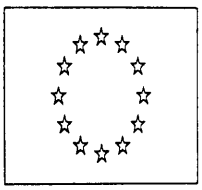

COMMISSION OF THE EUROPEAN COMMUNITIES

Brussels, 15.07.1998
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RESEARCH AND TECHNOLOGICAL DEVELOPMENT ACTIVITIES OF THE EUROPEAN UNION

1998 ANNUAL REPORT

(Presented by the Commission)

SUMMARY

This Annual Report of the Commission on research activities in 1997 provides an overview of developments regarding Community research policy and the implementation of research during the year. It aims to provide information which is of interest to researchers and research organisations, industrial enterprises, research policy specialists and politicians with an interest in the Community programmes, as well as to the European Parliament and Council of Ministers[1].

In order to take account of the progressive refinement of the data available on the implementation of Community research programmes, and to accommodate feedback on previous reports, in particular from the European Parliament and the Scientific and Technical Research Committee (CREST), the presentation of this latest Annual Report has been further modified in comparison with earlier years. To facilitate reference and comparisons, its overall structure nevertheless has been standardised. The report itself gives a synopsis of the main activities during 1997 (extending into 1998 in some areas where important actions or decisions were taken). Annex 1 gives more detailed information on the implementation of each of the specific programmes of the Fourth Framework Programme, and examples of projects supported. Annex 2 provides statistical information on contracts signed, on proposals and on funding. Annex 3 contains a list of complementary sources of information on Community Research (see note overleaf).

1997 was a pivotal year in the development of Community research policy. The Amsterdam Treaty modified the legal base for research which, when ratified, will eliminate the requirement for unanimous voting in Council, thus streamlining decision making and bringing research in line with other policy areas where a co-decision of EP and Council is required. Agenda 2000 – the Commission's strategy for addressing enlargement and the challenges of the future – also gave an important boost for research, emphasising the key role for knowledge-based policies. The Commission presented its formal proposals for the Fifth Framework Programme which represent a significant departure from earlier programmes in the direction of a more strategic, focused and integrated set of activities designed to further improve the impact of Community funding.

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Implementation of the Fourth Framework Programme continued at a similar level to 1996, with nearly 24000 proposals received and evaluated across all the specific programmes, 6000 contracts signed and ECU 3 000 million of Community funds attributed to research projects, involving 24000 participants. Cumulatively, more than 15000 research projects had been established under the Fourth Framework Programme by the end of 1997, amounting to ECU 8 200 million in signed contracts, with 10000 projects ongoing. Strong growth has been achieved in the level of participation of SMEs (24% of total participants in 1997 as compared to 18% in 1996) and the budgetary contribution they receive (16% of total budgetary contributions in 1997 against 13% in 1996), largely through the success of stimulation measures (cooperative research and exploratory awards) and take up actions (for information technologies).

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1 Article 130P of the EC Treaty and the Framework Programme Decisions (EC and Euratom) require the Commission to send a report each year to the European Parliament and Council.

The Fifth Framework Programme was again the main focus for policy developments during the year, with the presentation of the Commission's formal proposal in April 1997. The first reading of the proposal by the European Parliament took place in December 1997, followed by a modified proposal from the Commission in January 1998 and the Common Position of Council in March. The ground is thus prepared for a Decision on the Fifth Framework Programme and the specific programmes to implement it by the end of 1998, allowing continuity of funding to be maintained beyond the termination of the Fourth Framework Programme in 1998.

A decision was reached during the year 1997 on the Commission's proposal for supplementary funding of the Fourth Framework Programme, presented early in 1996. This resulted in an increase of funding of ECU 115 million for a number of specific research areas including transmissible spongiform encephalopathies (TSE). Concrete progress was also achieved in implementing the First Action Plan for Innovation in Europe, which includes a wide range of measures designed to improve the climate for innovation in Europe.

Considerable attention was given to programme management during the year, and into 1998. Besides the efforts towards progressive improvement of management performance and quality, significant advances were made in the evolution and further development of management systems to reflect fully the new principles of focus, coordination and flexibility in the implementation of the Fifth Framework Programme.

NOTE

Extensive information is available on EU research through regular complementary reports relating to different aspects of research activities. In addition to the present Report, which is issued annually, the following main types of documents are published by the European Commission which together provide a very comprehensive picture:

- *Annual Monitoring Reports*, for the Framework Programme and the Specific Programmes, which provide rapid, independent feedback on the state and quality of programme implementation.
- *Five-year Assessment Reports*, issued every fourth year, both for the Framework and the Specific Programmes, which present an independent retrospective evaluation on the relevance, efficiency, effectiveness, results and impact of the EU RTD programmes.
- *The European Report on Science and Technology Indicators*, the second edition of which was issued in December 1997 and which gives data and comparative analyses on European and national RTD in the world context.
- *Research and development: annual statistics*, a Eurostat report issued each year, which provides extensive data on Community and national R&D expenditures, R&D personnel and patents
- The Commission's main *annual budgetary documents* i.e. the preliminary draft budget, the budget and the consolidated revenue and expenditure account and balance sheet.
- Various *studies* and *analyses* conducted and published on the initiative of the research programmes and which address issues specific to the RTD domains they cover.

The main documents are listed in Annex III.

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CONTENTS

THE COMMUNITY'S RTD POLICY IN 1997 - 1998

The research and technological development (RTD) policy of the European Union aims to strengthen Europe's scientific and technological base and thus to contribute to the development of the competitiveness of European industry and to promote the quality of life of Europe's citizens. EU RTD policy complements Member States' national research efforts and supports other Union policies such as in agriculture, economic and social cohesion, transport, environment, health, education, energy, etc.

The European Union's RTD policy is implemented by means of specific research programmes which associate companies – including SMEs – universities and research centres from various European countries in joint research projects. The research themes covered by EU RTD are defined in multiannual Framework Programmes. The current Framework Programme (1994-1998) has a total budget of ECU 13 215 million: ECU 11 879 million for the Fourth EC Framework Programme and ECU 1 336 million for the Euratom Framework Programme (see Annex II, table 9).

The Joint Research Centre (JRC), with its seven institutes, is the Community's own research centre which contributes to the implementation of the Framework Programmes by carrying out research directly, and provides scientific support for other Union policies. A separate annual report of the JRC for 1997 is available (a brief summary is included in Annex 1).

1. NEW DEVELOPMENTS IN RESEARCH POLICY

1.1. THE CONTEXT OF RTD POLICY

1997 was a year in which the role of research within the overall political objectives of the Community was substantially advanced. Two major political developments of the year were the finalisation of the Amsterdam Treaty and Agenda 2000, the Commission's proposals for the future institutional and financial development of the Community. Both confirmed the need to attack major issues such as employment, competitiveness and sustainability, by further developing the Community as a society founded on knowledge, and to build a Europe which is closer to its citizens.

The Amsterdam treaty signalled a true maturity in research policy by removing the requirement in the co-decision process of unanimous voting in Council, thus bringing it in line with other policy areas, such as Single Market policy. This show of confidence in the European *acquis* should bring a more balanced debate and speed decision-making in the negotiation of future Framework Programmes.

Agenda 2000 provides a strategy for addressing the far-reaching changes - geopolitical, demographic, environmental, technological and economic - which Europe is facing, and which will open new political and economic horizons in the next century. Achieving sustainable growth and employment, within an inclusive society with a high quality of life requires dynamic enterprises and skilled and knowledgeable citizens. Thus knowledge policies - research, innovation, education and training - are of decisive importance, and must be properly resourced and effectively targeted to get the very best value for Europe

as a whole. Agenda 2000 recommends that, within a more constrained budgetary framework, the Fifth Framework Programme should be given a somewhat increased financial allocation above the level of the current programme.

1.2. PREPARATION OF THE FIFTH FRAMEWORK PROGRAMME

1997 was also a pivotal year in the development of research policy, with the Commission presenting its formal proposals for the Fifth Framework and rules for participation and dissemination (Article 130j Decision), as well as a working document on the detailed content of the Framework Programme. The ground is therefore prepared for the decisions which are needed before the end of 1998 to secure continuity of research funding in 1999. Proposals were put forward by the Commission in June 1998 for the specific programmes concerning the EC[2] and Euratom[3] Framework Programmes, and including the Joint Research Centre.

The FP5 proposal

The Commission presented its proposal for the Fifth Framework Programme in April 1997[4]. It represented a significant departure from earlier programmes, in line with the orientations given in earlier working documents, which were the subject of extensive consultation, and from which a general consensus emerged. Research was structured in six programmes - three thematic programmes and three horizontal programmes - and followed a highly targeted and integrated approach encompassing both EC and Euratom programmes, allowing significantly greater flexibility in implementation. The criteria for selecting research themes were set out and included social and economic relevance as well as high European added value.

The proposal predated the Commission's forecast of the economic outlook and its proposals for the development of the overall Community budget for the years 2000 and beyond. These were presented in July 1997, in the context of Agenda 2000, and a modified proposal was put forward at that time[5]. This proposal set out an overall budget corresponding to the political objectives and financial perspective given in Agenda 2000, and providing for an increase in funds, in comparison with FP4 to ECU 16 300 million, which represents a constant percentage of GDP plus 3%.

Parliament's first reading on 18 December 1997 supported the transition to a more strategic and focused Framework Programme, addressing major European concerns, and involving integrated research actions in a small number of large thematic programmes.

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2 COM (98) 305, adopted by the Commission on 10.06.1998.

3 COM (98) 306, adopted by the Commission on 10.06.1998.

4 Proposal for a European Parliament and Council Decision concerning the Fifth Framework Programme of the European Community for research, technological development and demonstration activities (1998-2002); Proposal for a Council Decision concerning the Fifth Framework Programme of the European Atomic Energy Community (Euratom) for research and training activities (1998-2002). COM(97) 142.

5 COM(97) 439 final, 11.08.1997.

This was also welcomed by the Economic and Social Committee[6], and the Committee of the Regions[7]. Parliament proposed an increase in the budget to ECU 16 700 million, and a number of changes to the structure, increasing the number of thematic programmes to four and bringing energy and environment research together in a separate programme. Changes were also made to the research content.

Following Parliament's first reading, the Commission modified its proposal in two major respects. In the first place it took up a number of Parliamentary amendments to the research content[8] that represented an improvement of the proposal. Second, it proposed moving to a structure involving four thematic programmes, thus responding to the substantive concerns of Parliament on the distribution of research activities but at the same time maintaining an integrated approach, focused on socio-economic objectives, which was consistent with the original political intent. The modified proposal, presented on 14 January 1998, retained the original budget of ECU 16 300 million.

Following a first examination of the proposal on 15 May and a more substantial debate on 10 November 1997, which benefited from CREST's advice on the scientific and technological content, the Research Council came to a common position, at its meeting on 12 February 1998, which was formally adopted on 23 March. This confirmed a four programme structure and developed the research content in a manner which, with a number of exceptions, was broadly convergent with the position of the Parliament and the Commission's modified proposal. However, it diverged considerably from the Commission's proposal in setting out an overall budget of ECU 14 000 million.[9], a figure which would fall well short of the allocation for the Fourth Framework Programme once account is taken of inflation. Council also proposed that the fourth thematic programme should give rise to two committees concerned with environment and energy respectively. The Commission expressed its serious reservation on these matters in its subsequent communication to Parliament.

Consultation on the S/T content of the Fifth Framework Programme

During the course of 1997, the detailed content of the new Framework Programme began to be filled out with the twin objective of meeting the political aims set out in the proposal and providing a package of research activities which corresponded to the proposed budget. Publication of the Framework Programme proposal followed a wide ranging

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6 CES 1407 de 1997, JO C73 09.03.1998 p.133.

7 CdR 158/97 fin, 17/18.09.1997.

8 Several additional key actions were proposed by Parliament, on chemical and molecular bases of life, health systems, taking account of ageing and the handicapped, global change and climate, social changes brought about by the introduction of new ICTs, and land and marine transport technologies. Moreover, Parliament proposed that the key action on advanced energy systems and services in the Commission's proposal be broken down into two key actions, dealing respectively with fossil and renewable energies.

9 To avoid anticipating a decision on the financial perspective for the years 2000+, the common position specified that this budget should be segmented into the years 1998-1999 and 2000-2002; the latter part being the subject of revision should it not be compatible with a future financial perspective, or should that financial perspective not be decided.

process of consultation and profited from a considerable effort of analysis, taking account also of the many productive outputs of the research/industry task forces.

Many contributions were received from the various players involved in European research. By the end of 1997 over 300 contributions had been received, including just under 150 from European associations and over 170 from private bodies ; among the latter 50 were from European industrial and professional federations. A conference on the scientific and technological content of the Fifth Framework Programme was held in February 1997, at which comments were provided by representatives of the research community, industry and users. This process of consultation was continued by a more in-depth review, in July 1997, of the prospective content of the specific programmes, again with the help of the constituencies concerned. Advice was also provided by the Scientific and Technical Research Committee (CREST) and by the Commission's advisory bodies IRDAC and ESTA (see section 2).

A working paper on the proposed content of the specific programmes was presented in November 1997[10]. Updated and modified in the light of comments received and developments in the programme structure signalled during the first readings by Parliament and Council, this forms the basis of the S/T content of the Commission's proposals on the specific programmes.

Preparations for implementation

Alongside the preparation and negotiation of the Framework Programme proposal and the development of its detailed content, the Commission commenced preparations for its implementation, these being of particular importance given the need to adapt to the new approach. These involved, in particular:

- The *rules for participation and dissemination*, on which the Commission adopted its formal proposal on 15 December 1997[11]. Consistent with their key role in the administration of the Framework Programme, they contain several innovations with respect to earlier programmes. For the first time a complete, coherent and transparent set of rules will be applied consistently across all the specific programmes, supplemented as required by a minimal number of specific rules adapted to each programme. The rules for dissemination and exploitation will normally vary accordingly to the rate of Community financing, reflected by the distance of the project to the market. A more flexible regime will apply to intellectual property rights, allowing the contractors to negotiate specific agreements, notably concerning exclusive rights, in compliance with the applicable rules on competition. This will be complemented by a more stringent monitoring of the commitment to exploit results, with a strengthened role of the technology implementation plan.

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10 COM(97) 553 final, 05.11.1997.

11 Proposal for a Council Decision concerning the rules for the participation of undertakings, research centres and universities and for the dissemination of research results for the implementation of the Fifth Framework Programme of the European Community (1998-2002); Proposal for a Council Decision concerning the rules for the participation of undertakings, research centres and universities and for the implementation of the Fifth Framework Programme of the European Atomic Energy Community (1998-2002); COM(97) 587, 15.12.1997. NB, in the case of the Euratom Framework Programme, the rules for dissemination are stated in the Euratom Treaty itself.

- Development of *practical arrangements for programme implementation* which are compatible with the new approach for FP5 and which provide for more general improvements in management efficiency, matters which were raised in successive research Councils. The new structure of FP5 will open the possibility of streamlining and improving the process of consultation with industry, the science base and users, through mechanisms which are consistently applied across the programme. The Commission's initial ideas on this matter were discussed informally with ministers' personal representatives towards the end of 1997. Work was also done to take forward the conclusions of the June 1996 seminar on management of research programmes in developing the operational aspects of the new Framework Programme (see also section 4).

1.3. IMPLEMENTATION OF THE FIRST ACTION PLAN FOR INNOVATION IN EUROPE

Work continued during 1997 in taking forward the objectives of the First Action Plan for Innovation, by putting into place a series of coordinated initiatives. Mobilising the various services concerned (Innovation, Internal Market, SMEs, Industry, Education and Training, Research and Development), the Commission's activities in this first phase focused mainly on 5 areas:

- ***Protection of intellectual property:*** on 24 June 1997 the Commission adopted a Green Paper on the Community patent and the patent system in Europe designed to launch a debate leading to practical proposals to simplify the patent system while making it more efficient and less expensive. To make those involved in innovation aware of what is at stake in the protection of intellectual property, the Commission is also setting up, under the Innovation Programme, an assistance and information service for participants in Community research programmes. Lastly, progress has been made with protecting innovations in rapidly expanding sectors such as biotechnology: with regard to biotechnological inventions, the Commission has put forward a revised draft Directive which was endorsed by the European Parliament and agreed upon by the November 1997 Internal Market Council.

- ***Innovation financing:*** particular attention was paid to the mobilisation of private capital for this purpose, in order to help Europe catch up in this area of fundamental importance to innovation. The Research Council of 10 November 1997 recognised the legitimacy of Community action in this connection, and the need for an approach under the Framework Programme allowing better account to be taken of aspects linked to research and competitiveness. In addition, the strong backing given by the Amsterdam and Luxembourg European Councils for innovation financing will allow considerable resources (EIB, EIF, Community budget) to be released for 1998 and 1999, thus enhancing Europe's capacity to provide equity finance for innovative high-tech businesses.[12] Other initiatives supplementing these measures include: investment forums for the various programmes; setting up of an assistance and guidance service and a performance benchmarking system at European level in the field of innovation financing.

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[12] The measures taken are intended mainly to channel capital (especially venture capital) more effectively towards innovative projects in their early stages. The I-TEC pilot project launched in 1997 under the Innovation Programme is helping to bring this about by enabling venture capital companies to acquire a lasting ability to assess and manage high-tech projects.

- ***The regulatory framework and administrative simplification***: apart from pursuing the SLIM (Simplified Legislation for the Internal Market) measures and promoting various forms of enterprise at European level (European company, EEIG, proposal for a statute for joint enterprises in research and development), the major initiative in this field is the setting up of the BEST task force with a mandate to formulate (for the Cardiff European Council in June 1998) specific proposals aimed at simplifying administrative procedures and improving the quality of legislation (both at Community level and in the Member States).

- ***Education and training:*** a major effort was devoted to training and education, in particular with measures to stimulate mobility ("Erasmus Apprenticeship", EUROPASS-Training, CAMPUS VOICE service) and to make better use of information technologies ("Learning in the information society" initiative), and pilot projects aimed at strengthening the innovation culture to complement projects to exploit research.

- ***Gearing research towards innovation:*** the preparation of the Fifth Framework Programme enabled this priority to be taken into account. The proposed Fifth Framework Programme is more focused (4 thematic programmes and 3 horizontal programmes) and explicitly includes innovation among the objectives of all the programmes. Within the thematic programmes, the "key actions" are aimed at fostering the emergence of targeted industrial applications. Lastly, the Commission has taken steps to ensure that the know-how and expertise of the Joint Research Centre are better exploited.

At the Employment Summit on 20 and 21 November 1997, the Heads of State and Government solemnly confirmed the need to promote research, innovation and the spirit of enterprise in order to help reduce unemployment in Europe. Continued implementation of the Action Plan for Innovation in 1998 will remain one of the Commission's priorities, in particular in the fields of intellectual property, access to financing, administrative simplification, and developing the spirit of enterprise.

2. OTHER MAIN ASPECTS OF COMMUNITY RESEARCH POLICY IN 1997 – 1998

2.1. FINANCIAL SUPPLEMENT FOR THE FOURTH FRAMEWORK PROGRAMME

Negotiations on the Commission's January 1996 proposal for a financial supplement to the Fourth Framework Programme continued throughout 1997, following a modified proposal presented by the Commission in November 1996 for a supplement of ECU 100 million. The common position of Council, reached on 27 January 1997 confirmed this sum, while the European Parliament, in its second reading on 13 March 1997, voted 5 amendments, increasing the supplement to ECU 200 million. Rejection of these amendments by Council resulted in the establishment of a conciliation committee which met twice, on 9 and 23 September.

The outcome of conciliation was agreement on a supplement of ECU 115 million, which was officially confirmed in a Decision of Parliament and Council in December 1997[13]. A significant proportion of the new funding is allocated to research on transmissible spongiform encephalopathies. The increase of ECU 15 million above the Commission's modified proposal (and Council common position) reflected an increase in the allocation to research on the detection and destruction of landmines, and the introduction of an additional theme on non-nuclear energy, in view of the Parliament's preferences.

2.2. CREST AND COORDINATION BETWEEN COMMUNITY POLICIES AND NATIONAL POLICIES:

In 1997 the activities of CREST (the Scientific and Technical Research Committee) were strongly influenced by the preparations for the Fifth Framework Programme, resulting in particular in opinions on various Commission papers related to this, for example the second working paper on the Fifth Framework Programme,[14] and the S/T content of the formal proposal on the Fifth Framework Programme.[15] These opinions indicated, among other things, that CREST shares the Commission's desire for a focusing of efforts and welcomes the concepts of key actions and generic technologies.

Other topics were discussed within the Committee, in particular the coordination of RTD policies and the assessment of Community RTD activities. In the latter connection, CREST endorsed the five-year evaluation and monitoring of the specific programmes and the Framework Programme, and the 1997 Annual Report.

With regard to coordination between Community policy and national RTD policies (Art. 130H), the Commission focused on the continuation of the exchange of information on national RTD activities within the *ad hoc* Committee set up in accordance with the Council conclusions of 9 June 1995. Other efforts related to indirect RTD support measures, research programming methods in Member States, and European partnerships within the national RTD programmes.

In its initial conclusions[16] on the exchange of information on national RTD activities, CREST stressed the importance of the work accomplished and the permanent nature of the exercise. At a seminar with the rapporteurs of the *ad hoc* Committees, organised by the Commission in October 1997, and to which representatives of IRDAC, ESTA and CREST were also invited, there was a fruitful exchange of experience and best practices. In the light of the results of this seminar, December 1997 CREST issued a second series of conclusions[17] outlining the strengths and weaknesses of the exercise. For example, it was recognised that the exchange of information results in better knowledge and mutual understanding of national RTD activities and is a good way of identifying areas in which

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13 Decision No 2535/97/EC of the European Parliament and of the Council of 1 December 1997 ; OJ L 347/1, 18.12.97.

14 (COM (97) 47 final; doc CREST/1202/97)

15 (COM (97) 142 final; doc CREST/1214/3/97 rev3)

16 (doc CREST/1206/97)

17 (doc CREST/1220/97)

coordination could be strengthened. However, this activity imposes a heavy burden on rapporteurs in terms of the communication of information on national activities (with problems of comparability), and does not always have a sufficiently high priority and profile.

To remedy these weaknesses, CREST and the Commission have specified the activities devolved to the *ad hoc* Committees, stressing that they must be clearly targeted on selected priority areas, and that a clear distinction must be established between what can be done by the Committees themselves, in particular by adapting the work programme, and what must be brought to the attention of CREST for its opinion and future action. The driving role of the rapporteurs and the need to give them increased support was stressed, as was the need to promote the circulation of the reports and work of the *ad hoc* Committees.

In the first half of 1998, the Commission will be holding a second workshop with the rapporteurs in order to continue the exchange of views and experience and ensure that appropriate account is taken of CREST's conclusions. The Commission will analyse the 1997 annual reports in order to identify the main messages emerging from the work of the *ad hoc* Committees and guidelines for the future, in particular the adaptation of the exercise in the context of the Fifth Framework Programme. In 1998, CREST's activities have continued to be influenced by the discussions on the Fifth Framework Programme. For example, at the beginning of the year the Committee considered the S/T content of the Commission's working paper on the specific programmes (COM(97)553), basing itself in particular on the work of the *ad hoc* workshops set up for this purpose, thus providing the Commission with a contribution that sheds light on the S/T content of the specific programmes. Other topics will also be addressed by the Committee in the course of 1998, e.g. the second European Report on S/T Indicators and international cooperation on RTD. The Committee's medium-term work programme will be updated.

2.3. ADVISORY COMMITTEES

Industrial Research and Development Advisory Committee (IRDAC)

The main topics addressed by IRDAC were the Fifth Framework Programme and innovation. IRDAC presented its opinion of the specific programmes under the Fifth Framework Programme to Mrs Cresson at the October 1997 plenary meeting, and started deliberations on the revision of the standard contract, with a view to the implementation of the new Framework Programme. The Committee issued a report concerning the participation and dissemination rules and will continue its activities in this connection, contributing to the preparation of the application rules and the standard contract. In addition, the Committee expressed its views on the structure of the programme, its budget and the composition of its consultative structures on a number of occasions.

IRDAC also expressed its views at length on the subject of innovation and the conditions needed to promote it. For example, the Committee presented its opinion on the Action Plan for Innovation and on the legal and regulative framework for RTD and innovation. Venture capital was the subject of two reports, one concerning the links between venture capital and the high-technology sector and the other, in preparation, analysing the measures taken by the Commission to ensure the provision of venture capital for Community RTD projects.

