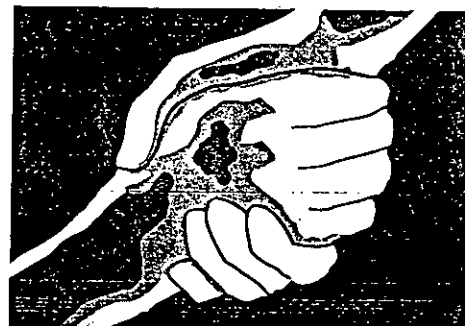
UK

Richard Longman
DOE/EPC, Room A132,
Romney House,
43 Marsham Street,
London SW1P 3PY
Tel: 071-276 8146 or 8114

EC

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Rue de la Loi
200
B-1049
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MONITOR: A Community Programme in the Field of Strategic Analysis, Forecasting and Evaluation in Matters of Research and Technology



Introduction

MONITOR aims to identify new directions and priorities for Community Research and Technological Development (RTD) policy and to help show more clearly the relationship between R & D and other common policies. The programme is thus mainly aimed at giving input to the Community RTD policy.

It was adopted by the Council of Ministers on 27 June 1989.

Technical Coverage

The programme has three specific and complementary activities: SAST, FAST, and SPEAR.

1.SAST: Strategic Analysis in Science and Technology

The aim of SAST is to identify, for a given problem, the available options and give precise recommendations for action.

SAST research actions can take from a few months up to 12 or 18 months. They typically include:

- (a) the assessment of the strengths and weaknesses of the European Community in a specific sector;
- (b) the assessment of the state of development of a technology and its future evolution;
- (c) the determination of the likely social, economic and, where appropriate, environmental impact of a selected scientific or technological development.

Current SAST projects include studies on the potential for S&T co-operation between selected advanced developing countries and the Community, the role of S&T policy in standards-setting, a research and technology strategy to help overcome environmental problems in relation to transport, a strategy for biotechnology research directed towards farming, forestry and the agro-industry, the identification of technology priorities for European RTD, S&T policy in relation to water resource use and quality problems, environmental problems associated with the disposal and recycling of plastics, and the impact of the service sector on technological innovation.

2.FAST: Forecasting and Assessment of Science and Technology

The FAST activity is an oriented follow-up of the previous FAST programmes (FAST I 1978-1983, FAST II 1984-1987). It studies scientific and technological developments and the interactions with economic and social changes in the Community in the light of world-wide developments.

The research actions have a duration of up to two years and include:

- (a) Prospective Dossiers on major topics or phenomena of a global character that may extend beyond the strictly European framework (for example S&T and social and economic cohesion, the globalisation of technology and the economy, the long-term development of major world regions, the future of urban societies);
- (b) Applied Technology Assessments on the implications and consequences of selected scientific and technical developments (for example, the development of anthropocentric technologies and production systems, technologies related to health treatment);
- (c) Syntheses giving a critical analysis of the main forecasting studies published worldwide in specific fields (for example, the biosphere, and other futures scenarios).

3.SPEAR: Support Studies for the Evaluation of Community R & D

The aim of SPEAR is to provide the Commission with improved theoretical and methodological tools for the evaluation of the social and economic impact of its RTD programmes.

The research actions include:

- (a) methodological studies to improve the methods used to conduct evaluations of Community RTD programmes, to measure the impacts of R&D programmes, to develop indicators and to draft guidelines for evaluations.
- (b) horizontal evaluations, which cover particular activities or mechanisms common to several RTD programmes (for example, the effects of Community RTD programmes on social and economic cohesion, training);
- (c) '12+1' Networks to enable the exchange and diffusion of ideas in the field of evaluation.

Funding and Timescale

The programme has a total budget of 22MECU for the period 1989-1993.

Participation

The SAST, FAST and SPEAR activities are to be undertaken through cross national and multi-partner projects, carried out by experts and organisations on contract, or through scientific and professional networks. The projects are initiated by the Commission and contracts awarded as a result of a closed call for tender. The projects are executed in collaboration with, and supervised by, the Commission services. The Commission pays 100% of the cost of research undertaken.

Management of the Programme

The European Commission is responsible for the management of the programme, aided by a Committee of an Advisory Nature (CAN). CAN-MONITOR consists of representatives of Member States and meets on a regular basis to advise on the structure and implementation of the programme. In the UK, the representatives are provided by DTI (see contact address).

UK National Network Node

To encourage wider participation and improve the dissemination of results, a UK Node has been set up for the programme. This is run by PREST (Programme of Policy Research in Engineering, Science and Technology) at the University of Manchester (see contact address). PREST are the first point of contact for those wishing to express an interest in MONITOR.

Status Report

The funds available for contracts have now been committed. Reports from the Monitor programme are becoming available and details are given in a regular newsletter produced by PREST. Both UK and the EC are holding a number of conferences during 1993. Please contact PREST for details.

Contacts

UK

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Oxford Road

MANCHESTER

M13 9PL

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Fax: 061-273 1123

Mrs Maureen Reeves
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Department of Trade and Industry
Research & Technology Policy Division 2a
3/181 Green

151 Buckingham Palace Road

LONDON

SW1W 9SS

Tel: 071-215 1632

Fax: 071-215 2909

Commission

Mrs Clara de la Torre
Commission of the European Communities

DGXII/H

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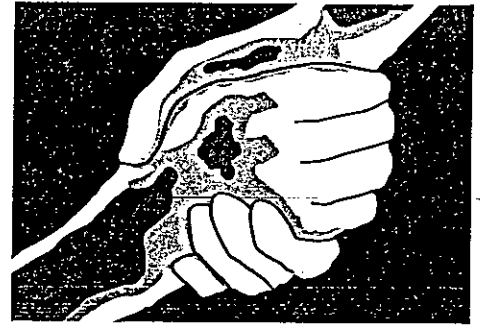
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SPRINT

Strategic Programme for Innovation and Technology Transfer



Introduction

SPRINT is a 5 year (1989-93) 90 MECU EC programme administered by DGXIII to promote innovation and technology transfer. The programme's objective is to improve the competitiveness of industry, particularly SMEs, within the Community by ensuring that technology and innovation aids can be shared across national boundaries. It is primarily aimed at stimulating intermediaries (international licensing consultants, RTOs, technical institutes, for example) to co-operate in transnational networks which facilitate licensing deals between Small and Medium-sized Enterprises or carry out joint projects to disseminate modern technology more widely. SPRINT is not part of the EC R&D Framework programme.

Technical Coverage

There are three main lines of action within the new programme.

1. Strengthening the European infrastructure for innovation services by consolidating or forming community networks of agents for technology transfer and innovation support - budget 50 MECU;
2. Supporting "specific projects" which demonstrate by practical example the intra-community transfer of innovation. In particular such projects are concerned with transferring new technologies already applied in one sector or region of the Community to another sector or region where such technologies are not used - 30 MECU;
3. Improving the environment for innovation through a better knowledge of its workings and increased "concentration", ie collaboration and exchange of experience in areas such as the use of research results, design, patents and innovation between the Member States and the Commission - 10 MECU.

Funding and Timescale

SPRINT was launched in 1983 as a three year experimental programme and further extended in 1986 for a further two years at a cost of 8.6 MECU. In March 1989 the Council of Ministers approved the third five year main phase Programme, with a 90 MECU budget.

Participation

SPRINT is open to all organisations, both public and private, whose activities include helping business - particularly SMEs - to exchange technology and to innovate, eg regional or local development agencies, innovation centres, technology transfer or licensing consultants, Research and Technology organisations and Chambers of Commerce. Proposals selected by the Commission can receive financial support of 50% of eligible costs but in practice each partner could receive 15,000-20,000 ECU per annum.