Three other IRDAC reports were noteworthy: the opinion on the Agreement for Cooperation on Science and Technology between the EU and the United States, the proposal for a European system of industrial host fellowships in the context of the Fifth Framework Programme, and the opinion on the management of Community RTD programmes. IRDAC plans to organise round tables on State aid for RTD, the use of "outsourcing" by European industry, and, last but not least, the Committee's annual seminar will concern the contribution of RTD and innovation to competitiveness and employment. The latter topic was addressed from the point of view of SMEs by Commissioner Papoutsis at the last meeting.

European Science and Technology Assembly (ESTA)

ESTA actively contributed to the debate on Fifth Framework Programme during 1997 at the same time undergoing a transition from an Assembly of approximately 100 members to a smaller body of 64 which saw the election of a new ESTA chairman and a new, smaller Bureau. Separate reports were produced in early 1997 on each of the three thematic priority topics put forward in the Commission's Working Paper, "Inventing Tomorrow". These reports offered strategic input on the development and implementation of the programmes, in advance of the formal proposals. They were complemented by a series of meetings between small groups of ESTA members and research Directors to discuss specific programme details.

ESTA also provided input for the development of the horizontal programmes, organising a round table on International Cooperation and addressing a number of issues in the area of "Improving Human Potential", such as research infrastructure, centres of excellence and research training networks. An exploratory round-table, bringing together experts from the main European academic organisations, was also organised to explore the contribution social scientists could make to the achievement of EU goals in research and related fields.

Longer-term recommendations were developed for Fifth Framework Programme at the March 1998 ESTA Plenary meeting, in four areas, each of which will be considered for further ESTA action[18]: support to research infrastructure; international co-operation in science and technology with Central and Eastern European countries; the link between the Fifth Framework Programme and the Innovation Action Plan with a focus on hi-tech SMEs; the attractiveness of regions, critical mass and competitiveness.

ESTA provided further encouragement to the development of entrepreneurial culture in universities in its report on "Academic and Industrial Research Co-operation in Europe" and carried out a study on the "Strengths and Weaknesses in European Science", jointly with the main national research councils.

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[18] The new ESTA Bureau developed a work plan for 1998 on the basis of which ESTA activities have been structured into four areas: i) ESTA projects related to the development of advice on RTD activities undertaken by the Commission; ii) longer term projects undertaken at ESTA's own initiative; iii) actions to maintain constructive relationships with the main European and international RTD organisations; iv) contributing to the promotion of a scientific and technological culture in Europe and the stimulation of debate at European level.

Outlook for the structure of IRDAC and ESTA

One essential aspect of the implementation of the Fifth Framework Programme lies in the greater involvement of those concerned with Community research on its management. Work has been done to develop new ways for consultative structures to achieve this. In particular, the Commission intends that ESTA and IRDAC should be transferred into a single "two chamber" body, giving advice for the Framework Programme and Community research policy as a whole. The renewed ESTA/IRDAC will entertain links with the External Advisory Groups, which will be established to act as channels of advice and communication on the focus and implementation of the Framework Programme between the Commission and the various parties concerned (researchers, industrialists, users) in relation to the key actions.

2.4. ECONOMIC AND SOCIAL COHESION

1997 was an important year for coordination between RTD and innovation policy and the structural policies on account of the preparations for the Fifth Framework Programme and the reform of the Structural Funds. Analyses relating to the new communication "Reinforcing cohesion and competitiveness through research, technological development and innovation"[19] made it possible to increase knowledge of this matter and promoted the mutual exchange of expertise within the Commission's services and hence the coordination process.

Coordination between RTD and innovation policy and cohesion policy was given a boost by the guidelines set out in Agenda 2000, which places particular emphasis on economic and social cohesion and on knowledge-related policies, as well as the European Spatial Development Perspective (ESDP) approved by the informal Council of Ministers responsible for regional planning in Noordwijk in June 1997, which stresses the importance of access to knowledge throughout the territories of the European Union.

With regard to the Structural Funds, studies carried out in preparation for the "Second European Report on S&T Indicators" confirmed the growing trend towards RTD in the Community Support Frameworks and the Single Programming Documents in the case of Objectives 1, 2 and 5b. The percentage of RTD and innovation related measures for the periods 1989-93 and 1994-99 increased from 2.92% to 5.37% (Objective 1); from 11.50% to 16.80% (Objective 2); and from 1.43% to 2.06% (Objective 5b) respectively. However, the total funds allocated to RTD and innovation related operations has remained more or less stable, amounting to ECU 8 518 million for the period 1994-99, or 5.6% of the amounts available. A more precise evaluation, involving qualitative aspects, has been initiated on the role of RTD and innovation in the Structural Funds from 1994 to 1999, based on the mid-term evaluation of the structural instruments in that period (intermediate results will be available in mid-1998).

It has been shown[20] at the same time that a catching-up process is under way in most of the less-favoured regions (Objective 1). Where the Framework Programmes are

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19 COM (98) 275; 27.05.1998.

20 Second European Report on S&T Indicators 1997, EUR 17639.

concerned, these regions have in fact done better than in the past, given that the financial participation rates were 8.95% and 8.77% for the Fourth and Third Framework Programmes respectively, which is slightly higher than these regions' share in research personnel. In 1997, the number of participations of Objective 1 regions was 12.6%, and the Community contribution for projects involving at least one participant from an Objective 1 region was 47% (52% for the first activity).

Action under the Framework Programme therefore supplemented that under the Structural Funds in terms of improving research capacities in the less-favoured regions, by enabling researchers from these regions to participate in high-level international research projects and slot into networks. For example, in 1997 alone, 13 463 collaboration links were created between the cohesion countries (Ireland, Portugal, Spain and Greece) and the other European Union countries, out of a total of 56 478 (23.8% of the links created).

In addition, each of the four areas of activity of the Fourth Framework Programme (1994-98) contributed in 1997 to economic and social cohesion in various ways, ranging from participation in programmes of particular interest to these regions (environment, socio-economic research, etc.), international cooperation, promotion of innovation and dissemination of results, to access to programmes concerning the training and mobility of researchers.

The Innovation Programme (dissemination and optimisation of research results) continued to play a key role developing cohesion aspects of the Framework Programme. The close cooperation with the Structural Funds has continued, supporting 40 new regions in their endeavour to define a Regional Innovation and Technology Transfer Strategy (RITTS). A large proportion of these projects are located in LFRs, which, through a pan-European network allows access to collective expertise and good practice. The network of Innovation Relay Centres has actively promoted the transnational flow of technologies toward LFRs, where the industrial fabric presents problems of dispersion or insufficient local infrastructure for addressing technological requirements. Innovation awareness activities have proven to be effective for the transfer of know-how from Nordic countries' cultures to LFRs. For instance in 1997, half of the 20 workshops conducted in European cities in the field of urban ecology took place in LFRs. Finally, more than 20% of the 74 partners selected after the third call for Technology Transfer Projects (in 65 projects), are from Objective 1, 2 or 6 regions (the cohesion dimension was included in the selection criteria).

While assigning greater importance to the dissemination and exploitation of results, the Fifth Framework Programme[21] will focus on the resolution of a limited number of socio-economic problems thanks to a new instrument to be known as key actions, some of which are of particular interest to the less-favoured regions: "Sustainable management and quality of water", "Sustainable agriculture, fisheries and forestry, including integrated development of rural areas", "Systems and services for the citizen", "Sustainable mobility and intermodality" and "The city of tomorrow and cultural heritage".

The Commission organised mobilisation seminars in order to continue its work on raising the awareness of those concerned, at national, regional or local level by economic

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21 Proposal for a European Parliament and Council Decision concerning the Fifth Framework Programme of the European Community for research, technological development and demonstration activities (1998- 2002), COM(97) 142 of 30 April 1997.

development, RTD and innovation problems.[22] The series of seminars begun in 1994 finished in March 1998 in Denmark. It should make it possible to ensure by the year 2000 a more rapid and more effective integration of the RTD and innovation dimension in the next Structural Fund period 2000-2006.

With the prospect of future enlargement, in 1997 the Commission launched a study[23] to measure Eastern Europe's technology gap. This study provides the basis for reflecting on the need for structural and operational support for RTD and innovation systems in the accession candidate countries. The conclusions of this study were presented in Vienna in November 1997.

2.5. INTERNATIONAL COOPERATION

In the context of the globalisation of knowledge and economies, the enlargement of the Union, the ongoing development of S&T relations with the emerging economies, and in the context of the Fifth Framework Programme, the Council of 14/15 May 1997 stressed the growing importance of RTD cooperation. This cooperation, entailing in particular a "European added value", helps to ensure a higher profile in the world for European know-how in the field of science and technology compared with the United States and Japan in particular. It also promotes economic and trade links, while helping to improve the competitiveness of the Union's economy and to implement other sectoral and external policies.

The activities conducted in 1997 were part of the medium-term strategy set out in the communication on the perspectives for international cooperation.[24] Efforts continued to increase the participation of the *accession candidate countries* in the second activity "international cooperation" and the other specific programmes under the Fourth Framework Programme, with the support of the second activity. A "structured dialogue" meeting (14 May) was held between the Research Ministers of the applicant countries and the Union countries, during which it was agreed in particular to step up the dialogue on RTD policy and explore ways, including financial ones, of facilitating these countries' participation in the Fifth Framework Programme.

Turning to the *advanced countries*, a Cooperation Agreement on S&T was signed between the EU and the United States of America, following on from the Transatlantic Action Plan signed in December 1995. It is designed to encourage and facilitate the development of scientific cooperation in areas of common interest. Negotiations began with Russia with a view to a Cooperation Agreement aimed at expanding and consolidating the present collaboration between Russia and the EU, presupposing, among other things, a solution for problems connected with taxation and the protection of intellectual property rights.

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22 "Science and Technology – optimising the impact in the regions", Liverpool (UK), 18.04.1997. "Stimulation of Research and Technological Development via the Structural Funds," Groningen (NL), 20.06.1997. "RTD policies, regional policies and structural policies," Metz (FR), 21.11.1997.

23 "Impact of the enlargement of the European Community towards the Associated Central and Eastern European Countries on RTD-innovation and structural policies", Coopers & Lybrand, 09.03.1998.

24 COM (95) 489 final, 18.10.1995.

The European Parliament adopted a resolution on the communication on promoting RTD cooperation with the world's *emerging economies*, which sets out vis-à-vis these countries, which are both the EU's partners and its competitors, a selective cooperation policy based in particular on the conclusion of Cooperation Agreements.

Where the *developing countries* (DCs) are concerned, following the conference co-organised by the Dutch Presidency and the Commission on partnership for research (Leiden, March 1997), the Commission published a communication on "scientific and technological research - a strategic part of the European Union's development cooperation with the DCs"[25] which was endorsed by the Development Council in a resolution adopted on 5 June. The general objective is to utilise RTD as a determining factor for sustainable development and for facilitating the integration of developing countries in the global economy. This strategy is based on four main principles: partnership, differentiation, mainstreaming of RTD, and an integrated approach to solving problems which combines institutional development, strengthening research capacities and international scientific and technological cooperation. Coherence between RTD and external policy will be ensured through coordination of the two instruments available - scientific and technological cooperation (through the INCO-DC programme) and official development assistance programmes. More active coordination with the Member States should further strengthen the impact of RTD in all the areas of development co-operation, on the basis of a global partnership with the developing countries.

Continued participation of the EFTA EEA countries (Norway, Iceland, Liechtenstein) in the Fourth Framework Programme has been enabled via an extension to the EEA Agreement and has worked satisfactorily. Where the other international cooperation forums are concerned, the meeting of the COST Ministerial Conference (June 1997) confirmed the interest of the Member States and the Commission in this intergovernmental initiative to coordinate European research. Detailed discussions were started between the Commission's services and representatives of Eureka on the procedures for greater interaction between Eureka, COST and the Framework Programme, with a view to encouraging the optimum utilisation of the results of European research.

3. RESEARCH ACTIVITIES IN 1997 AND IMPLEMENTATION OF THE FRAMEWORK PROGRAMMES

The Union's RTD policy mobilises a growing number of Union researchers and it supports or encourages European networks of undisputed quality; it plays an important role in all Community activities.[26] Networks involve firms, universities and research centres on a transnational basis in an increasingly wide variety of ways: for the first three years of the Fourth Framework Programme the respective share of firms, universities and research centres was 43%, 28% and 23% of total European participation in shared-cost actions[27] for the first activity of the Fourth Framework Programme.

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25 COM (97) 174, 25.04.1997.

26 Almost ECU 3 000 million and some 4% of the Community budget (see Tables 10 and 11).

27 For 1995, 1996 and 1997, the data are those given in Table 5 of the 1996, 1997 and 1998 Article 130P reports for European Union participants: the "others" category amounts to 6%.

3.1. IMPACTS AND SCIENTIFIC AND TECHNICAL RESULTS

In the course of 1997, numerous results were achieved through Community RTD projects which will contribute, sometimes indirectly and/or in the long term, to improving the quality of life in Europe: sequencing of the genome of several living organisms, development of a powerful climate-forecasting model for Europe, development of several innovative production technologies, launching of an international campaign to study the depletion of the ozone layer above Europe, etc.

However, the impact of the Community programmes also helps, in a more diffuse but equally important way, to support Europe's scientific, technical and industrial fabric. For example, Community funding has made it possible to establish hundreds of networks and conferences and has given rise to thousands of publications and patents - activities which help to promote the dynamism of European science and technology.

Where the economic impact of Community activities is concerned, an important aspect of the value added by the Community programmes is the coordination of research. In many areas Europe is at the forefront of science and technology – for example in certain branches of environmental, biotechnology and energy research - thanks to the coordination of research made possible by the European programmes, coordination which does not exist - or which exists to a lesser extent - in the case of some of our competitors. The pooling of data and expertise is another aspect of this European added value, making it possible to speed up the development of treatments in the medical field, for example:

- our understanding of certain forms of cancer has improved significantly as a result of studies carried out in parallel in several Member States and funded by the Biomedicine and Health Programme;

- it was also an epidemiological monitoring network supported by the European Union which detected the first ten atypical cases of Creutzfeldt-Jakob Disease suspected of being linked to "mad cow" disease.

The fact is that because Community projects are selected on the basis of their quality, most European research teams are consistently at the forefront of research in their particular sector. To quote just one example, a network under the TMR Programme made it possible to discover the quantum teleportation phenomenon, offering the prospect of new generations of computers.

However, these interesting scientific and technical results should not conceal the fact that the Union's major weakness lies not in its research potential but rather in translating the results of this research in economic and commercial terms. One of the objectives of the Framework Programme is therefore to improve this state of affairs and, through the Innovation Programme and the other specific programmes, to establish a framework conducive to innovation in Europe. Thus, following on from those initiatives, in particular by DG XIII-D, in 1997 ESPRIT established an annual Investment Forum designed to bring together IT firms and investors in innovation. Other similar initiatives have been launched elsewhere, in particular in the field of biotechnology (first conference of the "Biotechnology and Finance Forum").

3.2. MONITORING OF THE FRAMEWORK PROGRAMMES

As forseen in the relevant legal Decisions, the implementation of each of the 18 specific programmes and the Framework Programme overall were the subject of an independent monitoring exercise by panels of experts from the Member States; for the year 1997 all of these were completed by the end of March 1998.

The Framework Programme monitoring panel consisted of 8 senior experts, under the Chairmanship of Prof. J. Viana Baptista, Vice Chairman of IRDAC. As this monitoring exercise was conducted during the period when discussions on the Fifth Framework Programme were in progress, the Panel's deliberations took particular account of the approach forseen for the next Framework Programme and the actions in 1997 which are precursors to this new approach.

The Panel commended the significant improvements already effected by the Commission services in several areas of Programme management, and the Commission's efforts in responding to earlier monitoring exercises. It concluded that, overall, the Framework Programme is developing in a positive way and substantial results have been achieved in specific fields. Improvements were noted in processing proposals, supply of information to applicants, reduction of over-subscription, management flexibility and coordination and cooperation between programmes. The Panel highlighted a number of areas to which further attention should be given; in particular for the long term development of the programme, such as the development of a comprehensive concept of European added value, to assist programme definition/proposal selection and underpin output measures and impact assessment techniques.

3.3. CONTRACTS SIGNED AND PAYMENTS MADE IN 1997: ANNUAL BASIS AND FRAMEWORK PROGRAMMES

The statistical and budgetary data (see Annex II, Tables 1 to 3B and 5 to 7) relate to the contracts signed in 1997 and the projects in progress under all the Framework Programmes. The data relate to the Community and Euratom Framework Programmes; the financing structures for the Fourth Framework Programme include the financial supplement approved in 1997 (Tables 9 to 11). The calls for proposals (Tables 4 and 8) concern 1997 and 1998.

For 1997, Tables 1-8 indicate that nearly 24 000 proposals were received by the Commission in response to calls for proposals and that over 7 000 contracts and amendments to contracts were signed, corresponding to nearly ECU 3 000 million[28] and nearly 24 000 participations. On 31 December 1997 over 11 000 projects were in progress, including 10 500 under the Fourth Framework Programmes alone.

The 6 300 contracts signed in 1997 comprise on average 3.8 participations and 2.6 Member States and correspond to average funding of ECU 0.41 million (Table 2), which is slightly less than in previous years: this can be explained by the growing success of the

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[28] The commitments for 1997 for appropriations for operations amount to ECU 3 149 million, a figure which is more than the contracts signed in 1997. Generally speaking, the difference between commitments and contracts is attributable to contracts committed one year and signed by all the contractors the next year.

technology stimulation measures for SMEs and the accompanying measures which rose from 9.5% of the amount of contracts signed in 1996 to 13.6% in 1997. Concerted actions represented 6.9% of participations in 1997.

In the case of shared-cost actions (SCA), in 1997 as in 1996 over 4 000 projects were signed, giving rise to 18 000 participations. Taking into account amendments (which apply almost exclusively to SCA), since the start of the Fourth Framework Programme nearly 9 700 contracts have been signed, corresponding to ECU 7 100 million and over 46 500 participations. An average project (SCA) therefore involves ECU 0.73 million, 4.8 partners and 3.2 Member States.

In accordance with the revenue and expenditure accounts, all the appropriations for Community research operations (including the competitive scientific and technical support activities[29]) are accounted for in terms of payments in Table 1, totalling ECU 2 487 million under the Third Framework Programme (Table 3A), and ECU 2 188 million under the Fourth Framework Programmes (Table 3B).

Table 9 gives the breakdown of funding, including the financial supplement, for the various specific programmes for all the budgetary commitments concerning the Framework Programmes comprising management costs and direct actions (JRC) as well as the appropriations for operations. Tables 10 and 11 set out the budgetary commitments (1984-1998) for the Community research Framework Programmes in current prices and 1992 prices.[30]

3.4. IMPLEMENTATION OF THE FRAMEWORK PROGRAMMES AND OBJECTIVES OF EUROPEAN RESEARCH POLICY

3.4.1. INDUSTRIAL PARTICIPATION

After levelling off in 1995 and 1996, industrial participation in the Framework Programme as a whole increased in 1997, mainly as a result of SME participation. Aggregated data for the first three years of the Fourth Framework Programme show that for the first activity firms accounted for 43% of European Union participation (18% for large firms and 25% for SMEs) in SCA, and 44% of the Community contribution.

Industrial participation varies quite considerably from one specific programme to another (see Tables 5A and 5B). In 1997 the five programmes where industrial participation is around 50% include the two biggest programmes under the Fourth Framework Programme, "Information Technologies" and "Industrial and Materials Technologies" (16% and 22% of SCA respectively); large firms play the leading role (Table 5B). SMEs play a major role compared with the large firms in the case of the third activity "Dissemination and Optimisation of Results" (accounting for over 46% of the types of organisations), in the case of transport where they are more numerous than large firms, and in the case of non-nuclear energy.

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29 In 1997 as in 1996 these are accounted for in terms of payment. Qualitative and quantitative information concerning them is given in Annex 1 to this report on page 48.

30 The current financial perspective was decided upon in 1992 at the Edinburgh Summit for the period 1992-1999).

3.4.2. TECHNOLOGY STIMULATION MEASURES FOR SME ACCESS TO RTD

The percentage participation of SMEs in all the specific programmes increased between 1995 and 1997, bringing it to a level which, according to a recent report, is the highest of all public national or international RTD programmes.[31] SMEs now account for 24% of total participation (Table 5B).

The most important result in terms of SME participation[32] undoubtedly concerns the increase in SMEs with research facilities participating in collaborative research projects. Nearly 5 400 SMEs were funded in a project of this type between 1995 and 1998 – more than double the number in the previous framework programme.

Between 1995 and 1997, the technology stimulation measures for SMEs (TSME) thus enabled 2 900 SMEs to benefit from one of the 1 264 exploratory awards financed and nearly 1 900 other SMEs to participate in one of the 300 CRAFT projects in progress.[33] Over 80% of the SMEs receiving an exploratory award had never before taken part in a Community project.

A recent study[34] has confirmed that the latter point applies to the entire Fourth Framework Programme: 64% of SMEs interviewed are taking part for the first time, while in the case of 63% of them it is also their first participation in a public RTD programme (regional, national or international). The study shows that the Framework Programme enables SMEs to establish new contacts, 50% of them never having collaborated with any of the partners involved in the projects financed by the Framework Programme. In addition, the fact of obtaining an exploratory award increased the rate of selection of projects submitted by SMEs in 1995 and 1996: from 28 to 41% for collaborative research projects. In the case of CRAFT projects, the increase is lower (from 47 to 49%), but in this case the awards enabled a new category of SMEs to participate in the Framework Programme.

With an average of six or seven SMEs per CRAFT project, it can be estimated that the calls scheduled for 1998 will bring total participation under the Fourth Framework Programme to around 12 500 SMEs compared with 5 400 for the previous Framework Programme. On the basis of the study and these estimates, it is likely that under the Fourth Framework Programme nearly 8 000 SMEs will have participated not only in their first

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31 "Second European Report on S&T indicators - 1997", EUR 17639, December 1997.

32 The 9 300 SMEs obtained by adding up those indicated in Table 5 for the years 1995 to 1997 break down into 5 400 SMEs collaborating with other types of participants (large firms, research centres, universities) in research contracts and 3 900 SMEs benefiting from technology stimulation measures.

33 The 9 300 SME participations obtained by adding up the figures in Table 5 for the years 1995 to 1997 only represent organisations which have signed a contract with the Commission. Associated contractors such as, for example, the 1 700 SMEs that are co-beneficiaries of an exploratory award do not appear. Similarly, very many SMEs benefit from Community RTD programmes as subcontractors, without the Commission being able to quantify their participation or the funding received by them..

34 "SME Participation in the 4th RTD Framework Programme of the European Union", publication in preparation.

international research project but also their first public RTD programme (including over 5 000 as a result of the TSME).

3.4.3. CONTRIBUTION OF COMMUNITY RESEARCH TO THE DEVELOPMENT OF THE EUROPEAN ECONOMY

The Framework Programme makes an active contribution to industrial competitiveness, growth and employment as a result of the production of high-quality knowledge. The latter is essential to the development of the Union's productive capacity and is a precondition for the availability of human resources capable of meeting new needs. In addition to its direct impact on employment,[35], the Framework Programme increases the dynamism and productive capacity of the research community by supplementing the research efforts at national and regional level (subsidiarity principle). In particular, as a result of the numerous links that it establishes between the various players involved (since the beginning of the Fourth Framework Programme, 160 000 collaboration links between EU partners have been created, of which nearly 60 000 in 1997), it helps to consolidate the European dimension which is becoming an increasingly essential aspect of growth and employment. In this connection, mention should also be made of the Training and Mobility of Researchers Programme.

A study completed in 1998 on completed projects under the Brite-EuRam Programme has indicated that firms' participation in Community research has major economic implications: nearly half of all the firms involved have managed to increase their turnover; 40% of them have gained access to new markets; and 40% have been able to increase the size of their workforce. Another study concerning a series of projects under the Esprit Programme[36] has also shown that 1 ecu invested in research results ECU 11 of economic output eight year later.

Thanks to the Training and Mobility of Researchers Programme several thousands of young scientists have been able to obtain training in a country other than their own and have been able to expedite their research by having more rapid access to relevant and recognised results. For example, by the time it ends the current programme will have made it possible to support the training through research of 6 500 researchers/year in the context of the "networks" activity and some 5 600 researchers/year in the case of the Marie Curie fellowships. The "large facilities" activity of the programme has made it possible to facilitate the access of European researchers to very expensive large facilities in order to carry out certain research work. This activity is particularly important for researchers working in the regions of the Community that are the furthest away from such facilities. The Association of Marie Curie Fellows set up in 1997 and its branches in all the Member States also represent an important channel of dialogue and source of information and assistance for Marie Curie fellowship holders during and after their fellowship.

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35 By involving over 24 000 firms, universities and research centres in over 6 000 projects in 1997, the Framework Programme provided employment for a considerable number of people working in the field of S&T.

36 "Pilot Evaluation of Economic Effects, HPCN - ESPRIT", Office for Official Publications of the European Communities, 1997.

The Commission has lengthy experience with the evaluation of RTD programmes, but in particular because of the difficulties of evaluating the socio-economic impact of RTD it has begun to reflect on how to improve evaluation methodologies by attempting to increase their ability to measure the output of programmes.

4. MANAGEMENT OF RESEARCH

In the context of the debate on the Commission's proposal for the Fifth Framework Programme and the lead-up to proposals for the specific programmes, management was a subject of considerable attention during the year and into 1998. Besides the ongoing issue of progressive improvement of management performance and quality, significant advances were made in the evolution and further development of management systems to reflect fully the new principles of focus, coordination and flexibility in the implementation of the Fifth Framework Programme.

Following a suggestion to the Council of research ministers at its meeting on 15 May 1997 from Mrs Cresson, the Commissioner responsible for research, a group of personal representatives of research ministers was set up and met three times during the year. The group was set up with the aim that the Commission should "...provide on an *ad-hoc* basis ... more detailed information on the modalities of programme implementation and management ...".

In its three meetings, the group discussed the principal issues related to programme implementation within EU RTD programmes. These meetings provided for the possibility of constructive discussions between the Commission and the Member States, allowing concerns to be aired, issues to be clarified and overall principles for programme management to be confirmed. In particular, the discussions focused around the issues of transparency, the role of programme Committees in the more strategically-oriented Fifth Framework Programme, the networks of providers of information and assistance to proposers, and the Commission's external advisory structures. A representative of the Commission chaired the group and the Chairman's report on the main findings of the group was a major input for the Council conclusions on the implementation and management of Community RTD programmes adopted at the 10 November 1997 meeting of research ministers.

Ministers affirmed the need for a closer liaison with the research, industry and user communities in the implementation of the Fifth Framework Programme and the need to adapt management structures to improve flexibility. Their conclusions opened the way, following the political agreement on a Common Position reached at the February research Council, to a further discussion in the context of an informal ministerial colloquium held in London on 28 April 1998, focusing specifically on management aspects of SME participation and training/mobility fellowships, as well as general management issues.

At the informal colloquium, the Commission put forward a series of proposals for adaptations to the management system applying to the Fifth Framework Programme, including:

- A regular "benchmarking" exercise to compare the performance of the Commission with that of other research organisations (a first such exercise carried out by independent consultants in early 1998 concluded that the Commission's administrative costs compared favourably with those of both member states' and other European research organisations).

- The setting of targets for the timescales of key steps in the process leading from project proposals to research contracts.

- Guidelines for the setting up of external "Advisory Groups", to act as consultative bodies for the Commission on the priorities for research work and as an instrument for transparency, providing channels for communication between the Commission and the various parties involved (researchers, industrialists, users).

- A pilot experiment of "host fellowships" for Marie Curie research training fellowships, in which the Commission would be responsible for selection of the host institutions, which would themselves handle the selection of fellows on the basis of criteria established by the Commission (and subject to Commission confirmation).

- Arrangements to improve the management of SME-specific measures, building on the achievements in the Fourth Framework Programme, including the setting up of a renewed and reinforced network of information and assistance, and the creation of a single entry point for SMEs, covering all the programmes of the Fifth Framework Programme.

The Commission also confirmed its interest in the possibility of strategic research initiatives within the Fifth Framework Programme which, through voluntary efforts on the part of researchers, would involve grouping ("clustering") projects around particular objectives, with greater autonomy for the project coordinators and simplification of administration, whilst giving those involved access to a larger, and closely coordinated, RTD activity.

On more detailed aspects of management, as reported in the last Annual Report, the Commission has set up an inter-service group to examine all the steps involved in the implementation of the programmes and, in particular, any changes that will need to be made in the context of the Fifth Framework Programme. With the Commission's proposals for the structure of the Fifth Framework Programme decided, the group continued to work throughout 1997 and, towards the end of the year, set up a number of specialist sub-groups to examine particular issues in much more detail. These groups are continuing to work and cover all the major topics relating to programme management, including internal Commission procedures and delegation, contractual issues, proposal evaluation procedures and evaluation manuals, harmonisation and simplification of documentation (including forms, information packages, etc.), information and assistance networks, project monitoring and evaluation, statistics and informatics systems for the management of the Fifth Framework Programme (including electronic proposal submission).

ANNEX I

RTD ACTIVITIES IN 1997 AND WORK PROGRAMME FOR 1998

1ST ACTIVITY OF THE FOURTH FRAMEWORK PROGRAMME AND THE EURATOM FRAMEWORK PROGRAMME

INFORMATION AND COMMUNICATIONS TECHNOLOGIES

1. TELEMATICS APPLICATIONS

Activities in 1997

The Telematics Applications Programme is a user-driven research programme, focusing on the applications of information and/or communications technologies to society, thus providing some of the building blocks for Europe's Information Society. Its activities are relevant to a range of other European policies in fields such as transport, health, education. At the end of 1997 the Telematics Applications Programme was responsible for a total of some 500 projects, of which more than 450 were shared-cost projects.

In the course of the year, contracts were signed following three calls for proposals: the fourth general call generated 179 new projects, of which 140 were shared-cost projects; the call concerning Integrated Applications for Digital Sites (IADS) generated 21 new contracts, of which 11 were shared-cost projects; the joint call for Educational Multimedia (EMM) involved 6 programmes (Telematics Applications, ESPRIT, Targeted Socio-economic Research, TEN-Telecom, Leonardo da Vinci and Socrates) and generated 29 new projects, of which 25 were shared-cost projects. The fifth call for proposals for the "Research networks" sector resulted in one new shared-cost project to be signed in 1998. A joint call for proposals was launched in December 1997 by the Transport Programme together with the "Telematics Applications for Transport" sector.

The time between the closing date for the call and the signature of most of the contracts was brought down to five open months (seven months in 1996). This significant improvement has been achieved through a combination of a robust evaluation process and the use of a two-stage proposal process involving pre-proposals and full proposals. The 1997 calls have also seen a reduction in the "over-subscription" of the budget compared to previous years. There has also been a tendency to select larger projects (in particular, the IADS activity encompasses projects worth an average EC contribution of ECU 4.5 million, which reflects the cross-sectoral nature of this initiative).

For the second annual technical review of projects, 261 independent experts got together to carry out a technical audit of 355 projects, 30 of which were subject to an in-depth audit.

The annual monitoring report stressed the improvements in the efficiency and transparency of programme management during 1997, the consistency of project selection with the initial objectives and the work programme, the relevance of dissemination activities, and the consideration given to output indicators that are appropriate for individual sectors.

Examples of results

100 000 severely mobility-impaired Europeans will get a better quality of life and get more independence through development by the FOCUS project of a standardised way to equip wheelchairs with different assistive devices. The TESTLAB project, which provides access for blind and visually-impaired readers to library catalogues and to documents, demonstrated its services at 25 test sites in 1997.

The monitoring of air quality is essential for human health and well-being. An efficient telematic environment management system has been developed by the EMMA project to provide 24/48-hour air pollution forecasts so that traffic restrictions or other measures can be taken to reduce risks.

Contribution to Community RTD objectives

The programme covers the whole range of RTD activities from applied research to real-site demonstration. By developing systems components and specific services, and integrating them into generic platforms, this programme helps to satisfy society's needs in areas of general interest, contributes to the competitiveness of the industries and services concerned, and helps to implement other relevant European Union policies. In 1997 projects selected from the first two calls entered into their demonstration phase which will give preliminary indications on the tangible impact of the results on significant socio-economic objectives such as employment, market stimulation or cohesion.

A prototype of a "safe" car which can monitor the state of the driver and take corrective action if necessary has been developed by the SAVE project. This has the potential to reduce the number of road accidents by up to 30%. More accident victims are going to be saved following the development by the HECTOR project of a telematic communication system linking the accident site via an ambulance directly to the intensive care units, so that first aid can be guided directly by the expert consultants.

Contribution to strengthening industry's S&T bases and developing European competitiveness

The results of the projects take the form of prototypes of telematics systems and services, incorporating various equipment, algorithms and software tools, to provide potential users with innovative technical solutions meeting their needs and expectations. The programme reinforces the technological bases of the European industry (35% of the number of participants), thus enabling hardware, software and service companies to increase their competitiveness on the emerging applications and multimedia service markets. Increased structuring of the various user communities and quicker uptake of RTD results are dramatically enhanced through the involvement of the users in all phases of the project cycle.

An important innovation in the programme in 1997 was the launch of 11 large-scale demonstration projects for Integrated Applications for Digital Sites. These projects will design, implement, test and evaluate cooperative digital platforms in order to support and further deploy a wide range of multi-language and cross-sectoral services. The projects aim at providing one-point access to a wide range of public and private services and thereby boost the industry's ability to provide relevant services for the information society of the 21st century.

The police forces and emergency services all over Europe can now more efficiently combat cross-border crime and fraud through a multi-lingual communication system developed by the LINGUANET project which provides simple forms of translation where appropriate. Many instances of practical results are reported such as recovery of stolen vehicles, foiling of abductions and drugs related interceptions.

Contribution to other Community policies

In 1997, most projects in the Telematics Applications Programme went into their demonstration phases on real sites with large numbers of users. The projects will thus have a direct influence on the shaping of the information society and the optimisation of the European model of society.

The joint call for educational multimedia directly supports the educational policies of the Community as described in the White Paper on Education, by developing multimedia services providing equal access to high quality education regardless of where the pupils are living. In addition, the projects in the Libraries sector provide new ways of opening up access to the vast stores of knowledge traditionally held in libraries, museums and galleries.

Employment policies are supported by the combined projects' efforts, as new services are being developed to prototype stage, and new

employment possibilities are being created. Employment policies are being supported directly by projects in the Administrations and Education & Training sectors which support teleworking and better information to the unemployed and to employers.

The projects in the Health and Disabled and Ageing sectors are directly contributing to policies concerning the quality of life for citizens. Projects are now demonstrating applications which will give a better quality of life for people living in remote areas, by providing access to distance diagnostic services; development of smart cards for health records will make travelling safer and easier for citizens.

In the Transport sector, the projects concern all modes of transport (road, rail, air, waterborne and multimodal) and have begun to demonstrate the potential of telematics applications to improve deteriorating transport conditions by increasing network efficiency, enhancing traveller safety and reducing environmental impacts. Policies towards a better environment are supported by the applications developed in the Environment sector for better monitoring of the environment, and pollution forecasts, be it in air, water or soil.

The barriers between people speaking different languages or those between man and machine are being progressively overcome thanks to Language Engineering and Information Engineering. Activities in these fields provide systems that can be applied in a broad range of business and societal applications for addressing complex issues such as multi-lingual software and service interfaces, human-computer interaction, technology mediated inter-personal communication, ease of access, usability and multimedia information content.

A very flexible and powerful platform developed by the COOPWWW project has been adopted as their infrastructure for cooperative group working by an increasing number of European research projects and by prestigious Europe-wide users such as regional development and employment policy-makers. A collection of interoperable tools and services has been assembled and integrated with an upgraded version of the so-called BSCW kernel which has already been installed in over 200 Web sites around the world.

Work programme for 1998

In 1998 the programme's activities will be strongly directed towards dissemination and uptake of the results of the projects. A first effort in this direction will be a major conference and exhibition in February in Barcelona promoting the first results of the projects and highlighting their contribution to the information society. This will be followed by sector-specific conferences in the year and a set of publications and dissemination of results on the WWW promoting the results of the programme.

2. ADVANCED COMMUNICATIONS TECHNOLOGIES AND SERVICES (ACTS)

Activities in 1997

Examples of results

The ACTS programme is now fully implemented. As a result of the third and last call for proposals of 1997, the decision has been taken to support a further 89 projects which reinforces work in key strategic areas, such as high-speed Internet services, advanced optical communications and 'agent' technology developments which will make it easier to find information.

Advanced optical multi-wavelength communication networks will provide the infrastructure for the explosive growth in Internet services and data communications.

Interoperation and standardisation have always been strong themes within EU communications RTD. In 1997, the consolidation of cooperation on development of common guidelines for advanced infrastructure and service deployment further strengthened Europe's lead in key areas. Work in the ACTS programme also supported wider consensus development in the areas of electronic commerce, multi-media access to cultural heritage, and new working methods.

The critical review of each project in an annual technical audit has also again proved a valuable way of allowing projects to re-orient work in a rapidly changing technical and regulatory environment, as well as of ensuring a high level of European 'added value' for public investment.

Contribution to Community RTD objectives

Strengthening Europe's science and technology base

As a result of a decade of cooperation in technology developments, in conjunction with agreements on common specifications and standards, European industry has a strong base and leads world developments in a number of key areas. All the major European telecommunications network operators, the equipment manufacturers, the leading broadcasters and cable TV operators collaborate in the ACTS programme. In 1997, their joint work involved over a thousand other companies and universities, and attracted partnerships with organisations in 23 other countries outside the EU.

The agreement on common specifications for the Universal Mobile Telecommunications System (UMTS) will enable rapid and coherent market development in Europe and elsewhere.

Development of European competitiveness

In 1997, the first evaluation of benefit from participation in the ACTS programme showed that more than half of the projects have already improved the world competitive position of the partners. Participation in the EU RTD is also seen to contribute to faster product and service development (over 400 new systems and components are now emerging), reduced investment risks, and more focused business strategies. Over 1300 technical papers have already been published, over 345 contributions have been made to standardisation bodies, and over 40 new patents have been registered.

A major achievement of ACTS cooperation has already been realised with the unanimous industrial agreement on specifications for the next generation of multi-media mobile communications: the UMTS system. This agreement arose from the long and careful analyses in RACE and ACTS projects, and will give European industries a head start in product

and service developments, and European citizens the confidence in transborder use and the longer-term value of new investments.

Similarly important achievements have also been reached in common digital video/TV standards and in image coding - also now widely used on the Internet.

Digital television and Internet video services will open up new opportunities for European creativity, with a single set of technical standards underpinning rapid market deployment.

Stimulation of growth and employment

The telecommunications and broadcasting sectors continued to grow at over 8% per year in 1997, well above the level in the economy as a whole. In addition, wider use of new communications systems contributes to growth and employment in the economy as a whole. ACTS RTD contributes directly to new forms of secure electronic commerce and to widening employment opportunities by allowing new ways to work, particularly various forms of teleworking. These developments are now at the centre of European and national strategies for employment and small business innovation.

The link between *sustainable* growth and the emergence of an information society was strengthened in 1997 through initiatives in the Information Society Forum and the ACTS programme. A group of 16 projects have combined their efforts to promote the use of new communications systems for sustainability through common guidelines.

New ways to work and electronic commerce offer new opportunities for millions of Europeans and small businesses. Over 500 major trials are being supported through ACTS projects in 1998.

In the area of electronic commerce, the common guidelines for interoperability and consumer protection published in 1998 build directly on cooperation within the ACTS programme framework. This agreement will further strengthen the single market and will stimulate faster take-up of new business practices by SMEs, with consequential benefits for employment.

Work programme for 1998

A major technical audit of all ACTS projects has already been carried out in late January 1998. This clears the way for both re-orientation of some work and for launching the new projects selected following the call for proposals in 1997. Commitments of budget resources will therefore be completed by mid-'98, and the focus of effort will then be on maximising benefits of the results, and in ensuring a smooth transition to the information society part of the Fifth Framework Programme.

Cooperation with organisations in Central and Eastern Europe will be substantially strengthened with the new projects in 1998. In addition, science and technology agreements with Israel and the USA will underpin growing cooperation with major companies in these countries.

3. INFORMATION TECHNOLOGIES (ESPRIT)

Examples of results

ESPRIT fostered progress on two fronts - RTD and use of information technologies (IT) - and continued to contribute towards making all European industry more competitive. The accent was placed on involving users and suppliers at an early stage, while the choice of activities was dictated by the prospects for industrial application. Accompanying measures are an integral part of the RTD projects, the principal objective being to promote the take-up of IT in a wide variety of sectors.

Electricity consumption by the key components of portable telephones has been reduced to one-fifth. Use of a multi-chip module, in turn, has allowed further big reductions in weight, size and thickness.

Activities in 1997

Three new calls for proposals were published, based on a work programme updated annually with the twin objectives of taking account of the latest data on technological and industrial changes and of introducing a new thematic approach. This provides a means of overcoming the degree of fragmentation caused by a field-by-field approach and of focusing on finding answers to key issues such as electronic commerce, mobility, access to information and interfaces, apprenticeship and training in industry. Joint calls for proposals were also published, in conjunction with the industrial and materials technologies programme: one on intelligent manufacturing systems (an area also covered by international cooperation), the other on aeronautics. Finally, the ACTS and ESPRIT calls for proposals each allocated ECU 10 million to subjects related to satellite communications. These activities and the follow-up work on subjects such as intellectual property rights (IPR) and the Web ensured close coordination between the programmes concerned.

Technological breakthroughs on large dimensions and high brightness have been achieved for flat active liquid crystal matrix displays and will be applied in television for professional use and the general public, for both front and rear projection.

Estimates put the proportion of new participants at around 30%. For the programme as a whole, the success rate over the period 1994 to 1997 for all procedures combined was around 20%.

SMEs (around 85% of them employing fewer than 100 staff) are involved in 75% of the projects. They receive 25% of the total funding and represent 34% of all participations. Big companies receive 41% and make up 28% of the participations. Partnerships between small firms (suppliers) and big companies (users) are common. The number of exploratory awards is also increasing gradually and totalled 85 by the end of 1997.

Considerable progress has been made with electronic signatures, confidentiality systems and cryptography. This greater security is the key to the success of electronic commerce. The results obtained from several projects are now being **marketed** in the USA, amongst other places.

At the end of 1997 some 2% of the ESPRIT projects involved an organisation from a non-EU country. Nine of the twelve projects started on intelligent manufacturing systems included an EU organisation. Finally, 53 new INCO projects on IT started in 1997, of which 33 were with Central and Eastern European countries and the New Independent States and 12 with Mediterranean countries.

The PROSOMA multimedia database supplements the sectoral dissemination and information activities. It contains the results of 280 ESPRIT projects but more are being added constantly and it should fill up considerably in the course of 1998. It is accessible on-line (http://www.cordis.lu/esprit/home.html). CD-ROMs are released regularly and publications are distributed at events such as the annual conference (EITC-97).

The principal recommendations made in the five-yearly evaluation of the programme and during the annual monitoring are to bring together the ITC programmes in a single programme, to speed up the time to market the results, for example by shortening the projects from an average of 25 months today to 18 months, to fund projects by infant companies, to develop a common view of RTD and market trends and, finally, to simplify and speed up the administrative procedures and make them more flexible.

Contribution to Community RTD objectives

Strengthening Europe's science and technology base and industrial competitiveness

ESPRIT provides companies in Europe with the means to acquire the technological know-how essential in order to achieve the highest competitiveness, with the aid of cooperation between some 4 210 companies and 2 200 research centres and university teams. It supports important RTD activities in essential fields such as technologies for components and subsystems, software technologies, high-performance computing, on-board systems, multi-site and network applications, technologies for business processes and electronic commerce, multimedia systems, microprocessors, integration in manufacturing and long-term research.

ESPRIT is open to all industries. Users account for around 60% of the industrial participation, a sure sign that the programme is spreading throughout the economic fabric. By way of example, microelectronic components and microprocessors now account for 20% of the value of electronic systems - a world market which will be worth an estimated US$ 1 160 billion by the year 2000. In many sectors it is vital for undertakings to have the capacity to incorporate the know-how specific to their products in silicon-based components combining hardware and software functions. ESPRIT can also have a strong potential impact on industrial competitiveness and employment. One study showed that 80% of the 400 projects analysed ended in industrial application within five years of completion. Another on a limited but representative sample of projects on high-performance computing (HPCN) showed a ratio of over 8 between direct effects and Community funding and of over 2.4 for the indirect effects. It is widely recognised that ESPRIT plays a decisive role in progress in all IT in Europe.

By encouraging first experimental use of microelectronics (FUSE), best software practice (ESSI), integration in manufacturing (IiM) and, more generally, take-up of IT in all the fields covered, ESPRIT provides firms from all sectors, particularly SMEs, with tangible means of increasing their industrial competitiveness.

High-performance computing has substantially improved the efficiency of on-line visual inspection systems, for example in the steel or textiles industry, and for sorting and routing mail. Germany's young entrepreneurs' prize went to a participant in ESPRIT for an automated system for sorting coffee beans and other fruit, which is now exported to several countries.

A post-production multimedia system for conversion of all recording formats was launched on the market in March 1998. It seems to be in a class of its own at the moment. It has won several international prizes already.

An intelligent robot system for automatic paving and brick-laying is being used at various sites in Europe, where it has brought considerable productivity and quality gains.

Contribution to other Community policies

ESPRIT contributes to completion of the single market on several fronts: with regard to general intellectual property and copyright issues, the specific nature of software and IT issues has been taken into account effectively and transparently. Looking ahead to the year 2000, a recent communication discussed smooth operation of transfrontier infrastructure, particularly for telecommunications, transport, energy and financial services. As for conversion to the euro, procedures have been established to identify common problems and to provide a channel for exchanging information on best practice.

ESPRIT has helped to increase cohesion, thanks to 521 participations by organisations from objective 1 regions between 1995 and 1997, giving them access to over half the work carried out under this programme.

ESPRIT not only organises numerous advanced training schemes on essential subjects ranging from microelectronics to software technologies but also helps to ensure wider Internet use in schools, for example in the form of "Netd@ys". It is supporting the establishment of a European network for schools (Schoolnet) and the rural world and a pilot project on an IT knowledge passport aiming at a target population of 100 000 persons from 13 countries and extending to Eastern European countries.

Several other ESPRIT projects are focusing on various environmental applications of IT: for effective crisis management (for fires, floods, etc.), appropriate treatment of water in the event of accidents causing pollution, various issues relating to energy saving, pollution control, etc.

Finally, ESPRIT plays a role in humanitarian action, by allocating around ECU 15 million to the development of effective methods for detecting anti-personnel mines.

Work programme for 1998

The 11th and final call for proposals was published in March 1998. It covers three areas in the programme (TCS, HPCN and IiM) and has a budget of ECU 32.4 million. The annual conference/exhibition on the programme will be extended to the other ICT programmes and will be held outside Brussels for the first time - in Vienna from 30 November to 2 December 1998 under the title "IST '98 Vienna". As in 1997, it will be transmitted to several countries by satellite and will provide a setting for special events such as the Investment Forum and the presentation of the ITEA prizes. A large proportion of the activities in 1998 will be devoted to preparing the information society programme under the Fifth Framework Programme.

A rethink of the chain between fishermen, wholesalers and retailers has led to the development of an electronic system, using IT and satellite communications, for selling catches from the fishing boat, revolutionising fishing and distribution conditions. The same system can be applied to other activities.

The TEN 34 project (in collaboration with the Telematics and ACTS programmes) has established 34 Mbyte interconnections between the national research networks for researchers from all disciplines. Upgrades to 155 Mbytes are now being studied.

Automatic lip-reading, combined with voice recognition, has resulted in commercial applications for dubbing of actors and teaching foreign languages.

4. INDUSTRIAL AND MATERIALS TECHNOLOGIES (IMT)

Activities in 1997

The main activity in 1997 was implementation and management of the calls for proposals for RTD projects, of the thematic networks and of the CRAFT projects and negotiation of the projects recommended for Community funding. The number of proposals received in 1997 was up on the previous year to 1140 RTD projects, 156 thematic networks and 840 CRAFT projects (both types). The percentage accepted by the evaluators was also up to around 37%, 55% and 60%, with funding totalling around ECU 702 million, ECU 54 million and ECU 74.6 million respectively.

The efforts to stimulate basic research bore fruit and attracted an adequate response in terms of numbers and quality of proposals, easily attaining the target set (10% of the budget). A major milestone was also passed, with more than half the existing thematic networks set up in the course of 1997 alone.

The schemes started in 1996 to encourage SMEs to participate in CRAFT-type projects produced promising results, with the number of proposals up by 60% compared with 1996, the proportion rejected as ineligible down to under 15% and a selection rate of over 60%. These schemes continued in 1997.