Interested parties can only apply for support following a Commission call for proposals published in the European Journal of the European Community. There is usually a three month period following publication of a call for return of proposals to the Commission.

Management of the Programme

Management of the programme is the responsibility of DGXIII of the European Commission assisted by the Consultative Committee for Innovation and Technology transfer (CIT). This is an advisory committee of government officials nominated by member states. The DTI contact on this committee is Miss Linda O'Connor. (See contacts). If you wish your name to be included on a DTI SPRINT mailing list which gives early warning of SPRINT initiatives please notify Linda O'Connor giving written details of your organisation.

Contacts

UK

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SW1W 9SS

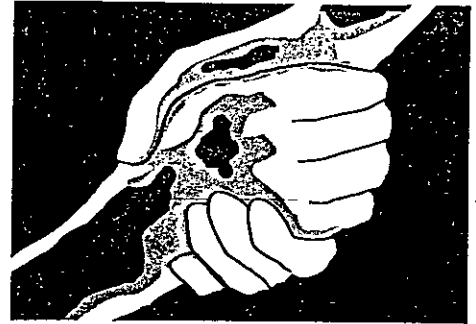
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VALUE II

Centralised Action for the Dissemination and Exploitation of Knowledge resulting from Community R&D Programmes



Introduction

VALUE stands for Valorisation and Utilisation for Europe. This programme is concerned with the dissemination and exploitation of the results of Community scientific and technological research, obtained under programmes such as ESPRIT, RACE, BRIT-EURAM and JOULE. It provides a range of services to contractors involved in Community R&D projects, to help them protect, exploit and disseminate the results of their work. It also provides information and advice on the whole range of Community R&D programmes and encourages industrial and research organisations to participate in these programmes.

The VALUE II programme forms part of the third Framework Programme. It follows on from the VALUE programme, in the second Framework Programme, which is now coming to an end.

Technical Coverage

The VALUE II Programme has three elements: the interface between research and industry, the interface between research and the scientific community and the interface between research and society.

(i) Interface between Research and Industry

This is the largest of the three elements and includes the following five activities:

(a) Relay Centres

A network of Relay Centres has been set up throughout the EC, to promote the Community's R&D programmes, to help organisations participate in these programmes and to ensure that the results arising from projects are disseminated and exploited. The Centres were set up in January 1993. There are four Relay Centres in the UK, each serving primarily one region of the UK:

- Welsh Development Agency serving Wales
- LEDU (Local Enterprise Development Unit) in collaboration with IRTU (Industrial Research & Technology Unit), serving Northern Ireland
- EuroInfo Centre Ltd in Glasgow, in collaboration with RTC North Ltd, Technology Transfer Centre and Business Info Source, serving Scotland and Northern England, including Teeside, Durham, Tyne & Wear,

Northumberland and Cumbria

- The Technology Broker serving Southern and Central England

(b) CORDIS and Publications Dissemination Service

These dissemination activities aim to promote access to and exploitation of non-confidential information generated from EC R&D projects. Information is disseminated via books, reports, articles, conference proceedings and via CORDIS, the Community's R&D Information Service, based on electronically accessible databases. CORDIS is described in detail on sheet ECR&D 28.

(c) Utilisation of Results

This activity provides finance for projects which aim to exploit results from EC R&D programmes. Exploitation projects can include getting advice on intellectual property issues, assessing exploitation potential, carrying out market studies, searching for industrial/financial partners, carrying out feasibility studies, tests and experimental developments, and getting assistance in identifying licensees and negotiating licences.

(d) Protection of Results

This activity aims to protect the intellectual property belonging to the Community (mainly the output of the Joint Research Centre) and to provide some aid and advice to organisations which have been involved in EC R&D projects but which do not have access to patenting expertise.

(e) Promotion of Results

This activity promotes the results of the EC's R&D programmes, by supporting organisations which are disseminating information on EC R&D, and by organising seminars and conferences and participating in technology fairs.