ECU 11 million was committed to preparatory, accompanying and support measures, particularly conferences, training grants, support for SMEs and workshops and studies in preparation for the Fifth Framework Programme. The seventh conference on industrial technologies was held in Toulouse, where the central theme was European research at the service of citizens, focusing on three areas of industrial research with an impact on everyday life: the urban environment, the factory of the future and aeronautics - three topics at the heart of the Fifth Framework Programme.

In its 1997 report the monitoring panel found that the quality indicators used by the programme were an extremely useful tool for monitoring the performance and impact of projects. As regards take-up of results, the panel recommended placing greater emphasis on quantified application plans and economic forecasts during the research phase.

Contribution to Community RTD objectives

Objectives such as industrial competitiveness, economic growth, quality of life, environmental protection and industrial safety are an integral part of the programme. The multidisciplinary projects are carried out by partnerships bringing together suppliers, manufacturers, universities and users, thereby ensuring application of the results in as many industries and countries as possible.

Examples of results

Safety of high-speed trains is a constant concern. A partnership of rolling stock manufacturers, research centres and railway operators from four EU countries has designed a new type of wagon with low distortion of the passenger compartments. A new European safety standard was proposed.

An original application of laser beams provides a means of cleaning every nook and cranny of ancient monuments or other buildings. The laser beam, guided by optical fibres and set to the appropriate intensity, is capable of hitting precise small target zones and cleaning highly irregular surfaces. This innovation is fully compatible with the material cleaned and the environment and offers safer working conditions as well.

The 1997 evaluation of recently completed projects found that over three-quarters of the participants had fully attained their objectives in terms of strengthening industry's S&T base and that two-thirds considered the results of their projects ahead of the state of the art, in that they combined new scientific knowledge with technological developments.

The same study demonstrated that the majority of the projects had an economic impact and made the undertakings more competitive. In particular, almost half generate potential economic activity worth over ECU 5 million within five years of completion. To be more precise, this adds up to a total economic gain of over ECU 11 billion from all the industrial research projects selected during the current programme in return for Community funding totalling ECU 1.3 billion.

Almost two-thirds of the projects analysed in 1997 produced results likely to bring environmental benefits: energy savings, lower discharges of hazardous products, smaller amounts of materials used, etc. They also brought spin-offs for health and working conditions in areas such as user safety, quality of the working environment and use of less hazardous products.

The recent analysis of the projects completed showed that 36% offered potential for direct job creation by the partners responsible for application of the results. Only 10% could have adverse effects in this area. In all, by the end of the programme almost 500 industrial entities will be applying an implementation plan generating direct employment.

The projects in the IMT programme, some of them with budgets of over ECU 10 million, seek to attain the critical mass necessary in order to tackle strategic technologies (see boxes for examples) and to produce practical results, particularly in fields requiring highly intensive research. For example, the economic importance of the boom in air traffic forecast during the next ten years has unleashed fierce competition between European and US manufacturers. Technological progress is a key factor in this competition.

In 1997, the IMT programme granted 30 research projects in strategic fields for the European aviation industry Community support totalling ECU 85 million. Half focused exclusively on technologies relating to aircraft efficiency, one particularly competitive field of research. The vast majority of the European industrialists concerned are involved. Their own resources and the national funding for RTD in the aviation sector would not be enough for them to see this research through on their own.

A joint project between the chemical and tanning industries has produced a new clean process for treating pelts producing high-quality leather while at the same time cutting production costs. This project enables the industry to adapt to the increasingly severe Community rules on environmental protection while remaining competitive.

Nickel, particularly in jewellery and bracelets, is a prime cause of allergic reactions. In one CRAFT project, 15 jewellers and 6 research bodies have developed a technology to limit the adverse effects of nickel and new alloys causing no allergy to replace it. This keeps these firms' activities in tune with public demand for healthier products.

This example vividly illustrates the European added value which the programme can generate, particularly in fields of strategic importance for the EU economy.

Work programme for 1998

The evaluation process will concentrate on:

- the two joint calls for proposals published on 31 October 1997, one on water together with the Environment and Climate Programme, the other on concurrent engineering in aeronautics, together with the Information Technologies Programme;
- the call for proposals published on 15 April 1997, in conjunction with the Information Technologies Programme, under the Agreement on international cooperation in research and development in the domain of intelligent manufacturing systems, as approved by the Council on 27 January 1997;
- technological stimulation in favour of SMEs (CRAFT), thematic networks and accompanying measures: the closing date for this call for proposals is 20 May 1998.

Scientific monitoring of progress on the 823 RTD projects selected since 1995 will, of course, continue to be one of the main activities in 1998.

Preparation of activities under the Fifth Framework Programme will be another essential task. As last year, workshops and studies will be organised to contribute towards the preparations for the thematic programme on "Competitive and sustainable growth" under the next Framework Programme.

Some industrial processes are at the mercy of fluctuating raw material quality, yet the quality of the end product must remain the same. One project used artificial intelligence in timber and pulp production to predict the quality of the end product from data on the raw material and on progress with the production process. Industrial users' energy, water and starch consumption and the volume of waste generated have plunged as a result.

A new industrial process has sharply cut the cost of the chemicals used for recycling aluminium. The technology has been tested and should bring considerable economic benefits in the years ahead. The partners on this project are about to obtain a European patent.

5. MEASUREMENT AND TESTING

Activities in 1997

In 1997 over 300 proposals were evaluated, the majority on theme I in the programme - "measurements for quality European products" - and the targeted calls to support Community policies and European standardisation. A total of 145 projects received Commission funding totalling ECU 37 million in 1997.

The procedure was completed for the following calls for proposals:

RTD projects:
Under the second call for theme I in the programme, 104 proposals were evaluated, 47 of which were selected. So far 39 projects have received a Community contribution totalling ECU 22 million. In response to the fourth and fifth targeted calls, 62 proposals were received, 34 of which were selected. The Commission granted a total of ECU 8 million to 20 projects. Overall, at least one third of the partners in all these projects are from industry (50% SMEs).

Technology stimulation for SMEs/CRAFT:
There was a marked increase in the response from SMEs in 1997, with over twice as many proposals evaluated - 86 compared with 41 in 1996. The Commission granted 35 projects a total of over ECU 2 million.

Thematic networks and accompanying measures:
Under the continuously open call for proposals, funding totalling ECU 2 million was granted to 17 new networks and 34 accompanying measures received support totalling over ECU 2 million.

Contribution to Community RTD objectives

The programme has contributed to several major Community policy objectives. The research supported by the programme has a strong impact on industry, trade and society in general and the results are a prime means of protecting consumers, health, public safety and the environment, as illustrated by the examples described in the boxes and below.

Out of concern to improve the quality of suncreams on the world market, the European cosmetics industry has proposed a work programme to verify their efficacy against harmful ultraviolet radiation. The telecommunications industry in turn needs precise evaluation of the electromagnetic radiation emitted by portable telephones in order to define conditions ensuring greater reliability for users. These measures will make European industry more competitive by putting on the world market products inspected and labelled in accordance with recognised scientific methods. Turning to the measures to support standardisation, the results of a method for testing the performance of liquid solvents less harmful to the ozone layer, together with the establishment of the European network of police science laboratories, will incontestably generate Community added value, since all these measures concern key sectors for the European Union.

Examples of results

Acoustical thermometry: measurement of temperatures from 1000°C to 1500°C. This thermometer uses ceramics capable of withstanding high temperatures. It provides a means of calibrating other thermometers. Lively interest has been shown in this innovation in the USA, where there is nothing of the kind on the market. Work is under way to extend the range of the thermometer beyond 2000°C. At the same time this instrument is allowing decisive progress in manufacturing processes for ceramics (estimated market: ECU 5 million per year).

Measurement of carcinogenic polycyclic hydrocarbons in table oils calls for highly sophisticated methods of analysis, for which it is essential to develop reference materials in order to verify the validity of the measurements. One project has allowed certification of the first two materials in this field. Some 2000 inspection laboratories are potential users of these materials (estimated market: ECU 2 million per year).

The Commission further underlined the advantages of standardisation in a communication entitled "Research and standardisation" drafted in 1997 and adopted by the Commission on 27 January 1998 (COM(98) 31). The objective is to give greater consideration to the prenormative dimension at an early enough stage in the research and innovation programmes under the Fifth Framework Programme in order to make European industry more competitive and improve the quality of products and services to the benefit of consumers and citizens.

Work programme for 1998

The priority will be to make a start on the projects selected following the 1997 calls for proposals with a view to building up Europe's metrology infrastructure, primarily in the fields of chemistry and biology, and defining the measurements and tests which customs laboratories require for monitoring trade in goods, for confirming the origin of products and for cultural heritage and forensic medicine purposes.

Finally, to mark the 25th anniversary of the Community Bureau of References (BCR), a conference on measurements for tomorrow bringing together the leading players in the field of metrology from Europe and the rest of the world is planned in Brussels in November 1998.

Commitment appropriations totalling ECU 43 million are available in 1998, inter alia for funding the projects selected in response to the 1997 calls for proposals and the sixth targeted call. ECU 9 million is earmarked for cooperative research projects (CRAFT), ECU 3 million for the final package of thematic networks and ECU 2 million for accompanying measures.

Detection of steaming-up of goggles: The principal cause of eye injuries due to industrial accidents is the removal of goggles during dangerous work because they have steamed up on the inside. This project has developed a mini-camera capable of detecting the environmental conditions leading to steaming up. This method will supplement Directive 89/686/EEC relating to personal protective equipment. The project will help to reduce the number of accidents, which cost an estimated ECU 220 million every year.

New collector for measuring low gas flows

The margin of error in air pollution analyses is 25%, mainly due to unreliability on the part of the flowmeters. The Milogas project has developed a new instrument using a silicon collector manufactured with the aid of micromechanics. The principal applications are in medicine, air pollution analyses, mining, etc. The estimated market will be 10 000 instruments over the next 3 years at a unit cost of ECU 200. The research and production costs will total ECU 1 million.

6. ENVIRONMENT AND CLIMATE

Activities in 1997

Main programme implementation activities in 1997 related to the launch and evaluation of the final calls for proposals for the second phase of the programme (1997-1998). The second main call for proposals covering most areas of the programme, together with the call for the relaunch of the ENRICH initiative (European Network for Research in Global Change) ultimately led to the selection of 306 high quality proposals, involving an EU contribution of ECU 205 million, for funding in 1997 and the early part of 1998. However, there was a disappointing outcome in the number and quality of proposals submitted for the potential operational instruments theme of the space techniques area and ENRICH. Consequently, calls for these activities were reopened in the second half of 1997 and associated awareness campaigns succeeded in producing better quality proposals. A call for the Centre for Earth Observation (CEO) was also launched in the middle of 1997. These further space calls led to 32 RTD projects for an EU contribution of ECU 32 million being selected for funding in 1998 for CEO activities and pre-development of new space sensors in various domains such as forest fire or vegetation monitoring.

Core horizontal and support activities have continued to provide the vital underpinning for implementing the strategic objectives of the programme. The concerted campaign undertaken by the Commission services, with the assistance of national focal points, to make SMEs aware of the opportunities to participate in RTD at EU level has now started to produce significant, increased responses: as many exploratory and CRAFT awards were granted in 1997 under the technology stimulation measures as in the whole of the first phase of the programme (46 exploratory awards and 11 CRAFT awards have now been made available). Improving the human research potential, particularly through assuring an appropriately qualified environmental scientific community, has continued to be a focus of the programme, with financial support being provided in 1997 for a further 37 training grants (72 so far under the programme), 13 advanced study courses (22 in total under the programme) and a significant number of workshops, seminars and conferences organised or sponsored under the programme.

Introduced in 1997 were a new evaluation manual (made available in advance to proposers and aiming at greater transparency and objectivity), a pre-checking service for potential proposers, as well as the scrutiny by independent observers of the new evaluation procedures. The observers have been broadly supportive and positive towards the new evaluation manual, the process and its implementation.

Over 80% of all A-rated proposals and one out of every two high quality proposals (A and B-rated) have been funded since the programme started - overall 684 RTD projects and concerted actions have to date been evaluated positively for funding under the programme. But a specific

Examples of results

The PROVOST project forecasts global rainfall probability. The partners have been remarkably successful in producing six-month forecasts of El Niño and associated global impacts (e.g. dry and wet conditions).

In May, the first scientific conference of ELOISE (European Land Ocean Interaction Studies) assembled 150 scientists from 15 projects. IGBP - LOICZ is recognising ELOISE as the EU contribution to global change research in the coastal zone.

The first "European Conference on research for the protection of cultural heritage: Opportunities for European Enterprises" (Rome, December 1997), consolidated the European networks established under EU projects and contributed to reinforcing SME competitiveness in this area.

problem relates to ensuring that only good proposals addressing the targets and objectives of calls are submitted. Despite the detailed evaluation criteria set out in the new evaluation manual, the pre-checking offered by the Commission services, and encouraging potential proposers to auto-evaluate their proposals before submission, more than half of the proposals evaluated in 1997 did not pass the threshold for scientific and technical quality and project management. Considerable resources are devoted to proposal preparation and evaluation, and all involved in RTD, including European and national focal points, networks disseminating information on the programme and Member States, must discourage submission of lower quality proposals.

Floods have increased in Europe. A major concerted action RIBAMOD has defined best practices for flood plain management.

Contribution to Community RTD objectives

Contribution to the reinforcement of the S&T bases in industry and of competitiveness: many of the outputs of the programme have significant potential for subsequent application and development for global exploitation, especially in relation to environmental technologies and sustainable development. Pockets of high industrial participation are found in the areas perceived to be of more direct relevance to industry, such as environmental technologies and space where two-thirds of the projects selected for funding to date involve one industrialist or more, including one SME or more in about 44% of the projects. Almost a quarter of all the participants funded in these areas involve industrialists (13% SMEs).

For green accounting, an approach of an environmentally adjusted national product has been developed to orient statistical and empirical modelling for measuring future economic - environmental performance.

Contribution to other Community policies: ongoing activities under the programme and the organisation of a series of seminars provided key inputs to the Kyoto negotiations on the UN Convention on Climate Change and will continue to be a major basis in the preparation for the follow-up Buenos Aires conference, particularly on the tradable permits and "sinks" issues. The breadth of projects continues to provide the sound scientific basis needed for the development of environmental policies, the implementation of the Fifth Environmental Action Programme and the preparation of its follow-up. Work under the space techniques area of the programme will provide the platform in 1998 for identifying the information needs of the EU for future operational space missions, for the preparation of a Commission action plan for earth observation by satellite, and for developing a European policy (with Member States, ESA and EUMETSAT) and an integrated strategy (CEOS) for earth observation.

Satellite remote sensing is helping regional and national governments decide the limits of new nature reserves, and managers of established reserves to plan developments, by mapping land cover and monitoring the health of the vegetation in their areas. Europe is now placing itself as a major and highly experienced contender in projects of this kind throughout the world.

Work programme for 1998

The major activities in 1998 for the programme under the 4th Framework Programme will centre around the remaining open calls, in particular, relating to the supplementary funding of ECU 7 million decided by the Council and European Parliament on 1 December 1997 for activities relating to water, a further "tranche" for advanced study courses, the final selection round for the CRAFT awards for SMEs closing on 1 April 1998, and two further selection rounds for training grants.

Attention will also be given to management issues which have arisen in the existing programme or highlighted by annual monitoring panels.

Further efforts will be made to ensure that research results are made available, quickly and in an understandable way, to potential users ranging from policy-makers to the business, industrial and scientific communities.

The necessary instruments and tools will be developed for the smooth transition to the integrated and problem-solving approaches to be adopted for environmental activities proposed for the Fifth Framework Programme.

The VEGETATION 1 space instrument in which the EU has invested ECU 50 million was launched on SPOT 4 in March 1998 and the first data received from April 1998 onwards will be used for the benefit of EU policies.

Projects have shown how regulatory policies could be designed to promote cleaner technologies with both economic and environmental advantages over traditional strategies. They show how environmental sustainability objectives can be coupled with competitiveness.

7. MARINE SCIENCES AND TECHNOLOGIES

Activities in 1997

- In response to the second general call for proposals (closing date: 15 October 1996), work was started on an initial package of 34 RTD projects, 5 of them in research area A of the programme ("Marine science"). The largest project (OMEX-II, involving 33 laboratories from 10 European countries) is a multidisciplinary study into the margin between the continental shelf and the deep seas in the North-East Atlantic (see box). Eight of the 11 projects in research area B ("Strategic marine research") focus on management of coastal zones and studying typical physical phenomena there (sediment transport, wave patterns), while the other three are developing improved designs for various coastal protection structures (sea walls and breakwaters). Finally, area C ("Marine technology") was covered by 18 projects on such diverse subjects as communications and underwater acoustics, seafloor characteristics, measurement and sampling instrumentation (including a new core sampler for sediments), remotely operated underwater vehicles (ROVs) and also research to find bioindicators of the state of the marine environment.
- On 17 June 1997 a call for proposals was published to supplement activities under the predictive oceanography programme. In 1998 work will start on the projects selected.
- Five projects were started as the MAST programme's contribution to the ENRICH network, run jointly with the Environment and Climate and INCO programmes.
- Under this programme, 16 scholarships were granted and four advanced courses funded on ocean forecasting, the role of methane in the marine environment, the dynamics of the wave-breaking zone along rocky coasts, and living communities in the vicinity of deep-sea hydrothermal springs.
- A major international conference on recent advances in oceanographic research in the Mediterranean region was held in Rome from 17 to 19 November. A special session entitled "From oceanographic science to society" marked the start of a dialogue between naturalists and sociologists, two sides of a single system requiring a holistic approach. In January all the coordinators of the marine technology projects met in Aberdeen to discuss, with the Commission, scientific topics, project management and ways of improving dissemination of the results. The annual meeting on the ELOISE (European Land-Ocean Interaction Studies) programme was held in Arcachon in May.
- The 1997 monitoring report made recommendations for measuring the long-term impact of the projects. It also advocates continuing the approaches made to SMEs and greater focusing of the advanced training.

Examples of results

The ENAM (European North Atlantic Margin) project combines the efforts of 14 research bodies acting with the agreement of a partnership of oil companies operating off Norway. It is focusing, in particular, on identifying areas of the continental slope posing a risk of instability and should help the offshore industry with siting of operations.

The OMEX (Ocean Margin Exchange) project is studying and attempting to quantify exchanges of water and materials between the European continental shelf and the open seas of the North Atlantic. The CANIGO project in turn is looking into the region under the direct influence of the current from Gibraltar. A sound knowledge of these interactions and flows is necessary to evaluate the contribution made by the European margin and the Mediterrranean to the processes leading to global change.

Contribution to Community RTD objectives

- Work on the four major regional projects (MATER for the Mediterranean, BASYS for the Baltic, OMEX for the North-East Atlantic and CANIGO for the Canary Islands-Azores-Gibraltar region) continued. Both BASYS and MATER cover geographical areas with fragile ecosystems under extremely heavy pressure from human activities. They are therefore key projects for acquiring the scientific base for the Union's environment policy in the regions concerned.
- All the projects in progress reflect the European dimension of RTD in various ways: scale (in the case of regional projects), geographical complementarity of sites studied, opportunity to set up networks of laboratories on leading-edge subjects such as biodiversity and marine microbiology, the design of unmanned underwater vehicles and underwater laboratories, drilling techniques adapted to the increasing depth required for offshore oil exploration or, finally, marine biotechnologies.
- Six of the projects completed in 1997 concerned physical oceanography (currents, transport of materials and CO_2 absorption) in the North Sea and North Atlantic and seven were on coastal zones (impact of storms, restoration of beaches, breakwater design, mapping of seabed).
- The products emerging from this research in 1997 included several CD-ROMs containing data and final reports, a guide to electronic publication of project data and the development of a website on MAST.

The CHABADA (Changes of bacterial diversity and activity in eutrophied Mediterranean waters) project under the ELOISE programme on coastal ecosystems has demonstrated the adverse impact of pollutants on bacterial biodiversity and, hence, on the food chains in the seas concerned.

The GEOSTAR (Geophysical and oceanographic station for abyssal research) project aims at developing a prototype underwater observatory capable of long-term measurements of the principal geophysical and environmental parameters at depths of down to 4000 metres. It is conceived as the first link in a monitoring network for, in particular, earthquake prediction.

Work programme for 1998

- Start of the second package of projects selected after the second general call for proposals.
- Start of the projects selected following the 1997 calls for proposals on operational oceanography, supporting initiatives and ENRICH.
- Funding of a new set of scholarships and advanced courses and aid for small firms (exploratory awards and CRAFT projects).
- Drafting of work programmes on the key actions making up the marine sciences component of the Fifth Framework Programme.
- Organisation of the third European Conference on Marine Sciences and Technologies (former "MAST Conference") in May 1998.

The BENGAL project recently discovered abrupt and totally unexpected major changes in the fauna almost 5000 metres down in the Atlantic. The next question is whether they were due to natural causes or human activity.

8. BIOTECHNOLOGY

Activities in 1997

Objectives:

In 1997 the specific programme on biotechnology continued to pursue its original objectives: to understand the mechanisms which make the living cell so productive and to generate the knowledge needed for industrial progress in the areas targeted for Community intervention.

To concentrate on what distinguishes biotechnologies from other modern technologies, the programme focuses on the following research areas: the cell factory, genome analysis, plant and animal biotechnology, cell communication in neurosciences, immunology and generic vaccinology, structural biology, prenormative research, biodiversity and social acceptability, infrastructure and horizontal activities (demonstration activities; ethical, social and legal aspects; public perception; and socio-economic impact).

RTD projects:

Following the third call for proposals published on 15 June 1996, contracts were concluded to grant a total of ECU 113.5 million to 96 projects (eight of them demonstration projects) covering ten areas, including somatic gene therapy, immunological substances, in-vitro pharmaco-toxicology or biotechnology for the environment. The demonstration projects concerned prototype vaccines against malaria or HIV inter alia.

The fourth call for proposals issued on 17 June 1997 attracted 572 proposals which were evaluated by independent experts in November 1997. They included 75 proposals for demonstration projects. Biodiversity, biosafety, generic vaccinology, neurosciences, animal models, sequencing and cell factories were amongst the subjects covered.

A joint call for proposals on transmissible spongiform encephalopathies was launched on 29 April 1997, in conjunction with the two other life sciences programmes. From the 66 proposals evaluated in July 1997, a total of 22 proposals (seven of them on biotechnology) were selected under the three life sciences programmes and will receive a total of ECU 21.3 million. The biotechnology projects concern prion transmission and propagation, evaluation of the risk of transmission of bovine spongiform encephalopathy to man via contaminated food and the development of methods of diagnosis and of inactivation of the infectious agent causing transmissible spongiform encephalopathy in particular.

Technology stimulation measures for SMEs

In 1997, exploratory awards were granted to 35 proposals covering subjects such as somatic gene therapy to treat neurodegenerative diseases

Examples of results

1997 marked the end of the project on sequencing of the *Bacillus subtilis* genome. The decoding of the 4000 or so genes of this bacterium opens the way for numerous applications in the agri-food, pharmaceutical and detergents industries.

The COLDZYME project to explore the properties of microbes living in extremely cold environments has discovered and patented an enzyme active at low temperatures. This provides a means of cutting energy costs for processes in the food or pharmaceutical industries. One practical example would be a washing powder effective in the cold.

(Alzheimer's, Parkinson's or Huntington's diseases) or the synthesis of peptides for use as new immunosuppressive agents. The third and fourth calls for proposals in turn reflected the growing interest shown in biotechnologies by SMEs (which accounted for 40% of the proposers).

Research training grants

In 1997 a total of 133 research training grants were awarded. In addition, in April 1997 the biotechnology programme paid for 100 of these grantholders to participate in a meeting with representatives of the European industry to present the opportunities offered by the biotechnology sector in Europe.

Other accompanying measures

A workshop on the spirit of enterprise in biotechnology was organised under the biotechnology programme in June 1997. It brought together 100 or so participants from the world of academic research, the biotechnology industry, risk capital providers, business start-up agencies or science parks in Europe to address questions such as: Which sectors of biotechnology research are the most conducive to business start-ups? Which measures must be taken to encourage the spirit of enterprise? Which type of project is best suited to business start-ups? What can be done to improve interactions between the leading players in the development of biotechnology firms?

Following a call for proposals for training grants for practical courses in the field of biotechnology, published on 17 December 1996, one grant was awarded in 1997.

Scientific progress, combined with optimisation and standardisation of methods, enabled QIAGEN to place kits for the detection and evaluation of plant biodiversity on the market in 1997. Practical applications include verification of the origin of certain types of wood used in winemaking.

Contribution to Community RTD objectives

Biotechnology opens up numerous opportunities to improve the quality of life in sectors such as health care, chemical manufacture, agriculture and the environment. In the case of the environment, the knowledge acquired in fields such as microbial diversity or biosafety helps to answer the relevant ecological issues. One of the principal areas of activity is bioremediation of polluted compounds in the environment using genetically modified organisms.

Finally, the increase in industry's response to the third call (77%) indicates that the biotechnology programme is moving increasingly towards strengthening the science base, enabling industry to become more competitive at international level.

Gene therapy provides a means of making up for genetic deficiencies. One pioneering project on muscular dystrophy, for example Duchennes disease, holds out hope of treatment. This new approach uses bone marrow cells to compensate for the loss of muscle cells.

Work programme for 1998

A second joint call for proposals on transmissible spongiform encephalopathies was published on 17 March 1998 and will close on 17 June 1998.

All the contracts based on the fourth call and on the two joint calls on transmissible spongiform encephalopathies will be negotiated and concluded by the end of the year. A budget of around ECU 156 million will be set aside in 1998 for the RTD projects, research training grants and other accompanying measures. Finally, the first conference of the "Biotechnology and Finance Forum" is to held from 12 to 14 May 1998

9. BIOMEDICAL AND HEALTH RESEARCH (BIOMED)

Activities in 1997

Following the second call for proposals, 125 projects were funded for an amount of ECU 88 million.

The evaluation of the proposals received for the third (and final) call for proposals was organised in March 1997 and concerned: cancer research; cardiovascular research; chronic diseases, ageing and age-related diseases; occupational and environmental health; rare diseases; public health research; biomedical ethics; ethical, legal and social aspects; and demonstration projects.

From a total of 1002 proposals, 159 (approximately 16%) have been selected for a total EC contribution of ECU 72.4 million (to be funded from the 1998 budget). Another 36 proposals were put on a reserve list.

On the issue of transmissible spongiform encephalopathies (TSE), a joint call for proposals for RTD activities within the BIOTECH, FAIR and BIOMED specific research programmes was launched on 29 April 1997. As a result of the evaluation, 12 proposals in the field of BIOMED have been shortlisted for an EC contribution of ECU 12 million.

The report of the "Life Sciences and Technology interprogramme group on vaccines" established the first inventory of all vaccine research undertaken with Community support together with an analysis of R&D activities currently being undertaken in the Member States in this field.

A workshop on synthetic drugs was organised in September 1997 which helped to define future priorities for research on medical, pharmacological and toxicological issues of synthetic drug abuse.

A conference under the title "Diabetes in Europe - A Major Health Problem and a Research Opportunity" was organised by the Commission in March 1997 to discuss future RTD priorities in this field.

An invitational conference on the occasion of the Netherlands EU presidency on "Innovative research and appropriate health care for the citizens of Europe", held in April 1997 in Noordwijk, assembled scientists and decision-makers around the question of how public health research can meet, in a European perspective, the health needs of the European population.

As a follow-up to the recommendations of the monitoring exercise in 1996 the programme has endeavoured to improve even more the existing review process notably by increasing the transparency of the evaluation and ameliorating the feedback to the applicants. Furthermore strong emphasis has been put on the monitoring of ongoing BIOMED projects by setting up a new project review board consisting of internationally recognised experts.

Examples of results

A European multi-centre study on schizophrenia involving eight European Member States resulted in the identification of an association between a specific serotonine receptor gene and schizophrenia which can be considered as a significant breakthrough in the field of psychiatric genetic research.

A European group of geneticists working on human inherited neurosensorial deafness were able to clone the first two genes responsible for isolated forms of deafness. Moreover the consortium was able to give a first insight into the molecular epidemiology of deafness.The frequent involvement of one of the numerous deafness genes in the European population offers for the first time the opportunity to develop a molecular diagnostic test for counselling.

Contribution to Community RTD objectives

Research in the cancer area is covering a very large area from basic science to pure clinical proposals. Gene therapy approaches are considered in both basic molecular science projects and for use in clinical practice. Particularly strong proposals in tumour immunology involve pharmaceutical companies.

In the cardiovascular area excellent European expertise is developing in the areas of: cellular and molecular mechanisms (e.g. role of growth factors); genetic basis of diseases of high prevalence such as hypertension, coronary heart disease and stroke; and clinical research including clinical trials and identification of pertinent risk factors.

Research in the area of chronic diseases, ageing and age-related diseases puts special emphasis on chronic inflammatory diseases, diabetes and genetic predisposition of age-related changes. Occupational and environmental health research proposals relate to musculoskeletal disorders, sensitisation against occupationally induced allergens and occupational cancer risk.

Several proposals in the area of rare diseases are focusing on severe childhood diseases. One project aims at creating a European network of information centres for rare diseases.

The proposals selected in the area of public health research cover topics such as prevention and surveillance (notably on Creutzfeld Jacob Disease); cost benefit and socio-economic research on therapeutic outcomes; the use of new or known technologies and the quality of health care and health services research.

In biomedical ethics research focuses on: end of life and palliative care; autonomy and consent for vulnerable patient groups; and ethical aspects of decision-making procedures in various health settings.

The horizontal activity 'Ethical, Legal and Social Aspects'(ELSA) reflects research into fundamental values and methodologies in bioethics, embryo and foetus protection, and social implications of human genome research.

Finally the selected demonstration projects aim to prove the viability of new medical practices such as a new test for a reliable indicator of cardiovascular risk, a new biomedical technology (hybrid-liver support), and innovative surgical practices using new biodegradable implants for corrective surgery of rare craniofacial syndromes.

The selection of the BIOMED-TSE proposals in the joint call strengthens and complements the previous BIOMED selections in this field. It also allows the development of a comprehensive European research effort in essential issues such as the epidemiology and surveillance of human SEs, the harmonisation of clinical and diagnostic procedures and the characterisation of the role of the infectious agent in the development of the disease(s).

A group of European scientists examined the role of hypoxia on changes in the arterial wall that might be atherogenic and discovered that vascular endothelial growth factor (VEGF) might protect against atherosclerotic damage in the adult artery. This research gave rise to an international patent for a potential new treatment for arterial disease using VEGF. As a follow-up a company "Eurogene' was set up with venture capital, which funds a relevant Phase I clinical trial but also further research for new patentable agents and new pharmaceuticals in four research institutes in Europe.

European scientists have developed a simple, sensitive and inexpensive method for recording the activity of individual neuronal synapses in the brain. This technique will make it possible to assay the action of drugs and toxic substances on brain functions such as learning and memory.

Work programme for 1998

The contracts from the third call for proposals are being prepared. Specific efforts will be made to disseminate and publish the results of the completed projects. Implementation of the Fifth Framework Programme's thematic programme on "Quality of life and management of living resources" will be prepared, notably by drawing up the specific programme, work programme, calls for proposals and information packages. The first Life Sciences Demonstration Conference will take place in Uppsala in 1998. Its aim is to help maximise the outcome of the life sciences demonstration projects under the Fourth Framework Programme. Participants from all BIOMED demonstration projects will be invited.

10. AGRICULTURE AND FISHERIES (including agro-industry, food technologies, forestry, aquaculture and rural development)

Activities in 1997

In 1997 the specific programme for agriculture and fisheries continued to pursue its original objectives: to increase the competitiveness, efficiency and sustainability of agriculture and the fishing industry, to support the Community policies in these fields and to meet the demand from consumers for wholesome food.

RTD projects, demonstration projects and concerted action:
Following the fourth and fifth calls for proposals, on 13 February and 29 July 1997 the Commission adopted decisions selecting 147 research projects, 16 demonstration projects and 45 concerted actions or thematic networks for funding from the 895 proposals received. The special call for proposals targeted on transmissible spongiform encephalopathies attracted 24 proposals. On 18 July the Commission adopted a decision selecting eight of these projects on the development of methods of diagnosis of TSE and of combating the illness in sheep, goats and cattle.

A joint call for proposals on TSE under the biomedicine, biotechnology and agriculture and fisheries programmes was published on 29 April and closed on 15 July 1997. From the 66 proposals received, 22 (three of them under the agriculture and fisheries programme) were selected and granted a total of ECU 21.3 million. This was made possible by the agreement reached between Parliament and the Council on 1 December 1997 to allocate a further ECU 115 million to the Fourth Framework Programme, ECU 35 million of which was earmarked for research on TSE.

Technology stimulation measures for SMEs:
Contracts were concluded on 118 projects (109 exploratory awards and 9 cooperative projects). The total number of SMEs participating rose from 251 (22% of all participants) in 1996 to 328 (32%) in 1997.

Research training grants:
In 1997 a total of 99 research training grants were awarded.

Contribution to Community RTD objectives

Producing wholesome foods and strengthening industrial competitiveness:
Food projects are, by nature, interdisciplinary, often bringing together researchers from the fields of nutrition, medical science and food technology. Industry is represented (by at least one partner) in virtually all the projects on "integrated production and processing chains" and collaboration between partners from northern and southern Europe is particularly close. High value-added products are obtained from wood, natural fibres, carbohydrates and oils to create new markets or replace synthetic products.

Examples of results

One concerted action produced a set of practical recommendations to safeguard microbiological safety all along the meat-production chain, from the farm to the slaughterhouse and then throughout processing and distribution. They will be extremely valuable for meat producers and distributors and for national and Community inspectors.

The STORMS project for the forestry and timber industry has developed forest management strategies to minimise damage by wind, snow and fire without diminishing the quality or quantity of timber produced. These results have been applied already for forest management in Sweden, Finland and the United Kingdom and should be adopted all over Europe very soon.

Contribution to the reformed common agricultural policy (CAP) and Community rural development policy:
The projects in this field contribute to a better balance between production and utilisation of biological raw materials, meeting the demands of the end-users, particularly with regard to raw material quality. The projects respond to the socio-economic issues facing the communities concerned and the safety, quality, health and environmental implications of new food and non-food products. They are based on comprehensive approaches and the multi-functional and sustainable management of the environment and optimum use of the resources of the rural world.

Support for the objectives of the common fisheries policy (CFP):
The projects selected will help to support various aspects of the CFP. On the environmental side, they will help to promote sustainable fishing and aquaculture, notably by reducing the impact of trawls and other dragnets on the seabed and of fish escaping from fish farms on wild fish. Turning to management of fishing activities in Europe, the socio-economic aspects and improved methods for fish stock assessment are also covered. Finally, work has been stepped up on the health and genetic aspects of aquaculture.

Work programme in 1998:

A second joint call for proposals on transmissible spongiform encephalopathies will be published on 17 March 1998 and close on 17 June 1998. The call for proposals for measures in favour of SMEs open continuously since 16 December 1994 will close on 8 April 1998 in the case of cooperative research projects. As for the projects from the fifth and sixth calls, the two joint calls on TSE and the call for cooperative research projects, these contracts will be negotiated and concluded by the end of the year. A budget of around ECU 179 million is earmarked in 1998 for RTD and demonstration projects, concerted action, research training grants and other accompanying measures.

The AQUA-FLOW network was set up to disseminate the results of Community research projects in the field of aquaculture. It will provide a channel for transferring knowledge and sharing relevant information between scientists and industry.

One project has contributed to development of optimum agricultural production of spelt, an ancient but limited variety of wheat requiring little fertiliser and ideally suited to the less favoured regions of the Community. It also provides a more environmentally sustainable alternative to common wheat.

One project is expected to develop a typology of rural areas and to analyse the socio-economic characteristics of such areas using national and European databases. In particular, it will examine the interactions between local agricultural activities, other sectors of the economy and the public authorities in the EU regions which have managed to maintain or create extra jobs over the last ten years.

11. NON-NUCLEAR ENERGY

R&D component: JOULE

Activities in 1997

The programme continued to focus on priority themes relating to energy technologies and to define the qualitative and quantitative objectives of each call for proposals. A substantial proportion of the budget, some ECU 195 million, was spent in 1997 and two calls for proposals for shared-cost action, covering all the fields of science in the programme, were closed. Over 600 proposals were evaluated and 231 were selected for Community funding totalling ECU 119 million, 62% of them on renewable energy sources.

The JOULE programme made an active contribution to the preparations for the Kyoto conference on climate change and to several Commission communications, including one on "green accounting".

The monitoring report recognised the efforts made on the transparency and openness of the programme and the experts noted the introduction of a quality management system.

Contribution to Community RTD objectives

The R&D supported by JOULE is designed to provide substantial support for the development of renewable energy sources, such as solar energy, windpower or energy from biomass, thereby contributing to sustainable energy supplies for Europe, while preserving the environment. The growing participation in the research projects by partners from industry and users helps to foster technological progress in Europe and to keep these emerging sectors competitive.

More efficient use of energy and management of lighting in buildings will help to improve living conditions while the development of propulsion and energy-storage systems for zero-emission vehicles offers the prospect of a cleaner, quieter urban environment.

Work programme for 1998

The final touches will be put to implementation of the current framework programme by selecting concerted action projects and schemes to provide support for training and SMEs.

A large proportion of the activities in 1998 will be concerned with providing input for definition of the next framework programme.

Examples of results

Techno-economic models supported by the programme have allowed worldwide comparison of costs and emissions of pollutants. These results have made it possible to estimate the costs of technological measures to meet the target set at the Kyoto conference on climate change, i.e. a 15% reduction in emissions of greenhouse gases.

Trials on a dual-fuel diesel/electric-powered bus obtained by converting a conventional diesel bus have proved that very substantial fuel savings can be made, while causing no pollution and very little noise. The industrial partners in the project are now studying how to put this technology on the market.
ZF Friedrichshafen AG has set up a new department especially for this purpose.

Support for the development of new processes based on parallel optimisation of water and energy consumption has produced a 40% water saving and 70% energy saving in the agro-food and paper pulp industries, two traditionally heavy consumers of these resources.

Demonstration component: THERMIE

Activities in 1997

THERMIE is focused on the cost-effective and environmentally friendly demonstration and promotion of clean and efficient energy technologies. These consist of renewable energy technologies, rational use of energy in industry, buildings and transport, a clean and more efficient use of fossil fuels and better exploration, distribution and transport of hydrocarbons.

In 1997 the programme allocated over ECU 148 million to action, often as a follow-up to JOULE results, aimed at proving the technological and economic viability of energy technologies by highlighting their benefits and by supporting a wider replication and market penetration both in the EU and beyond.

THERMIE also provided support for associated measures (ECU 11.5 million) aimed at raising the awareness of the results of the demonstration projects and removing barriers to wider market penetration. Special attention was paid to SMEs by supporting initiatives in which training and information are offered and facilities for project investment are provided. SME involvement in demonstration projects increased significantly: 65% of the proposals in the building sector involved SMEs and participation reached 72 and 76% respectively in the wind and biomass sectors. All in all, 749 proposals were submitted to the THERMIE programme, 275 new contracts were awarded and around 800 running projects were monitored.

In the field of international cooperation, 45 (out of 183) associated measures were supported. Among these measures, three feasibility studies for project implementation within priority areas in China, using innovative EU technologies in the fields of biomass gasification, energy use in buildings and clean coal combustion; two actions targeting the use of renewable energy, specifically rural electrification and energy efficiency in industry, with South Africa; and a business seminar in the renewable sector as a follow-up to the World Solar Summit Programme, initiated by UNESCO.

Following the report of the 1996 monitoring panel, a number of measures were undertaken. Priority was given to site-management control of problematic or risky projects; enormous efforts were allocated to the development of a new computerised programme information system designed to support the whole cycle of management activities from proposal submission to technical and financial project monitoring; enhanced contract negotiations and accurate administrative follow-up of the associated preparatory procedures are now performed under the responsibility of a Task Force on Contracts (TFC); a new strategy for disseminating and publicising the results was agreed and implemented; new initiatives concerning the participation of SMEs were launched; and success stories for promoting emerging energy technologies are now widely disseminated through the OPET - Organisation for the Promotion of Energy Technologies- (joint initiative with the Innovation programme) and FEMOPET -Fellow Members of the OPET - networks in the EU and Central and Eastern European countries respectively.

Examples of results

The establishment of major demonstration sites focusing on energy/environment in cities and residential and commercial buildings are the result of an important contribution by the programme. The Greencities and RE-START projects have been implemented in many cities in Europe, and include over 32 500 buildings. These large-scale projects have the capacity to transform urban design development.

Eight European cities have decided to take an active role in promoting the use of low and zero emission vehicles. Between them these cities have over 20 million inhabitants. Energy reductions from the outcome of this project are expected to be about 20%, depending on the type of vehicle fleet and other measures taken in the city. Substantial reductions in emissions of carbon monoxide, carbon dioxide and NOx are also expected.

Contribution to Community RTD objectives

The actions supported under the umbrella of the THERMIE programme have contributed to promote the innovative use of energy technologies and to maximise the efficiency of their development. The programme focuses investments on the technologies which will produce the maximum benefit for EU citizens and maximises the security and diversity of supplies by improving efficiency of energy production, transport and use and by increasing the use of renewable sources. It accelerates the rate of development and uptake of energy technologies in order to maximise the long- and short-term competitiveness of European industries in EU and global markets.

Support is given to the construction of a 37.5 MW wind farm on a sandbank approximately 3 km off the east coast of England. This will be the largest offshore wind farm constructed in Europe to date.

The many developments included cost reductions and small-scale systems for wind energy and photovoltaics, demonstration plants for energy from biomass and wastes, energy efficiency in industry and combined heat and power production, best practices in buildings, alternative fuels in transport, new burners of solid fuels and co-combustion with biomass.

Work programme for 1998

The THERMIE programme will provide funding estimated at ECU 96 million for the demonstration of clean and efficient energy technologies and it will support, to the tune of up to ECU 14 million, complementary associated measures designed to propagate and encourage at the appropriate moment the future use of demonstrated results.

Other examples from THERMIE

In the hydrocarbons area, installing and decommissioning deck units in the open sea together with direct validation of the structural integrity of floating production, storage and offloading units (FPSOs) made significant steps towards the safety and competitiveness of European offshore energy technology.

Important progress has been made by a number of completed projects focusing on biomass gasification within existing/conventional coal-fired power stations and/or boilers.

The China-EU Renewable Energy Technology Conference was attended by 90 representatives from Chinese institutions and companies and by over 35 EU renewable energy technology manufacturers.

12. NUCLEAR FISSION SAFETY

General objectives

The programme is part of the 1994-1998 Euratom framework programme for research and training and is active in: innovative approaches in reactor safety passive decay heat removal and innovative nuclear fuel cycle concepts (partitioning and transmutation); reactor severe accident phenomena and mechanisms to develop accident management measures, with emphasis on mitigation techniques; safety evaluation methods and feasibility of concepts for radioactive waste management and disposal; technology and strategy for the decommissioning of nuclear installations; radiological impact on man and the environment, radiation mechanisms and epidemiology, radiation risks and exposures; the mastering of events of the past (fa0ctors influencing health, contaminated territories and emergency management approaches).

Activities in 1997

The programme was implemented by a single call with two deadlines for submission of proposals on shared-cost projects (20 March 1995 and 28 February 1996), while a call on concerted action was continuously open until 1 November 1997. In total, 66 proposals for concerted action were received in 1997 (16 on 15 February and 50 on 1 November) and evaluated with the assistance of external experts. At the end of the year, a first set of 11 contracts were signed, while the selection procedure for the last 50 proposals was started.

From the beginning of the programme up until the end of 1997, 190 multi-partner contracts were signed (out of 461 proposals in total). Projects with related research subjects were combined into 38 clusters to ensure better project management and to facilitate the exchange of results among specialists.

Where appropriate, mid-term reviews have been carried out for adjusting project plans or for setting-up the programme for a second phase of the projects.

Four EUROCOURSE training sessions were organised: three courses in the field of radiation protection and one course on reactor severe accidents.

Accompanying measures (conferences, workshops, grants) were organised, developing a wide forum for discussion/exchange of results and offering attractive prospects for young scientists and researchers.

Major achievements in 1997 (in addition to the examples in the boxes) included:

- the progress in the assessment of partitioning and transmutation strategies to reduce the long-lived radionuclide inventories using LWR and/or FNR;
- the feasibility studies for innovative safety techniques like passive decay heat removal systems for both RPV and containment;
- the improvement of knowledge and harmonisation of predictive tools for irradiation induced ageing phenomena;

Examples of results

Design/equipment and operating procedures are being developed in cooperation with industries to cope with the main risk issues in case of reactor severe accidents (i.e. molten corium, fission product releases and hydrogen combustion).

Completion of the RODOS decision support system for the off-site management of nuclear accidents in the early phase: this version is being implemented for pre-operational use in emergency centres in Hungary, Poland, Slovakia and the Ukraine with assistance from the ECHO and TACIS programmes (interest in its use has also been expressed by several EU countries).

- the research carried out on waste volume minimisation, characterisation of waste forms, host-rock and backfill materials;
- the conclusion of Phase I of the Palmottu project for characterising and understanding the general flow system at the site;
- the further development of the databank on decommissioning of nuclear installations;
- the concerted action aimed at providing a forum for dialogue between industry, regulators and academia on risk governance, particularly in terms of acceptability and efficacy;
- the development and use of multi-step cancer models to analyse epidemiological data;
- the development of methodologies for vulnerability assessment of ecosystems;
- the publication of a series of documents giving guidelines and protocols for quality criteria for different common diagnostic procedures;
- the development and implementation of a decentralised approach for management and improving living conditions in contaminated territories.

Improvement of the technical feasibility of geological disposal concepts and of the performance assessment study for spent fuel disposal concepts (implementation of the FEBEX project, start of the operational phase of DEBORA and definition of the SPA-source term model).

Contribution to Community RTD objectives

The nuclear fission programme contributes to the improvement of the safety of nuclear reactors and of the competitiveness of the nuclear industry in particular through research concerning major accidents, advanced techniques for the decommissioning of nuclear facilities and methods for the safe management of radioactive waste. It also aims at protecting the public and the environment against the possible adverse effects of radiation which can result from the use of nuclear energy and the medical applications of radiation.

A decentralised approach to the long-term management of contaminated territories has been developed and piloted in a village in Belarus. While the project is continuing, the success already achieved is such that consideration is already being given to the wider dissemination of the approach to Chernobyl affected areas.

Work programme for 1998

The implementation of the programme will be completed by a selection of concerted action and accompanying measures for training and dissemination of results. Five training courses will be organised by the programme in the fields of reactor safety and radiation protection.

The nuclear fission safety components of the Fifth Framework Programme will be prepared as well as the corresponding implementation instruments.

13. CONTROLLED THERMONUCLEAR FUSION

Activities in 1997

The long-term objective of the programme, which embraces all the activities undertaken in the Member States (plus Switzerland) in the field of fusion with magnetic confinement, is "the joint production of safe, environmentally sound prototype reactors". After the tokamak known as JET (Joint European Torus), the proposed strategy towards the prototype reactor includes an experimental reactor ("Next Step") which is now being designed in detail in the context of the quadripartite cooperation between Euratom, Japan, Russia and the USA referred to as ITER-EDA (International Thermonuclear Experimental Reactor - Engineering Design Activities) and a demonstration reactor (DEMO).

"Next Step" activities: in 1997 the engineering design activities of the central project team (San Diego, Naka and Garching) and the four partner teams collaborating in the ITER-EDA made it possible to optimise the solutions selected for the ITER. At the end of December the central team submitted the final report on the project to the partners involved in the ITER for an internal assessment. Europe has been given the task of coordinating three of the seven major RTD projects for the ITER (prototype toroïdal magnet, shielding for the blanket and remote handling system for the divertor) and is contributing actively to work on them. The NET, JET and JRC teams together with the associated fusion laboratories ("associations") each made a substantial contribution to the work on physics and technology applicable to the ITER. JET, the only reactor in the world capable of using tritium, provided a means of studying fusion plasmas in the conditions planned for the "Next Step".

Concept improvement: operation of specialised devices allowed consolidation of the database required for the Next Step and concept improvements which, in the long term, will allow definition of DEMO. The TJ-II stellarator in Madrid entered into service. Approval was given for the installation of new equipment at the TORE SUPRA tokamak in Cadarache and the TEXTOR tokamak in Jülich and of the heating system at a third (the MAST tokamak under construction at Culham).

Long-term technology: work continued on long-term technology, particularly on the tritium breeding blanket (procedure launched for the provision of reference structural material), evaluation of the conceptual design of a neutron source, start of new safety and environmental studies and of socio-economic research on fusion (including questions relating to public acceptability). Finally, in September Parliament held an STOA conference on the operating conditions required for a commercial fusion reactor to consult experts from Europe's leading electricity distributors.