(ii) Interface between Research and the Scientific Community

This element aims to study the research environment and its impact. It has four themes: analysing and studying the Community R&D environment, improving communication of research, understanding the effectiveness and efficiency of R&D using a macro-economic approach, and studying the management of R&D.

(iii) Interface between Research and Society

This element aims to measure and analyse the impact on society of the scientific and technical knowledge resulting from the Community's R&D activities. It comprises three parts: evaluation of social impact, communication with the public and analysis of public demand and new requirements.

Funding & Timescale

The programme was adopted in April 1992 and runs until the end of 1994. The programme originally had a total budget of 57 MECU, divided into 50 MECU for the Research - Industry interface, 4 MECU for the Research - Scientific Community interface and 3 MECU for the Research - Society interface. This amount has now been supplemented by an additional 9 MECU from the recently agreed top-up to the third Framework Programme.

Participation

The services of the Relay Centres and the information held in the CORDIS databases and the published documents are available to everyone. See page EC R&D 28 for contact details.

Assistance with utilisation, protection and promotion of results is available only to contractors who are or who have been participants in EC R&D projects and to their licensees or exploitation partners, including those of the Community Joint Research Centre. Participants can be industrial companies (in particular SMEs), universities, and public or private research centres in any of the member countries.

In addition, the Commission makes use of contractors to assist it in various activities, for instance designing and producing promotional literature and publications on Community R&D activities, carrying out surveys and studies in the European R&D community, and organising events and workshops on dissemination and exploitation themes.

A proposal usually starts informally with a simple letter or phone call to VALUE officials in the European Commission. At this, and at the later stages, all matters discussed are treated as

confidential. After further discussions, these ideas may evolve into proposals for action which are then formally evaluated and selected by the Commission.

Action follows in the form of study and services contracts, which are carried out on behalf of the Commission, and shared cost contracts. In shared cost contracts, the Commission's contribution will cover up to 50% of total costs. Universities and other research centres will have the option of requesting either 50% of total costs or 100% of additional marginal costs.

Management of the Programme

Management of the programme is the responsibility of the European Commission and a Management Committee composed of representatives from each Member State.

Status Report

The Programme was formally adopted by the Council of Ministers in April 1992.

The Relay Centres were set up in January 1993.

In September 1992, there was a call for proposals under the 'utilisation of results' line of action, aimed at the exploitation of results from EC R&D projects. This call was open-ended so proposals can be submitted at any time.

In September 1992, there was an announcement of opportunities addressed to small and medium sized enterprises (SMEs), intended to facilitate the access of SMEs to the results of EC R&D projects. Again, the announcement was open-ended so proposals can be submitted at any time.

Contacts

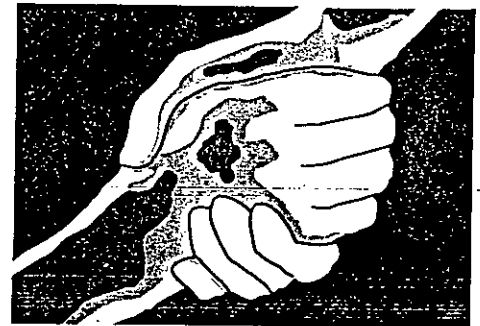
UK

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UK Relay Centres and CORDIS



UK Relay Centre Enquiry Lines

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Main Avenue
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Relay Centre for Northern Ireland

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Industrial Research and Technology Unit
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Relay Centre for Southern and Central England

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Relay Centre for Scotland and Northern England

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EC R&D28

Highlands and Islands of Scotland:

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Fax: (0463) 715 600

Central, Southern and North East Scotland:

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Fax: 041-339 8787

Northern England:

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The Community Research and Development Information Service (CORDIS)

The objective of the CORDIS information service is to disseminate public information on the Framework programme and all European Community RTD Activities and their results. It aims to enhance awareness of these activities, assist interactions and co-operation among individual programmes and their participants, and help promote co-operation with similar RTD activities in Member States.