Industrial participation: European industry has long been involved in supplying the components and prototypes required for the construction and operation of fusion devices.

Examples of results

JET recently operated with the fuel and conditions envisaged for the fusion reactors of the future. It set world records (16 MW of fusion power, equivalent to two thirds of the injected power; 21 MJ of fusion energy). The results obtained indicate that some of the conditions necessary for the reactor (particularly the minimum power for access to high confinement regime) are easier to meet than originally thought.

Projections of economic and social scenarios, economic prospects and public acceptance aiming at raising awareness of fusion as a potential energy source.

In April representatives of the industry exchanged views with representatives of ITER on the organisational aspects of eventual construction of such a reactor.

Implementation: the programme is implemented in the form of contracts of association with the Member States (plus Switzerland), the JET joint undertaking and the NET (Next European Torus) Agreement which includes Euratom's participation in ITER-EDA, contracts with industry and other contracts of limited duration. The Community contributed 25% towards the current expenditure of the Associations and the contracts of limited duration and 45% of the investment costs of priority projects approved by the Consultative Committee for the Fusion Programme. Up to 100% may be granted for certain specific tasks (in industry). As part of the activities to keep in touch with inertial fusion technology, a start was made on coordinating civil research in this field. The Commission proposal for the Framework Programme for 1998-2002 includes fusion as one of the key actions and maintains the strategy for integrated research with a view to the reactor. In its 1997 report the monitoring panel found, amongst other things, that the fusion programme had been administered and implemented fully in line with the Council guidelines.

Important scientific results have been obtained at the associated fusion laboratories, particularly: successful operation of the Lyra divertor in the ASDEX Upgrade tokamak; progress in optimisation of the bootstrap current and of non-induced current drive in the TORE SUPRA tokamak; use of high atomic number materials with ECRH (electron cyclotron resonant heating) in the FTU tokamak; high confinement regimes in the TEXTOR tokamak; determination of reference parameters in the TCV tokamak; magnetic surfaces in accordance with predictions in the TJ-II stellarator; start of construction of the Wendelstein 7-X stellarator and production of prototype coils for this device, etc...

Contribution to Community RTD objectives

As with the other fusion programmes elsewhere in the world, the European Union's programme is directed towards the Next Step, which will incorporate all the key aspects of physics and technology necessary for the "combustion" of long-pulse fusion plasma. Europe has made a valuable contribution to progress with research in this field, particularly with JET.

By placing an obligation on laboratories to publish Europe-wide calls for tenders to carry out priority projects, the fusion programme has encouraged a two-way flow of information between the fusion and industry sides and helped to reinforce European industry's S&T base. In turn the system for qualification of firms in the 15 specific technologies required for fusion has helped to make European industry more competitive against its rivals for collaboration on ITER.

The integrated structure of the programme guarantees the cohesion of European research on fusion. Irrespective of any transfers of technology which could be generated in the short term, the long-term aspect of this research was underlined by stepping up the public awareness campaign on the safety and environmental advantages of fusion as an energy option.

Work programme for 1998

The Associations will continue their activities and new systems for installation on certain devices (particularly ASDEX Upgrade) will be examined. To support the experimental work in all the laboratories, theoretical work will continue. The research on JET, particularly on the divertor concept applicable to the ITER, will continue as planned. As requested by Parliament, the Commission will submit a strategy paper on the possibility of continuing to use JET after December 1999 and on the framework for its future programme. As regards ITER-EDA, originally planned to run until July 1998, a three-year extension has been proposed to undertake joint activities in various fields (adaptation of ITER

engineering design to actual conditions at specific potential sites, safety assessments and preparatory work for applications for consent, tests on prototype components, etc.). Preparations will start for a study on the reference design for DEMO. Like last year, Marie Curie fellowships will be granted (between 10 and 15 per annum) and strong support will be given to the mobility of researchers (between 300 and 400 secondments per annum). The final touches are now being made to establish bilateral collaboration with Russia, Ukraine and Kazakhstan.

14. TRANSPORT

Activities in 1997

With the 109 new contracts which were signed in 1997 from the implementation of the second and third calls for proposals, the Transport RTD Programme has now financed some 244 projects of which 26 were completed with a number of significant results delivered.

The new contracts signed in 1997 cover the following areas of the Programme:

- Strategic research: 13 projects, with emphasis on information systems (including definition of transport databases) and policy assessment (including the extension of the trans-European networks to eastern Europe);
- Rail transport: 10 projects, focusing on interoperability of train systems and on more efficient and faster freight transport;
- Integrated transport chains: 12 projects, addressing the improvement of the quality of the intermodal transport network (6 projects) and terminals (6 projects);
- Air transport: 17 projects, the majority of which (10 projects) contribute to the definition of technical and operational solutions to improve the efficiency of the air traffic management system;
- Urban transport: 12 projects, with emphasis on the enhancement of intermodality in urban transport through the improvement of interchange and through legal and regulatory measures;
- Waterborne transport: 24 projects, including projects aiming at improving the efficiency and safety of maritime operations and projects focusing on the improvement of working conditions;
- Road transport: 19 projects, aiming at improving road transport performance, reliability and safety, while minimising the negative impact on the environment;
- Accompanying measures: 2 projects which will develop and implement an intensive dissemination and exploitation plan for the Transport Programme aiming at maximising the impact of the programme results.

In 1997, the programme provided major contributions for the development of important policy documents such as the Green Paper on ports and maritime infrastructure, the forthcoming White Paper on infrastructure charging, the communications on trans-European rail freight freeways and intermodal freight transport.

Other challenges in the field of transport, such as congestion, safety and environmental aspects continue to be tackled, both in ongoing projects and in the fourth call for proposals launched in December 1997. The particular transport challenges of the accession of Central and Eastern European countries are also being addressed through increased participation from organisations from these countries and local dissemination events. Substantial efforts were devoted to ensure the transferability of results, the involvement of relevant end-users and the acceptance of new systems and methods. This is being tackled through encouraging the creation of formal and informal networks and by the establishment of concerted action (13 projects as a result of the first three calls).

Examples of results

ERTMS

Test sites in Germany, France and Italy have been made available for the full-scale testing of the developed European Rail Traffic Management System (ERTMS). European standardisation activities necessary for implementing the ERTMS started in 1997.

MBB

A maritime black box (MBB) similar to the ones used in aeroplanes has been developed to record accident data. Improved accident investigations will increase the safety of ship operations. Further development of the MBB into a cargo black box is envisaged to track shipments and facilitate short-sea shipping and the exchange of documentation.

TAPE

The project developed a software prototype to determine the interaction of landside and airside operations in airports, to optimise the total airport performance in terms of efficiency and capacity.

The 1997 monitoring panel on the Transport RTD Programme concluded that the programme is being managed in a professional and transparent way, although it was concerned by the continuing staff shortages in some areas of the programme. The panel made seven valuable recommendations for the future management of the programme to further strengthen results delivery, which are being taken on board. They are mainly focused on the dissemination and exploitation of results and future elements of transport RTD activities.

Contribution to Community RTD objectives

The general objective of the research carried out under the Transport RTD Programme is to reach conclusions opening up new policy options and to facilitate the implementation of new generic technologies. The objectives of implementing new technologies to increase the efficiency, safety and sustainability of the transport system have also been or will be achieved through a series of projects like ERTMS (European Rail Traffic Management System), MBB (Maritime Black Box), and ATM (Air Traffic Management) related projects.

The 1997 monitoring panel noted the potential benefits to European industry from achievements like European standardisation of railways' signalling systems resulting from the ERTMS projects. The potential impact of these results could lead to a 20-30% reduction of equipment costs, together with a significant increase in European railway manufacturing competitiveness in world transport markets. Another example of strengthening the competitiveness of European industry is the establishment of integrated ship control standards. These projects (ATOMOS II and DISC1) are an important effort to unite the fragmented European industries involved in this domain and at the same time to set universal standards. Other examples of research work contributing to Community objectives are projects in the strategic area assessing the impact of the trans-European transport networks on accessibility and cohesion. A series of urban transport projects aim at the improvement of urban public transport and have already delivered valuable results (e.g. ISOTOPE project).

Work programme for 1998

The fourth call for proposals and the joint call by the Transport and Telematics Application Programmes on transport intermodality, for which a Community budget of some ECU 12 million was allocated, both closed on 16 March 1998. The submitted proposals will be evaluated and subjected to contract negotiation. The fourth call for proposals should result in a number of actions to consolidate results arising from projects from the previous calls and to prepare future Transport RTD activities. As a result of the joint call on intermodality a series of large-scale demonstration projects building upon the results of ongoing research work in the area of intermodality should arise. The first projects are to start towards the end of 1998. A number of projects already financed will conclude their work and present their results in a series of planned dissemination events. A programme-wide dissemination and exploitation strategy will be implemented to ensure the concrete deployment of the RTD results.

ISOTOPE
The project described the advantages and disadvantages of the various organisational forms of public transport services and gives recommendations on adequate contractual and legal frameworks. Data has been examined from 109 urban transport networks in Europe.

Air Traffic Management: Several projects in this domain have been completed and the results have been fed into the development of the future European Air Traffic Management System (EATMS) to be demonstrated in the Fifth Framework Programme.

Information Systems: Concerted action has been started, involving a series of ongoing projects and policy-makers and statisticians from all Member States. It will establish synergies and lay the ground for the creation of a European transport information system facilitating the exchange of and access to transport data, in support of policy decision-making.

15. TARGETED SOCIO-ECONOMIC RESEARCH

Activities in 1997

1997 marked a major turning point in the evolution of the TSER programme. Introduced in 1994 as a new element to the Framework Programme much work had to be done in the early stages of the programme to sensitise researchers and policy-makers to the importance of European level socio-economic research in areas of S&T policy, education and training and social integration and exclusion. However, the recent selection of successful second call projects and the launching in September 1997 of the third and final call means that attention is turning to the consolidation and follow-up of funded activities. Indeed, the programme now comprises a broadly-based portfolio of complementary activities ranging from collaborative research projects and thematic networks, studies and support for conferences in key areas, to specific ETAN initiatives, and to the programme's participation in the Educational Multimedia Task Force.

Given the current stage of development of the programme, and the improvements made both in terms of the policy relevance and in the execution of successive calls, the recommendations made in the 1997 TSER monitoring report primarily concern take-up and dissemination activities.

Contribution to Community RTD objectives

A characteristic of this programme is that all its activities are expected to lead to policy relevant insights. Following the second call a total of 112 shared cost actions, dealing with topics such as the European information society, industrial dynamics and employment, and social integration policies in Europe, will have received Community support. This number will increase by 50-60 new activities arising from the evaluation and selection of third call proposals. Moreover the third call itself was launched on the basis of a revised work programme focusing on three strategic orientations: competition, change and dialogue; work, welfare and employment; and innovation and institutional change. These orientations demand a multidisciplinary approach and thus the third call, which closed in January 1998, set out to solicit proposals which would combine research tasks from two or more of the programme's main research areas.

In addition to this, some 39 grants were awarded in 1997 for accompanying measures. Funded activities include studies on the effects of labour markets on employment, the redistribution of work, the problems and possibilities for self-employment, and support for various fora dealing with topics such as immigrant integration and ethnic conflicts, women in science, and approaches to cultural diversity within educational institutions in Europe.

As regards ETAN (European Technology Assessment Network, supported under area I of the evaluation of S&T policy options in Europe programme), expert working groups were held on the first of a series of topics: ageing population and technology - challenges and opportunities and technology policy in the context of internationalisation. The experts' reports will be presented to policy-makers in the course of 1998.

Examples of results

EVALUE has developed and produced a CD-ROM and Internet media on the (self-)evaluation of universities in Europe. The information available includes case studies, national indicators as well as a flexible evaluation tool.

Following a conference in November 1997 the "Technology, Economic Integration and Social Exclusion" project has published leading-edge articles on world trading environment, regional technology gaps in Europe and competitiveness.

The LoWER project has established a European database on low-wage employment and published a report on "Statistical data available on low-wage employment in the European Union and its Member States". LoWER publishes a newsletter and has a site on the Internet.

A further significant event in 1997 was the launch of five projects, part-funded by the TSER programme, submitted under the Educational Multimedia Task Force's joint call for proposals. These projects, dealing with the processes of learning, the effectiveness of the introduction of multimedia technology and the attendant socio-economic consequences, demonstrate the importance of the social shaping of technology and serve as examples of the more integrative approach to combining social sciences with technology development which is being proposed for the Fifth Framework Programme.

Work programme for 1998

A major activity for 1998 will be the introduction of measures for disseminating and enhancing the impact of insights arising from the RTD projects and networks funded. In addition to the normal mechanisms for dissemination of results at the project level, a number of activities at the level of the programme itself are being planned. An important initiative will be a TSER programme conference planned for the end of 1998. This conference will bring together researchers and policy-makers and will itself be underpinned by a series of policy relevant workshops organised around the thematic clustering of first and second call projects - a concept which was successfully tested in 1997.

Third call activities will centre on negotiating and issuing contracts for projects selected for funding. And a number of possible new ETAN initiatives are under consideration in the areas of global climate change, intellectual property, the assessment of the impact of RTD, indirect support to RTD employment, and women and science.

Furthermore it is anticipated that four more projects submitted under the Educational Multimedia joint call, involving the financial participation of the TSER programme, will be launched.

Work on finalising the role of socio-economic research in the Fifth Framework Programme will take place alongside the above activities.

The RTD networks and high-tech SMEs project has found evidence which links successful globalisation with a high level of local networking suggesting the importance of access to locally developed technologies.

The globalising learning economy: implications for innovation policy is a report based on the preliminary conclusions from several related TSER projects (example of cluster activity).

The KISINN network has produced a review of private sector knowledge intensive services drawing on existing international expertise with special emphasis on the transmission and application of technical and management innovation including the implications for policy implementation.

The REGIS project has found that innovation in Europe tends to be market driven by cost and quality considerations and that pure innovation is rare since the process is characterised more by the recombination of non-original technologies - thus demonstrating the need for better integration of technology centres and universities within the innovation process.

COOPERATION WITH THIRD COUNTRIES AND INTERNATIONAL ORGANISATIONS

Activities in 1997

RTD projects

As part of the cooperation with the Central and Eastern European countries and the New Independent States from the former Soviet Union, ECU 26.3 million was earmarked to fund 110 contracts concluded following the 1996 call for proposals. A call for proposals published in 1997 (main areas covered: environment, health and industry) attracted 1 300 research proposals worth a total of ECU 398 million.

The international cooperation programme (INCO) also continued to provide support for Eastern European countries to participate in the specific programmes under the 4th Framework Programme.

Around ECU 700 000 was earmarked for accompanying measures, particularly support to enable scientists from these countries to participate in conferences. INTAS, funded primarily by the Community, granted ECU 18.8 million to 321 projects covering all fields. And the International Science and Technology Centre (ISTC) set up in Moscow to help with the redeployment of military researchers from the New Independent States from the former Soviet Union received support totalling ECU 13.5 million from the EC for civil projects in 1997 (a total of 19 000 scientists have taken part since 1994).

As for S&T cooperation with developing countries (INCO-DC), in 1997 ECU 65.6 million was set aside to fund 125 contracts. A call for proposals published in 1997 on management of renewable natural resources, agriculture, agro-industry, health and information technologies attracted 1 020 proposals.

Twenty-five new COST projects also began, bringing to 159 the total number of projects in progress in 17 areas (food science, chemistry, transport, etc.). In 1997 the Commission was involved in 11 EUREKA projects.

The monitoring panel stressed the high quality achieved in 1997 in all the fields covered by the programme.

S&T agreements and scientific contacts

The agreement on scientific and technical cooperation between the EU and the USA was signed, the one with South Africa entered into force and negotiations started on a nuclear research agreement between Euratom and Canada. In 1997 negotiations started on an S&T cooperation agreement with Russia and the first expressions of interest were received from certain countries which wish to be associated with the 5th Framework Programme.

Examples of results

A European first in the campaign against parasitic infections: a number of research projects bringing together scientists from developing countries and Europe have been started to discover why some people are more vulnerable than others to parasitic infections. This is the key to an efficacious response. Collaboration with Brazil has demonstrated that genetic factors are to blame for vulnerability to bilharziasis (an illness caused by trematode worms). Scientists have discovered that gene Sm1 on chromosome 5 controls resistance or sensitivity to the disease. Another gene determining sensitivity to fibrosis of the liver has also been identified. These breakthroughs could pave the way for the development of new treatments to provide relief for sufferers from these illnesses.

To promote relations with Japan and Korea in the field of science and technology, 74 European researchers received grants in 1997, taking the total number of EU researchers assisted to work in these two countries to 490.

Technical or political contacts were maintained with non-EU countries and regional groupings. Over 100 seminars, workshops or conferences involving developing countries received support (for example, on soil fertility in Asia and on Aids in Africa). The political dialogue with the EU's Mediterranean partners continued via the secretariat of the Euro-Mediterranean RTD Committee and a formal meeting of the Committee.

Thinking about future guidelines

A communication on the European initiative for agricultural research for development (EIARD) was adopted to improve coordination between the 18 partners involved. Another communication entitled "Scientific and technological research - a strategic part of the European Union's development cooperation with developing countries" was also adopted and then endorsed by the Council.

Study of marine pollution: the Black Sea is ideal for a case study of the impact of pollution on biodiversity. A project involving Romania, Bulgaria, Russia and seven Member States has already brought a fuller understanding of the decline in biodiversity in the Black Sea. A model for predicting the response of the coastal system to attacks on the environment is now being devised.

Contribution to Community RTD objectives

INCO contributes in many ways to promoting the competitiveness of the European economy as a whole. For example, by giving extra value added to Union RTD or helping to define other EU policies (e.g. on transport, energy or fisheries) in the light of the experience of non-EU countries or thanks to the "large market effect" generated as S&T cooperation opens up prospects for commercial cooperation.

International RTD cooperation provides access to know-how, researcher networks and installations (for example, by sending European researchers to Japan). Beyond the strictly scientific benefits, this cooperation contributes to the influence of European science and technology worldwide.

In connection with EU enlargement policy, modernisation of the RTD arrangements in the Central and Eastern European countries together with the support provided by INCO for participation by these countries in the EU RTD programmes helps these countries to prepare to fit into the Union.

INCO-DC has helped to strengthen Europe's research capacity in areas related to development and to stimulate RTD in the developing countries (in 1997 by providing support for networks on malaria and tropical forests in particular), thus backing up the Community's development aid policy.

Another example of the contribution to foreign policy is the International Science and Technology Centre in Moscow (ISTC) which supports the efforts to redeploy Russian military researchers to civil activities.

Fisheries and sustainable development: 15 research projects focusing on new aquaculture techniques, shellfish farming and management of coastal ecosystems were launched in 1997 in conjunction with the EU/ACP fisheries initiative based on the resolution adopted by the ACP-EC Joint Committee. The objective of this initiative is to promote targeted research on aquaculture and sustainable management of fisheries.

Work programme for 1998

The main activities in 1998 will be to monitor the 1600 ongoing contracts (including the preparatory, accompanying and support measures) and the 1997 INCO-COPERNICUS and INCO-DC calls for proposals, to conclude contracts on the participation of non-EU countries in the 1st,

3rd and 4th activities of the Framework Programmes and to select and monitor grantholders (in Japan and Korea).

Other activities will include analyses of the impact of the S&T cooperation agreements, the meeting of the various joint committees responsible for monitoring the cooperation agreements and the Europe-Japan Science and Technology Forum. As recommended by the monitoring panel, a management information system will be implemented and the publicity campaign on INCO will continue in various forms: written (success stories, catalogue of INCO projects, etc.), audiovisual (slides, etc.) and electronic (INCO homepage on Cordis-Europa).

The political priorities will be to prepare for enlargement, particularly by encouraging full association of the applicant countries in the Fifth Framework Programme, and to build closer relations with the non-associated Central and Eastern European countries. The S&T agreements between the EU and the USA and Russia will also be concluded.

Looking ahead to implementation of the Fifth Framework Programme, there are plans to amend various S&T agreements (the EEA Agreement must not only be extended to the Fifth Framework Programme but also adjusted to take account of the supplementary funding for the Fourth Framework Programme).

Coordination of S&T with the Member States will be stepped up, for example via the secretariat for the European initiative for agricultural research for development, by coordinating individual Member States' health programmes, via the Member States' contact group and within the biotechnology network set up as part of the cooperation on S&T with China. Efforts will also be made to obtain a fuller picture of cooperation in the RTD field between the Member States and non-member countries and international organisations (INCOPOL study).

The redeployment of international cooperation in the Fifth Framework Programme will call, inter alia, for defining the interactions between the INCO programme and the other programmes in the Framework Programme and producing stronger synergies between COST, EUREKA, international organisations and the Framework Programme.

Bone marrow donors: with the help of a partner from the Netherlands, both Hungary and the Czech Republic were linked up to an international database on bone marrow donors. This link-up has added 6 000 extra donors from these two countries to the database. Given the success of the operation, there are now plans to extend the scheme to three more Eastern European countries. It is being introduced in Slovakia already.

Recycling of 50 tonnes of plutonium from military plants in Russia:
In Moscow in April 1996 the G7 countries and Russia decided to cooperate more closely on the downgrading of plutonium from the dismantling of Russia's nuclear weapons.
The Community is making an active contribution to putting these G7 conclusions into action, by financing projects run by the ISTC in Moscow.

DISSEMINATION AND OPTIMISATION OF RESULTS
(INNOVATION PROGRAMME)

Activities in 1997

Activities in 1997 focused on the implementation of (i) the First Action Plan for Innovation (see above chapter I – paragraph 3 of the report) and the specific programme corresponding to the third activity, the INNOVATION Programme.

Implementation of the INNOVATION Programme concentrated on (i) the follow-up to the network of Innovation Relay Centres and CORDIS, (ii) intellectual property and the financing of innovation, (iii) the technology transfer and technology validation demonstration projects and (iv) support for regional innovation infrastructures.

A mid-term evaluation of the network of Innovation Relay Centres (IRCs) was carried out in 1997 prior to its extension for two additional years. Client satisfaction was a major criterion used in the evaluation. It indicated that the network is functioning well and is likely to still further increase its performance during the next two years. The performance of 29 Relay Centres out of 52 (i.e. 56 %) was rated very good. Seven centres (i.e. 14 %) were evaluated as performing below expectations. Following this evaluation, the network of IRCs is being extended for two years and those IRCs rated as performing poorly were restructured.

As regards CORDIS, a user survey was carried out by a professional market research organisation at the beginning of 1997. The survey indicated that CORDIS is known as the major information service for Community R&D and that it is used regularly by the vast majority of intermediaries active in this field. The survey also led to 10 recommendations related to future developments of the system, most of which, after discussion with the programme committee, were taken into account in the call for tenders for provision of the CORDIS service over the next two years (OJ S 247, 19.12.1997, p. 27). A new type of user service was introduced, called Rapidus, allowing users to receive automatically, via e-mail, information tailored to their expressed needs.

The main activity in the area of financing innovation has been the launch of the I-TEC pilot project in cooperation with the European Investment Fund. I-TEC is to support the establishment of an adequate availability of skilled human resources able to appraise and follow up early stage, technology investments, and thus, in the medium to long term, to encourage venture capital investment in such projects.

Also a call was launched inviting proposals for the transnational transfer, promotion and dissemination of measures, schemes and good practices, to bring together financiers, technologists and SME support organisations and to stimulate the creation of firms by researchers (public and private). One of the proposals selected is a consortium consisting of National Westminster Bank (UK), Deutsche Bank (Germany), ING Bank (NL), the Innovation Partnership (UK) and the Fraunhofer Gesellschaft (Germany) which seeks to further develop and disseminate the Dutch "technology rating system" for technology-based SMEs.

Example of results

INNOVATION's various activities in the area of intellectual property including the IPR parts of the First Action Plan for Innovation and the collaboration with the European Patent Office have given a -if not the- major impulse to important new European initiatives in the area such as the Green Paper on intellectual property and the decision by the European Patent Organisation to set up a web-based pan-European patent information service.

In 1997 the CORDIS-website registered 10 million visits compared to 2.2 million in 1996. Also the average number of active users (using CORDIS at least twice a month) nearly doubled to 47500 in 1997 compared to 25000 in 1996. Circulation of CORDIS Focus increased to 32000 in 1997, compared to 22000 in 1996.