ONLINE SERVICE

At present the CORDIS databases are available online in English on the ECHO Host in Luxembourg. From the UK they can be accessed in a number of ways:

- Using the national psdn network (the most popular way to connect from the UK)
- Direct dialling via the international telephone network
- Via the academic network JANET

The databases can be searched via a menu system or with an interrogation language, the Common Command Language (CCL). A full set of user manuals is provided to all registered users and this is complemented by a Help Desk service available during office hours via ECHO's free-phone number (see below).

At present the online service is available free of charge to individuals or organisations based in EC or EFTA countries, but users must register in order to obtain a personal password. To register as a CORDIS user, and for any other enquiries, contact the CORDIS Help Desk at the address given below.
CD-ROM

During 1993 a CD-ROM will be launched, containing complete CORDIS data. The CD-ROM is designed as an alternative to the online service for those who either have difficulties with online access or prefer to consult the database at leisure using a PC.

WINDOWS INTERFACE

A Windows Interface to the online system is also under development to provide a more user-friendly environment.

CORDIS CONTENT

The CORDIS databases currently available (at time of publication) are:

RTD-Programmes:

This database is central to the CORDIS Service as it gives details of the Programmes through which the Commission pursues and finances Community policy on Research and Technological Development. It provides a starting point to which most of the information in the other databases can be related.

Detailed information of programmes includes objectives, implementation details, funding and timetables.

RTD-Projects:

The projects database contains more detailed information of activities within Community RTD Programmes, such as projects and studies. Information includes general details of projects, their timescales and participating organisations.

The database can be used to find out the extent of Community activities in specific RTD areas, or to find out the involvement of companies and institutions in Community research.

RTD-Publications (EABS):

Bibliographic details of over 50,000 publications, documents and reports arising from the above projects. In addition, the RTD-Publications database contains references to scientific and technical documents published by the Commission but which are not necessarily related to an RTD programme.

Many of the publication can be ordered through the online ordering facility.

RTD-Comdocuments:

Information on Commission communications to the Council and Parliament on RTD activities. This is a valuable source of advance information on proposed programmes.

RTD-Acronyms:

Explanation of the multitude of acronyms and abbreviations arising from Community RTD activities. These represent programmes, projects, organisations, databases, installations and other items, but exclude technical abbreviations of the type that may be found in textbooks or technical dictionaries.

RTD-News:

Launched in December 1991 to provide latest news on all aspects of Community RTD activities. The news coverage includes calls for tenders, calls for proposals, events, publications, Commission proposals, activities in preparation, Community legislation and policies affecting RTD matters, and the progress and results of RTD programmes. The database is updated daily and includes an option which allows the user to browse through the most recent items.

RTD-Results:

Information on results and prototypes arising from Community and other RTD research. The information comes from both public and private sector organisations, whether the research is funded nationally, internationally or independently. The database supports the Commission's aim to exploit the results of research by facilitating their commercialisation.

RTD-Partners:

Launched in January 1992 as a partner-search database containing profiles of organisations seeking partners for Community or other RTD programmes and projects. Additional information includes the type of research proposed and the type of partner sought. The database is open to contributions: organisations seeking partners for Community or other RTD research can use the CORDIS RTD-Partners database to publish details of their proposed research and the type of partner sought.

Further information on data contribution can be obtained from the CORDIS Help Desk (see below).

The following CORDIS database is planned:

RTD-Infopoints: Organisations in Member States providing assistance, nationally or regionally, in relation to Community RTD activities.

INFORMATION ON CORDIS

For all further information contact the CORDIS Help Desk:

UK Freephone: 0800 899256
Direct phone: 010-352 34981 240
Fax: 010-352 34981 248

E-Mailx400:

C=DE;

ADMD=DBP;

PRMD=GEONET;

S=CORDIS-HELPDESK

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