Activities in the area of intellectual property included :

- the development of the concept of IPR helpdesk for EU RTD results and the launch of a call for tenders for establishing such a helpdesk;
- the second round of the "Quick Scan" pilot operation which in collaboration with the European Patent Office checks the novelty of technologies in technology transfer and technology validation projects;
- the completion of the Straus report on the present state of the patent system in the EU;
- the organisation of the PATINNOVA conference (May 1997), one of the major get-togethers of patent professionals in Europe;
- the organisation of the second series of training seminars on IPR involving more than 100 project officers;
- the administration of the Community patent portfolio (approximately 1500 patents) and safeguarding of the European trademarks and logos.

In technology transfer and validation, two calls were evaluated in 1997, bringing to 230 the total number of proposals supported for a definition phase since the beginning of INNOVATION. It is expected that about 150 of them will lead to a larger demonstration phase. SMEs participate in 90 % of the demonstration phases and coordinate 60 % of them. The ultimate objective of these projects is to be test-beds for transnational, often also intersectoral, technology validation and/or transfer and to demonstrate good practice. As such the demonstration phases are built around the following pillars : (i) managing transnational technology validation and/or transfer, (ii) intellectual property, (iii) absorbing or assimilating new technologies, (iv) mastering technological know-how.

Regional actions include audits of regional infrastructures to support innovation and technology transfer. Following the 1997 call for proposals about 90 regions have been participating in this scheme since 1995. Three main types of results are emerging from these projects :

- boosting innovation finance capabilities in regions (e.g. Poitou-Charentes, Hamburg, Wiener-Neustadt);
- development (or reorganisation) of innovation support organisations, in particular technology centres, to better adapt them to SME needs (e.g. Highlands and Islands, Umbria, Extremadura);
- improving links between vocational training and SMEs.

Furthermore some of the participating regions are using the results of these audits to maximise the benefits of EU structural funds' interventions in order to strengthen a homogeneous regional economic and innovation policy (Limburg/NL, Halle/Leipzig/Dassau).

Work programme in 1998

Activities will focus on managing the projects selected in the previous years, the implementation of the continuation of CORDIS, the further development of the IPR and Innovation Financing Helpdesks for EU RTD-results, the preparation and launch of the horizontal programme on "Innovation and Participation of SMEs" under the 5th Framework Programme. The cycle of conferences on "Innovation, creation of new businesses and employment" which was started by the conference in Paris (December 1997), will be continued and involve major conferences in Luxembourg (May 1998) and Vienna (November 1998).

The network of 52 Innovation Relay Centres, during the first 16 months of operation (i.e. from October '95 till February '97) was contacted more than 120000 times for advice related to technology transfer and/or submission of proposals to EU programmes, performed 7500 audits for clients wishing to offer or requiring technology, negotiated 1250 transnational technology transfer agreements of which 190 were signed. In addition the IRCs contributed more than 2750 proposals that were submitted for EU RTD programmes of which 700 were accepted for funding. More importantly the trends in these numbers are increasing.

The first nine venture capital funds selected under I-TEC will invest ECU 186 million of (private) venture capital for early stage technology investments in SMEs over the next three years. (For comparison, in 1996, ECU 441 million was invested in early stage projects in Europe by the venture capital profession as a whole (source: EFVA).

STIMULATION OF THE TRAINING AND MOBILITY OF RESEARCHERS (TMR)

Activities in 1997

Implementation of the TMR programme and of the contracts still in progress under the Human Capital and Mobility (HCM) and Science programmes continued in 1997.

Under the TMR programme, 1 190 contracts were concluded in 1997, of which 980 were for Marie Curie Fellowships, 64 for research networks, ten for concerted action on large-scale facilities and 136 for Euroconferences, summer schools and practical courses. Funding was also approved for 83 new research network projects.

A more active approach was taken to apply the results of the TMR programme and of its predecessors - the HCM and Science programmes. Another major concern throughout the year were the preparations for the specific programme on improving the human research potential.

The accompanying measures for this programme included, in particular, organisation of the 9th European contest for young scientists aged between 15 and 20 in Milan from 9 to 14 September, establishment of the Marie Curie Association to keep in touch with fellows and sound out their opinion on, for example, new Commission proposals, the study by the working party on industry on industrial participation in the programme and the call for proposals to study the role of women in research.

Other action in the course of the year focused on the need to find appropriate solutions to the disparities in the treatment of researchers awarded Marie Curie grants by the Community.

In 1997 big improvements were made in implementation of the programme, as confirmed in the 1997 report by the monitoring panel for the TMR programme. These included:

- considerable shortening of the delays between submission of proposals and notification of the decision to the proposers and signature of the contracts;
- the setting of annual objectives for all units in the programme concerning, in particular, processing of proposals, management of the evaluation panels and management of contracts;
- tighter monitoring of contracts, particularly on-the-spot inspections;
- wider public information on the programme, particularly via Internet;
- improvements in the evaluation procedures, e.g. interdisciplinary approach and greater transparency on points awarded by the evaluators.

Examples of results

A young trainee researcher in one network developed instant teleportation of the quantum state of photons. This should allow consequent improvements in quantum computers.

The NEUROS network is working on restoring the mobility of paraplegics with the aid of implants stimulating muscles. Six young trainee researchers in this network are each working in two different teams and cooperating with the industrial partner.

One young grantholder was given an opportunity to continue his research on functioning of the brain during epileptic fits, particularly on the potential adverse side-effects of long-term treatment with anti-convulsives. The results hold out hope of improvements in the active agents in anti-convulsives to reduce the adverse effects.

Contribution to Community RTD objectives

The programme management measures adopted have significantly boosted industrial participation in the projects. Industrial participation in the "research networks" activity in particular has doubled since the first call for proposals published at the start of the programme and more than trebled compared with the Human Capital and Mobility programme.

There are also plans to introduce industrial fellowships in the 5th Framework Programme.

Participation by entities from the less-favoured regions of the Community also increased, from its already high level.

Employment: By the end of implementation of the TMR programme, grants equivalent to 5 600 researcher-years will have been granted plus a further 6 500 or so under the training and networks activities. Another point which must be stressed is that these grants boost the young researchers' chances of finding a stable job in the research sector at the end of their fellowship.

One young Italian grantholder built an autonomous robot capable of learning simple tasks adapted to the real world. This project has been warmly welcomed. It won the Italian prize for artificial intelligence. The designer has been taken on as a researcher by his host institute.

Work programme for 1998

Work on the TMR programme will continue in 1998, together with completion of the HCM and Science programmes.

In the case of the individual grants, the programme introduced in 1997 for systematic monitoring of the contracts, under which 50% of the grantholders have been contacted, will be completed.

The top priority for the activities on networks and large facilities will be to organise the mid-term evaluations of each contract by panels of independent experts. A conference will also be held on the networks activities to allow closer examination of the performance of a number of them.

Amongst the accompanying measures, preparations will be made to award the first Descartes prize to a group of research teams from different Member States or associated countries which have made a substantial contribution to solving a scientific or technological problem with the aid of transfrontier cooperation and to individual researchers who have attained scientific success in a laboratory or university outside their country of origin.

One young grantholder was able to take his research on superconductivity a stage further towards opening the way to transporting electric currents long distances. He focused in particular on adaptation of the materials to large-scale applications, for example cables and transformers. Having met this challenge this researcher was offered a five-year post by his previous research institute.

With a view to coordination with other training activities, the programme will continue to provide its input to the action plan on the Green Paper entitled "Education - Training - Research. The obstacles to transnational mobility."

Finally, as recommended by the monitoring panel, a call for proposals will be published in 1998 to farm out to an outside agency some of the routine tasks entailed in processing proposals and managing the contracts for the proposals selected. And, of course, preparations for the Fifth Framework Programme will continue.

JOINT RESEARCH CENTRE (JRC)

The Joint Research Centre is the European Union's scientific and technical research laboratory, with headquarters in Brussels. Five separate sites, located in Belgium, Germany, Italy, the Netherlands and Spain, house seven research institutes, each with its own focus of expertise: Reference Materials and Measurements, Transuranium Elements, Advanced Materials, Systems, Informatics and Safety, Environment, Space Applications, and Prospective Technological Studies.

Mission

The JRC promotes and carries out customer-driven research of the highest quality and integrity in support of Community policies. It is an integral part of the Community RTD system. It executes research programmes funded from the Framework Programmes and engages itself in competitive activities, participating in joint projects with industry, research organisations and universities of the Member States.

More than 2000 scientists, engineers and other professionals are employed on a full-time basis under different contractual arrangements: temporary researchers, grant holders, visiting scientists, industry or national government secondments, officials, etc.

The overall credits committed in 1997 were of around ECU 291 million; of these, about ECU 246 million were funded by the Commission budget, about ECU 37 million came from diverse competitive activities and about ECU 8 million from specific funding to the High Flux Reactor (HFR) in Petten (NL).

The year 1997

1997 was a year of strong evolution towards the customer-driven approach undertaken in previous years. Some achievements of 1997 are highlighted in this report. In particular, an innovative form of radiotherapy was for the first time tested on patients suffering from brain cancer, and preliminary clinical trials have shown promising results in treating leukaemia with alpha-immunotherapy.

A Technology Transfer Initiative was proposed, including collaborative agreements for sharing large installations, a capital fund, training and education initiatives, a telematics network for technology transfer, and procedures for bringing forward new technologies to production stage.

Research activities

The JRC research activities, as described by the Council, are those for which the JRC has expertise and special, if not unique facilities in the Community, and which contribute to the implementation of the research and technological development policy of the Community.

These in-house research activities amounted to 65% of the JRC programme budget in 1997. As established by the Council Decisions, JRC research covered subjects such as advanced materials, surface engineering, non-destructive evaluation techniques for the inspection of industrial structural components, reference measurements and materials, the assessment of the reliability of buildings and civil engineering structures, the atmosphere, soil, water and waste pollution, the setting-up

Examples of results

Alpha-immunotherapy:
An alpha-emitting radio-isotope, bismuth-213, was prepared and adapted to a new kind of immunotherapy against cancer. It is a by-product of nuclear energy, derived from nuclear waste, and decays rapidly into a non-radioactive substance. Early clinical trials carried out at the Memorial Sloan-Kettering Cancer Center in New-York, USA, on leukaemia patients, showed for the first time that alpha-particle therapy could be feasible and safe.

Standards and norms for materials:
Standards and norms are of vital importance for industry, in particular when reliability and quality are at stake. The JRC has contributed to new standard test methods for mechanical performance assessment of technical ceramics and composites, thermo-mechanical fatigue, damage tolerance of ceramic composites and residual stress, and to the improvement of existing standards. JRC collaborates closely with CEN (Comité Européen de Normalisation), VAMAS (Versailles project on Advanced Materials and Standards) and ESIS (European Structural Integrity Society).

of the Centre for Earth Observation (CEO), applications of remote sensing techniques; materials for clean technologies, standardisation of photovoltaic devices; the science and technology observatory function and prospective work in which the essential role of the JRC is to analyse, process and integrate factual information on technological trends for decision-makers; studies on reactor safety, nuclear safeguards, fissile materials management, safety of nuclear fuels, fundamental research into actinides, and support to the ITER project.

Support activities

The activities to support the services of the Commission accounted for 35% of the JRC programme budget in 1997. They were related to information technologies, environment and climate, agriculture and fisheries, targeted socio-economic research, and nuclear safety and safeguards. They correspond to activities which necessitate the neutrality of the JRC and respond to requirements arising from EU directives, decisions of the Commission and the Council, or obligations stemming from the Euratom Treaty.

The support activities continued to be implemented in three main lines:

The **support to the environmental policy** which accounted for 43% of the support budget, provided DG XI (Environment, Nuclear Safety and Civil Protection) with scientific and technical assistance for the implementation of the legislation on atmospheric pollution, chemical pollutants, chemical waste, water quality, industrial risks and nuclear safety. This is part of the 5th EC Action Programme on the Environment.

The **support to the common agricultural policy (DG VI),** which accounted for 17% of the support budget, concentrated on applications of remote sensing for agricultural statistics, monitoring and control of the common agricultural policy and implementation of Community legislation and prevention of fraud, including the IDEA project for the electronic identification of animals.

The **support for nuclear safeguards** (Euratom safeguards in support of DG XVII, Energy, IAEA safeguards support of DG I-External Relations) accounted for 28% of the support budget in areas such as training of inspectors, completion of the design phase of the on-site laboratories for safeguards analysis at the reprocessing plant at La Hague and Sellafield, and work on testing of safeguards equipment together with sealing and identification techniques.

Competitive activities

Competitive activities are becoming an integral part of the JRC corporate culture and a significant increase in revenue from new contracts has been accomplished in respect of the two previous years. Where its neutrality is not compromised, JRC develops competitive activities in order to enter new areas, diversify and strengthen its competences.

Under the Community RTD Framework Programmes, the JRC participated in shared-cost action funded by other Community research programmes in association with partners from Member States, for a total contract value of ECU 15.5 million, and obtained contracts for a total value of ECU 18.5 million from the programme for competitive scientific

Boron neutron capture therapy (BNCT) against malignant brain tumors:
BNCT is an innovative form of radiotherapy which is being tested for the first time in Europe at the JRC's HFR reactor at Petten (Netherlands). This new therapy is only at the clinical trials stage (5 patients have been treated with clinical tests that began in October 1997). These tests are also a first case of multi-national clinical application in Europe: patients from one country are treated in another country by physicians from a third country.

Environmental sampling:
The JRC is actively contributing to the EU policy to support and strengthen the International Atomic Energy Agency's activities in nuclear safeguards as a member of its network of laboratories for the analyses of environmental samples. JRC is also providing similar support to the Commission's Euratom Safeguards Directorate (ESD) in the area of high performance trace analysis.

and technical support activities described in the next section, in response to invitations to tender.

Outside the Framework Programmes, the JRC obtained new contracts from third parties (mainly research services to industrial companies), for a total of ECU 11.1 million. It participated in various other Community activities that are put out to tender such as PHARE, TACIS and cooperation with developing countries for a total contracted value of ECU 6.1 million.

High Flux Reactor (HFR) supplementary programme

The HFR is operated by the JRC in Petten (Euratom/Netherlands agreement of 25 July 1961 and Council Decision of 27 June 1996 for a supplementary research programme covering 1996-1999). Besides its traditional work for the nuclear R&D and industry, a large part of HFR activities are dedicated to medical applications such as the implementation of Boron Neutron Capture Therapy (BNCT) and the production of medical radioisotopes for the European radio-pharmaceutical industry. Another significant achievement is the upgrading of a beam tube, used for the measurement of residual stress in materials by neutron diffraction. This technique is applicable to a wide range of components used in industrial plants, aeronautics, or the car industry.

Communication, collaboration, publications and conferences

The JRC promotes collaborative research and networks with partnerships from all the EU Member States and around the world. The JRC is involved in collaboration agreements with research organisations, universities, and private industries. It now has more than 1000 partners, out of which 875 are from the European Union.

In 1997 the JRC published a total of 1 333 papers, the detailed list being published each year in the "Publications Bulletin". The latest issue, No 17 of March 1997, lists all publications issued in 1996.

In addition to publications, there were 23 patents granted in 1997, a considerable increase in comparison with previous years .

Each year, the JRC organises a number of conferences, workshops and seminars at its five sites in Europe and information days in the Member States. The numerous visitors show the constant interest of the scientific community in the contributions made by the Joint Research Centre to research and development. Its achievements received considerable media attention during 1997.

More detailed information can be found in the 1997 JRC Annual Report.

Work programme for 1998

1998 will be a most important year when, on the one hand, objectives set forth at the beginning of the Fourth Framework Programme will be accomplished and, on the other hand, the transition to the new priorities foreseen for the JRC activities in the Fifth Framework Programme needs to be initiated. The work programme of the JRC for 1998 was approved by the board of governors in December 1997.

Safeguards plant at Obninsk:
JRC, with the Institute for Physics and Power Engineering (IPPE) at Obninsk, Russia, has been given the task of designing and implementing the Safeguards Methodological and Training Centre in IPPE. The principal tasks of the Centre are the training of plant operators and of inspectors of the Russian authorities to help in the development and implementation of upgraded approaches for accounting and safeguarding fissile materials. The project is financed by the TACIS Programme to improve nuclear material accountancy and control in Russia.

Technology transfer and intellectual property:
mechanisms have been proposed for providing technology users across Europe with access to JRC facilities, results, intellectual property, expertise and know-how. They offer flexible options such as collaboration agreements and innovation-oriented actions. An effort was made in 1997 to increase the awareness of the JRC staff on intellectual property issues and patent coordinators were trained.

ANTI-PERSONNEL MINE DETECTION SYSTEM AND STRATEGIES

JRC set up an outdoor test range for establishing standards to validate the performance of mine detection sensors (e.g. metal detectors, ground penetrating radars and thermal infrared sensors). The facility has been used by various mine-detection sensor producers, and in feasibility studies of a multi-sensor system for anti-personnel mine detection and identification. The standards obtained will be applied to subsequent tests, as well as to mine clearance projects suppoted by the European Commission in mine-infected countries.

QUICK RESPONSE TO CONSUMER CONCERN: SAFETY OF EURO COINS

In the field of heavy metal traces of environmental or biomedical relevance, analytical research was carried out on the release of nickel from euro coins. Concern had been raised by the European Bureau for Consumer Protection about the potential of nickel released from such coins to provoke allergies while being handled by consumers. The JRC carried out the necessary chemical reference measurements and found that the nickel released from the new euro was similar to that of many coins currently in circulation, and substantially lower than some of them.

COMPETITIVE SCIENTIFIC AND TECHNICAL SUPPORT ACTIVITIES

The Fourth RTD Framework Programme provided for a competitive approach for scientific and technical support to Community policies. These support activities come under a separate specific programme adopted by the Council on 15 December 1994 (Decision 94/918/EC). These activities cover the work carried out for the Commission's Directorates-General and which, since 1995, may be carried out either by a research organisation from a Member State or by the JRC (competitive approach), where the neutrality and independence of a Commission service is not required.

These activities are implemented in two stages:

- re-allocation on an annual basis of the appropriations available between the various Commission Directorates-General and services;
- administration of these resources by each Directorate-General or service concerned.

In order to guarantee appropriate transparency and satisfy the needs, the resources are allocated by an interdepartmental group representing all the Directorates-General and services concerned and convened and chaired by the Commission's Secretariat-General. It meets on an ad hoc basis, but at least twice a year.

This group examines the needs identified by the Directorates-General. It analyses requests, verifies compatibility with the objectives of the Framework Programme and decides on an annual allocation within the limits of the available budget (budget heading B6-792). Account is also taken of any funding available from other programmes and scope for integration or convergence between several projects.

The Directorates-General and services whose proposals are selected are responsible for managing the funds allocated. They bring into play competition between suppliers (which may include the JRC) in order to secure the best terms in the light of their requirements. The resources allocated are managed in accordance with the relevant rules in force, in particular the provisions of the financial regulation applicable to the general budget of the European Communities.

Examples of results

The TREES II project entered its third year in 1997. The objective is to develop a prototype system for monitoring tropical rainforests worldwide.

In the ECCAIRS-4 project to improve safety by creating a new instrument for detecting safety deficiencies in civil aviation, a system for pooling data gathered at national level under the system for compulsory submission of incident reports by air operators has been developed and brought into service.

From financial commitments totalling almost ECU 38 million available in 1997, the 16 spending departments funded 99 new or ongoing projects (one project may give rise to several contracts) totalling ECU 36 million, i.e. an implementation rate of 95%.

A total of ECU 23.7 million was paid out for all the projects in progress in 1997 to research institutes, universities, bodies, other contract signatories and to the JRC, all selected on a competitive basis.

Following the participation of two additional services in the activities covered by the budget heading in 1997, three new services submitted requests for 1998. Altogether 20 Directorates-General and services will draw on the commitment and/or payment appropriations for competitive scientific and technical support activities in 1998.

ANNEX II

STATISTICAL AND FINANCIAL DATA: 1997 ANNUAL BASIS AND FRAMEWORK PROGRAMMES

DESCRIPTION OF TABLES

Tables 1-8 provide an overview of Community RTD activities in 1997 under each specific programme in quantitative terms (number and nature of projects, number of participations, level of funding, etc.). The figures refer to all indirect activities under the third and fourth framework programmes for all projects. The figures relating to payments made are based on budgetary data (Sincom) and not on the contracts signed. The data take account of the participation of Member States and of countries having concluded specific agreements with the European Union: European Economic Area, and Israel.

Tables 1 and 2 concern all shared-cost actions, special measures, concerted actions, and preparatory, accompanying and support measures.

Tables 3A and 3B indicate the number of contracts signed and the associated Community contribution since the beginning of the 3rd and 4th framework programmes respectively. The number of projects under way and payments are also given: as in Table 1, payments are based on budgetary data (Sincom) and not on the contracts signed.

Tables 5A-7 concern shared-cost actions only.
Tables 5A and 5B indicate amounts and percentages respectively.
Table 6 concerns access to research for Objective 1 regions, and indicates the number of projects and the associated Community contribution to which the Objective 1 regions have access, and the number of participations from Objective 1 regions.
Table 7 indicates the number of collaboration links between countries and between participants from the same country. It excludes international organisations, which generated a further 412 links.
(To understand *Tables 6 and 7*, please read the footnotes carefully.)

Tables 4 and 8 concern calls for proposals made in 1997 and 1998 respectively. They are not generated from a database, but are compiled on an *ad hoc* basis from the most exhaustive information available.

Tables 9. 10 and 11 concern budgetary commitments.
Table 9 concerns the funding of the fourth framework programme and takes account of enlargement and the additional funding.
Tables 10 and 11 indicate the trend of Community research commitments in current prices and in 1992 prices respectively, in accordance with the Edinburgh summit, which covered the period 1992-1999.

N.B. For the sake of simplicity, the programme on agriculture and fisheries, including agro-industry, food technologies, forestry, aquaculture and rural development, is sometimes referred to simply as the agriculture and fisheries programme.

Table 1: EC FP4 + Euratom FP; EC FP2 + FP3

	New projects (contracts signed (2) in 1997 - EC FP4 + Euratom FP)						All projects under way (3) (EC FP2 + FP3 + FP4 + Euratom FP)	
	Community contribution (ECU million) (4)	Number of projects	Number of participations	Average number of participations per project	Average number of MS per project (5)	Average Community contribution per project (ECU million)	Number of projects under way at 31.12.97 (6)	Total payments 1997 (ECU million)
Shared cost actions (1)	2209.11	4072	17900	4.40	2.87	0.54	8064	2109.67
Concerted actions (1)	41.18	129	1631	12.64	7.79	0.32	453	39.34
Preparatory, accompanying and support measures (1)	354.32	2141	4246	1.98	1.58	0.17	2542	338.47
TOTAL (7)	2604.61	6342	23777	3.75	2.56	0.41	11059	2487.48

(1) Special measures are attached either to shared-cost actions, or to concerted actions, or to preparatory, accompanying and support measures, as appropriate.
(2) Contracts signed in 1997, whether or not amended by supplementary contracts signed in 1997: see (7).
(3) All signed contracts under way (completion date after 31.12.1997) for all specific programmes under EC FP4 + Euratom FP; EC FP2 + FP3.
(4) Sum of the total Community contributions to all new projects, as stipulated in the contracts (i.e. for the entire duration of each project).
(5) MS = Member States
(6) Projects under way at 31.12.1997 = contracts and supplementary contracts signed before 1.1.1998 with a completion date for research work after 31.12.1997.
(7) The 1 079 supplementary contracts signed in 1997, amending contracts originally signed in 1995 and 1996, accounted for a further ECU 381.29 million.

Direct action - JRC : ECU 246.000 million in commitments

Table 2: Specific programmes EC FP4 + Euratom FP: All projects (contracts signed in 1997)

	Total new projects (contracts signed (2) in 1997; EC FP4 + Euratom FP)						Shared-cost actions (1)		Concerted actions (1)	Accompanying measures (1)
Names of specific programmes (EC FP4 + EURATOM FP)	Community contribution (ECU million) (3)	Number of projects	Number of participations	Average number of participations per project	Average number of MS per project (4)	Average Community contribution per project (ECU million)	Community contribution (ECU million)	Average Community contribution per project	Community contribution (ECU million)	Community contribution (ECU million)
Telematics applications	102.79	102	1107	10.85	5.00	1.01	79.31	1.09	0.20	23.28
Communication technologies	1.15	3	25	8.33	4.00	0.38	0.46	0.46	0.00	0.69
Information technologies	520.77	734	2835	3.86	3.59	0.71	355.39	1.36	0.63	164.75
Industrial and materials technologies	492.64	944	4490	4.76	2.69	0.52	482.11	0.60	0.00	10.53
Standards, measurements and testing	43.10	182	828	4.55	3.05	0.24	39.67	0.29	0.20	3.23
Environment and climate	126.87	298	1203	4.04	2.69	0.43	116.12	0.70	3.95	6.80
Marine science and technology	50.03	92	316	3.43	2.21	0.54	47.03	1.09	0.20	2.80
Biotechnology	130.24	309	878	2.84	2.89	0.42	117.14	0.92	1.02	12.08
Biomedicine and health	92.01	212	1229	5.80	3.40	0.43	79.14	0.62	11.59	1.28
Agriculture and fisheries	142.18	347	1674	4.82	4.82	0.41	124.84	0.58	12.66	4.68
Non-nuclear energy	251.71	492	2097	4.26	2.83	0.51	238.35	0.72	0.00	13.36
Transport	77.89	109	1010	9.27	5.18	0.71	60.67	0.71	2.63	14.59
Targeted socio-economic research	38.83	108	485	4.49	3.68	0.36	37.06	0.57	0.00	1.77
International cooperation (5)	163.03	797	2695	3.38	1.60	0.20	128.23	0.37	4.12	30.68
Dissemination and utilisation of the results (6)	72.5	202	822	4.07	2.50	0.36	19.45	0.18	0.00	53.05
Training and mobility of researchers	178.74	1193	1725	1.45	1.28	0.15	168.73	0.16	2.00	8.01
Nuclear fission safety	4.24	47	170	3.62	2.66	0.09	0.99	0.33	1.98	1.27
Controlled thermonuclear fusion	115.89	171	188	1.10	1.09	0.68	114.42	0.85	0.00	1.47
TOTAL (7)	2604.61	6342	23777	3.75	2.56	0.41	2209.11	0.54	41.18	354.32

(1) Special measures are attached either to shared-cost actions, or to concerted actions, or to preparatory, accompanying and support measures, as appropriate.

(2) Contracts signed in 1997, whether or not amended by supplementary contracts signed in 1997: see (7).

(3) Sum of the total Community contributions to all new projects, as stipulated in the contracts (i.e. for the entire duration of each project).

(4) MS = Member States

(5) Horizontal international cooperation actions permitting certain non-member countries (e.g. those of Central and Eastern Europe) to participate in projects under specific programmes account for a further Community contribution of ECU 15.1 million.

(6) "Special measures" (79 projects - ECU 49.45 million) designed to support the establishment of infrastructure and innovation support networks are attached to the "preparatory, accompanying and support measures".

(7) The 1 079 supplementary contracts signed in 1997, amending contracts originally signed in 1995 and 1996, accounted for a further ECU 381.29 million.

Table 3A: Specific programmes under EC FP3: All projects (contracts signed in 1997), all types of project

Names of specific programmes under EC FP3	Number of projects under way at 31.12.97 (1)	Overall number of projects (2)	Total payments 1997 (ECU million)	Overall Community contribution (ECU million) (3)
Information technologies	9	715	45.57	1488.00
Communication technologies	0	123	17.36	521.60
Telematics applications of common interest	0	312	5.51	379.00
Industrial and materials technologies	48	1655	55.05	761.42
Measurements and testing	21	202	6.26	57.69
Environment	5	659	14.97	305.72
Marine science and technology	5	145	6.29	107.72
Biotechnology	0	374	14.81	174.77
Agriculture and agro-industrial research, fisheries	133	578	36.19	350.06
Biomedicine and health	14	627	13.37	144.26
Life sciences and technologies for developing countries	39	355	11.95	121.59
Non-nuclear energy	5	506	10.72	242.14
Nuclear fission safety	0	125	1.55	46.28
Controlled thermonuclear fusion	8	396	7.80	465.94
Human capital and mobility	150	3461	36.34	548.06
Centralized action for diffusion and utilization of results	6	207	1.08	60.76
TOTAL	443	10440	284.82	5775.01

(1) Projects under way at 31.12.1997: contracts signed before 1.1.1998 with a completion date for research work after 31.12.1997.
(2) Total number of projects since the beginning of the third framework programme, including those which have already been completed.
(3) Overall Community contribution over the whole duration of the framework programme.

N.B.: Data on the Thermie programme are not included in this table, since up to 1994 Thermie was not covered by FP3.

Table 3B: Specific programmes under EC FP4 + Euratom FP: All projects (contracts signed (1))
All types of project

Names of specific programmes under EC FP4 + Euratom FP	Number of projects under way at 31.12.97 (2)	Overall number of projects (3)	Total payments 1997 (ECU million)	Overall Community contribution (ECU million) (4)
Telematics applications	420	508	189.7	638.26
Communication technologies	145	154	150.02	477.80
Information technologies	1109	1762	380.71	1400.77
Industrial and materials technologies	1158	1802	320.33	1127.98
Standards, measurements & testing	290	402	30.91	120.75
Environment and climate	574	790	114.61	380.97
Marine science and technology	145	224	51.03	170.84
Biotechnology	433	739	83.69	424.12
Biomedicine and health	487	663	83.11	250.81
Agriculture and fisheries	614	940	88.28	445.37
Non-nuclear energy	1143	1371	155.07	725.91
Transport	218	244	66.82	224.17
Targeted socio-economic research	127	160	23.28	61.10
International cooperation	846	1756	93.18	297.36
Dissemination & utilization of the results	351	646	51.70	194.10
Training and mobility of researchers	2127	3016	104.18	556.73
Competitive S/T support			18.96	
Nuclear fission safety	215	251	27.66	132.42
Controlled thermonuclear fusion	213	529	154.41	547.00
TOTAL	10615	15957	2187.65	8176.45

(1) Except where a specific programme provides otherwise, a project includes the initial and any supplementary contracts.
(2) Projects under way at 31.12.1997: contracts signed before 1.1.1998 with a completion date for research work after 31.12.1997.
(3) Total number of projects since the beginning of the fourth framework programme, including those which have already been completed.
(4) Overall Community contribution over the whole duration of the framework programme (including supplementary contracts).

Table 4 : Calls for proposals evaluated by the Commission in 1997 by specific programme under EC FP4 + Euratom FP

Names of specific programmes (EC FP4 + Euratom FP) and areas of work programme	Notice No and OJ dates of calls for proposals	Number of proposals received	Number of eligible proposals	Proposals selected by the Commission (1)		
				Number	% of total eligible proposals	EC contribution (ECU million)
TELEMATICS APPLICATIONS						
Telematics applications (excluding telematics engineering and support activities)	C381/22 (17/12/96)	712	702	246	35	163.7
Educational multimedia	C381/18 (17/12/96)	Stage 1: 837	805	n/a (2)	n/a	n/a
		Stage 2: 107	106	47	44	22.1
Integrated applications for digital sites	C381/20 (17/12/96)	Stage 1: 79	76	n/a	n/a	n/a
		Stage 2: 26	26	24	92	50.8
Research networks	C84/5 (13/03/97)	Stage 1: 6	6	n/a	n/a	n/a
		Stage 2: 1	1	1	100	8.6
COMMUNICATION TECHNOLOGIES (ACTS)	C183/22 (17/06/97)	193	193	89	46	79.7
INFORMATION TECHNOLOGIES (ESPRIT)						
Open microprocessor systems initiative - Technologies for business processes - Integration in manufacturing - IT for mobility - Electronic commerce	C84/12 (15/03/97)	300	297	81	27	124.4
Technologies for components and subsystems - Long-term research - High-performance computing and networking		157	144	31	22	52.0
Software technologies: ESSI	C183/06 (17/06/97)	526	516	117	23	25.2
Software technologies - Multimedia systems - Long-term research - Open microprocessor systems initiative - Integration in manufacturing + satellite communications + information access - IT for learning and training in industry	C280/09 (16/09/97)	698	654	93	14	92.4
Technologies for components and subsystems - Multimedia systems - Long-term research - High-performance computing and networking		306	297	13	4	7.8
Accompanying measures and various tasks (open call), including measures for SMEs	C357/07 (15/12/94)	605	598	190	32	81.2
		271	252	74	29	4.5
INDUSTRIAL AND MATERIALS TECHNOLOGIES (Brite Euram)	C381/19 (17/12/96)	1140	1081	400	37	702.5
Thematic networks	C357/03 (15/12/94)	156	156	86	55	54.0
Accompanying measures	C357/03 (15/12/94)	90	90	67	74	2.2
Intelligent manufacturing systems	C117/15 (15/04/97)	1	1	1	100	4.4
Technology stimulation actions for SMEs	C357/03 (15/12/94)	840	729	436	60	74.6

(1) Including the reserve list, where appropriate.

(2) n/a: not applicable

Table 4 (continued): Calls for proposals evaluated by the Commission in 1997 by specific programme under EC FP4 + Euratom FP

Names of specific programmes (EC FP4 + Euratom FP) and areas of work programme	Notice No and OJ dates of calls for proposals	Number of proposals received	Number of eligible proposals	Proposals selected by the Commission (1)		
				Number	% of total eligible proposals	EC contribution (ECU million)
STANDARDS, MEASUREMENT AND TESTING						
Measurements for quality European products, including written standards for industry	C171/24 (15/06/96)	129	104	47	45	30,4
Measurements for quality European products, including written standards for industry	C171/23 (15/06/96)	22	22	12	55	7,7
Research related to written standards and technical support to trade; measurements related to the needs of society	C381/24 (17/12/96)	40	39	22	56	8,5
Thematic networks (open call)	C357/06 (15/12/94)	31	31	17	55	2,6
Accompanying measures (open call)	C148/06 (15/06/95)	56	56	36	64	2,9
Technology stimulation actions for SMEs (open call)	C357/06 (15/12/94)	100	86	39	45	3,1
ENVIRONMENT AND CLIMATE						
Research into the natural environment, environmental quality and global change - Environmental technologies - Space techniques applied to environmental monitoring and research (excluding Area 3.3 CEO) - Human dimension of environmental change	C271/18 (17/09/96)	1182	1177	291	25	203,0
ENRICH (European Network for Research in Global Change) in the fields of environment and climate, and marine science and technology						
First call	C306/09 (15/10/96)	62	61	20	33	2,0
Advanced study courses	C381/21 (17/12/96)	40	40	13	33	0,9
Space techniques applied to environmental monitoring and research (Area 3.3 Centre for Earth Observation)	C183/10 (17/06/97)	100	97	25	26	18,7
Space techniques applied to environmental monitoring and research (Area 3.2)	C183/11 (17/06/97)	23	23	7	30	13,6
Technology stimulation actions for SMEs (open call): exploratory awards	C381/21 (17/12/96)	111	107	44	41	1,8
Cooperative research	C271/18 (17/09/96)	9	9	9	100	3,5
MARINE SCIENCE AND TECHNOLOGY (MAST)						
Support initiatives	C075/05 (15/03/96)	11	11	8	73	5,3
Strategic marine research in coastal and shelf seas - Structure and dynamics of shelf ecosystems (Area B.1.2)	C110/10 (16/04/96)	26	26	5	19	6,5
Advanced study courses	C381/26 (17/12/96)	12	12	3	25	0,2
Marine science (Area A.1.1 only) - Strategic marine research (excluding areas B.1.2 and B.2.1) - Marine technology (Area C.2 only)	C183/15 (17/06/96)	37	32	7	22	12,5
Supporting initiatives (Area D.3 only)	C183/16 (17/06/97)	3	3	2	67	0,9
Technology stimulation actions for SMEs (open call)	C357/19 (11/06/97)	14	14	6	43	0,3

(1) Including the reserve list, where appropriate

Table 4 : Calls for proposals evaluated by the Commission in 1997 by specific programme under EC FP4 + Euratom FP

Names of specific programmes (EC FP4 + Euratom FP) and areas of work programme	Notice No and OJ dates of calls for proposals	Number of proposals received	Number of eligible proposals	Proposals selected by the Commission (1)		
				Number	% of total eligible proposals	EC contribution (ECU million)
BIOTECHNOLOGIE						
Cell factories - Genome analysis - Plant biotechnology - Immunology and trans-disease vaccinology - Structural biology - Pre-normative research - Biodiversity and social acceptance - Infrastructures - ELSA	C171/27 (15/06/96)	391	391	107	27	126.9
Training grants (open call)	C171/28 (15/06/96)	213	213	125	59	9.0
Training grants for advanced workshops (open call)	C381/25 (17/12/96)	3	3	1	33	0.05
Technology stimulation actions for SMEs (open call)	C240/09 (15/09/95)	55	55	36	65	1.4
BIOMEDICINE AND HEALTH (BIOMED)						
Cancer research - Research on cardiovascular diseases - Research on chronic diseases, ageing and age-related diseases - Research on occupational and environmental health - Rare diseases - Public Health research, including health services research - Research on biomedical ethics - Horizontal activity: ethical, legal and social aspects - Horizontal activity: demonstration	C271/08 (17/09/96)	1002	988	195	20	91.4
Joint call for transmissible spongiform encephalopathies	C134/07 (29/04/97)	39	39	13	33	13.0
Marie Curie research fellowships	C12/06 (17/01/95)	110	110	36	33	2.8
Technology stimulation actions for SMEs	C12/06 (17/01/95)	98	95	42	44	5.6
AGRICULTURE AND FISHERIES (including agri-industry, food technologies, forestry, fish-farming and rural development) (FAIR)						
Scaling-up and processing methodologies - Generic science and advanced technologies for nutricious foods	C171/14 (15/06/96)	264	252	76	30	59.2
Integrated production and processing chains - Agriculture, forestry and rural development - Concertation activities	C381/19 (15/12/96)	631	627	143	23	103.3
Transmissible spongiform encephalopathies	C381/17 (17/12/96)	24	18	8	44	8.8
Mobility and training fellowships (open call)	C357/10 (15/12/94)	272	272	99	36	8.5
Technology stimulation actions for SMEs (open call)	C357/19 (15/12/94)	227	218	109	50	17.9
NON-NUCLEAR ENERGY (JOULE-THERMIE)						
JOULE	C271/13 (17/09/96)	250	241	107	44	97.0
	C18/05 (17/01/97)	353	324	124	38	98.0
open call	C357/11 (15/12/94)	2	2	1	50	0.4
THERMIE type A: demonstration projects	C271/13 (17/09/96)	289	286	175	61	162.0
THERMIE type B: accompanying measures (open call)	C357/11 (15/12/94)	403	401	266	66	27.3
THERMIE type B: measures for SMEs	C357/11 (15/12/94)	57	56	27	48	1.1

(1) Including the reserve list, where appropriate

Table 4 (continued): Calls for proposals evaluated by the Commission in 1997 by specific programme under EC FP4 + Euratom FP

Names of specific programmes (EC FP4 + Euratom FP) and areas of work programme	Notice No and OJ dates of calls for proposals	Number of proposals received	Number of eligible proposals	Proposals selected by the Commission (1)		
				Number	% of total eligible proposals	EC contribution (ECU million)
TRANSPORT	C381/10 (17/12/96)					
Strategic research		28	24	11	46	8.0
Rail transport		14	13	7	54	4.3
Integrated transport chains		29	24	10	42	6.1
Air transport		32	31	11	35	8.0
Urban transport		43	41	10	24	7.4
Water-borne transport		70	65	29	45	15.8
Road transport		51	51	11	22	5.2
Accompanying measures		17	16	2	13	2.5
TARGETED SOCIO-ECONOMIC RESEARCH	C306/10 (15/10/96)	308	301	74	25	33.7
INTERNATIONAL COOPERATION (INCO)						
COPERNICUS	C117/14 (15/04/97)	1298	1248	304	24	69.0
Training (Fellowships Japan/Korea)	C38/08 (15/02/95)	101	98	79	81	4.9
Developing countries	C117/13 (15/04/97)	1020	790	236	30	11.7
DISSEMINATION AND OPTIMISATION OF RESULTS (Innovation)						
European networks and services (*)	C337/24 (15/12/95)	82	80	16	20	4.9
Network of innovation relay centres (**)	C12/08 (17/01/95)	52	52	52	100	23.7
Validation and technology transfer projects	C271/09 (17/09/96)	314	302	92	30	35.0
TRAINING AND MOBILITY OF RESEARCHERS						
Access to large-scale facilities (concerted actions)	C271/10 (17/09/96)	11	10	10	100	2.0
Research networks	C271/17 (17/09/96)	1071	1067	147	14	81.2
Accompanying measures (Euroconferences, summer schools and practical training courses)	C381/16 (17/12/96)	166	161	68	42	3.8
Marie Curie training grants	C271/12 (17/09/96)	2192	2050	553	27	48.9
	C84/07 (15/03/97)	2124	1979	511	26	44.6
NUCLEAR SAFETY	C12/03 (17/01/95) C38/10 (15/02/95) Corrigendum	16	16	11	69	1.6
	C12/03 (17/01/95) C38/10 (15/02/95) Corrigendum	50	50	26	52	3.0

(*) The call for proposals had two closing dates. This information concerns the last closing date, i.e. 13/9/96.

(**) The call was published in January 1995 for 2 years (ref. 95/C12 page 9 published on 17/1/95): this call concerns the extension for 2 years of the 52 centres selected in 1995.

(1) Including the reserve list, where appropriate.

Table 5A: Breakdown of the Community contribution (in ECU million) and number of participations by type of organisation: Specific programmes under EC FP4 + Euratom FP

Shared-cost actions (SCA) (1): new projects (contracts signed (2) in 1997)

	European Union															
Type of organisation	**LE(3)**		**SME(4)**		**REC (5)**		**EDU(6)**		**Other (7)**		**Int. Org. (8)**		**Third countries (9)**		**Total**	
Names of specific programmes (EC FP4 + Euratom FP)	**Comm. contrib. (M ECU)**	**Number of participations**	**Comm. contrib. (M ECU)**	**Number of participations**	**Comm. contrib. (M ECU)**	**Number of participations**	**Comm. contrib. (M ECU)**	**Number of participations**	**Comm. contrib. (M ECU)**	**Number of participations**	**Comm. contrib. (M ECU)**	**Number of participations**	**Comm. contrib. (M ECU)**	**Number of participations**	**Comm. contrib. (M ECU)**	**Number of participations**
Telematics applications	10.82	99	20.27	212	7.71	72	18.89	200	17.69	244	0.82	14	3.12	54	79.31	895
Communication technologies	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.46	7
Information technologies	167.46	570	69.10	368	48.03	176	47.94	216	14.57	112	0.33	1	7.96	84	355.39	1527
Industrial and materials technologies	154.16	944	106.03	1,769	88.62	674	115.50	748	10.09	76	0.19	1	7.52	127	482.11	4339
Standards, measurements and testing	5.78	100	9.84	227	14.20	274	8.73	111	0.87	25	0.11	1	0.14	29	39.67	767
Environment and climate	1.83	15	8.49	78	47.37	372	51.65	375	1.07	18	0.53	8	5.18	87	116.12	953
Marine science and technology	1.50	8	6.98	52	13.57	74	22.92	99	0.26	5	0.00	0	1.80	19	47.03	257
Biotechnology	5.05	46	10.15	130	37.88	182	58.10	251	1.32	12	2.80	9	1.84	33	117.14	663
Biomedicine and health	2.16	23	6.41	107	20.22	160	44.00	318	3.91	28	0.72	4	1.72	29	79.14	669
Agriculture and fisheries	5.25	61	12.21	328	44.44	272	58.06	314	2.73	19	0.17	1	1.99	37	124.84	1032
Non-nuclear energy	83.75	281	69.58	521	26.96	202	27.94	176	21.96	123	0.00	0	8.16	79	238.35	1382
Transport	12.85	170	18.38	242	11.25	115	10.80	137	5.09	91	0.31	7	1.98	76	60.67	838
Targeted socio-economic research	0.00	0	0.53	7	8.40	91	24.58	281	1.64	34	0.14	1	1.77	28	37.06	442
International cooperation	0.93	26	2.64	59	20.52	307	35.54	483	1.11	27	0.27	6	67.22	1110	128.23	2018
Dissemination and utilization of the results	1.71	30	6.16	205	1.87	52	2.20	61	7.08	76	0.09	5	0.34	14	19.45	443
Training and mobility of researchers	3.91	30	2.54	22	43.11	367	113.19	994	0.27	3	2.73	24	2.98	47	168.73	1487
Nuclear fission safety	0.13	4	0.29	7	0.48	16	0.09	3	0.00	0	0.00	0	0.00	0	0.99	30
Controlled thermonuclear fusion	2.27	4	2.81	4	37.28	96	0.32	9	7.23	31	63.91	2	0.60	5	114.42	151
TOTAL RESEARCH	459.56	2411.00	352.40	4338	471.91	3502	640.46	4776	96.89	924	73.12	84	114.32	1858	**2209.11**	**17900**

(1) On account of their nature, some special measures are attached to the shared-cost actions.
(2) Contracts signed in 1997, whether or not amended by supplementary contracts signed in 1997: contracts signed in 1995 and 1996 which have been amended by supplementary contracts signed in 1997 are not included.
(3) LE: Large enterprises.
(4) SME: enterprises which have fewer than 500 employees, not more than a third of whose capital is controlled by a large enterprise and with a turnover not exceeding ECU 38 million (ECU 50 million for information technologies).
(5) REC: Research bodies (private/public/mixed), including the JRC.
(6) EDU: Higher education institutes.
(7) Other: EIG, EEIG, non-profit-making bodies, etc.
(8) Int. Org.: International organizations.
(9) Third countries: countries not belonging to the European Union.

Table 5B: Share (%) of the Community contribution and of the participations by type of organisation: Specific programmes under EC FP4 + Euratom FP

Shared-cost actions (SCA) (1): new projects (contracts signed (2) in 1997)

	European Union															
Type of organisation	**LE(3)**		**SME(4)**		**REC (5)**		**EDU(6)**		**Other (7)**		**Int. Org. (8)**		**Third countries (9)**		**Total**	
Names of specific programmes (EC FP4 + Euratom FP)	**Comm. contrib.**	**Participations**	**Comm. contrib.**	**Participations**	**Comm. contrib.**	**Participations**	**Comm. contrib.**	**Participations**	**Comm. contrib.**	**Participations**	**Comm. contrib.**	**Participations**	**Comm. contrib.**	**Participations**	**Comm. contrib.**	**Participations**
Telematics applications	13.64	11.06	25.55	23.69	9.72	8.04	23.82	22.35	22.30	27.26	1.03	1.56	3.94	6.03	100.00	100
Communication technologies	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Information technologies	47.12	37.33	19.44	24.10	13.51	11.53	13.49	14.15	4.10	7.33	0.09	0.07	2.24	5.50	100.00	100
Industrial and materials technologies	31.98	21.76	21.99	40.77	18.38	15.53	23.96	17.24	2.09	1.75	0.04	0.02	1.56	2.93	100.00	100
Standards, measurements and testing	14.57	13.04	24.80	29.60	35.80	35.72	22.01	14.47	2.19	3.26	0.28	0.13	0.35	3.78	100.00	100
Environment and climate	1.58	1.57	7.31	8.18	40.79	39.03	44.48	39.35	0.92	1.89	0.46	0.84	4.46	9.13	100.00	100
Marine science and technology	3.19	3.11	14.84	20.23	28.85	28.79	48.73	38.52	0.55	1.95	0.00	0.00	3.83	7.39	100.00	100
Biotechnology	4.31	6.94	8.66	19.61	32.34	27.45	49.60	37.86	1.13	1.81	2.39	1.36	1.57	4.98	100.00	100
Biomedicine and health	2.73	3.44	8.10	15.99	25.55	23.92	55.60	47.53	4.94	4.19	0.91	0.60	2.17	4.33	100.00	100
Agriculture and fisheries	4.21	5.91	9.78	31.78	35.59	26.36	46.51	30.43	2.19	1.84	0.14	0.10	1.59	3.59	100.00	100
Non-nuclear energy	35.14	20.33	29.19	37.70	11.31	14.62	11.72	12.74	9.21	8.90	0.00	0.00	3.42	5.72	100.00	100
Transport	21.19	20.29	30.30	28.88	18.55	13.72	17.81	16.35	8.40	10.86	0.51	0.84	3.26	9.07	100.00	100
Targeted socio-economic research	0.00	0.00	1.43	1.58	22.67	20.59	66.32	63.57	4.43	7.69	0.38	0.23	4.78	6.33	100.00	100
International cooperation	0.73	1.29	2.06	2.92	16.00	15.21	27.72	23.93	0.87	1.34	0.21	0.30	52.42	55.00	100.00	100
Dissemination and utilization of the results	8.79	6.77	31.67	46.28	9.61	11.74	11.31	13.77	36.40	17.16	0.46	1.13	1.75	3.16	100.00	100
Training and mobility of researchers	2.32	2.02	1.50	1.48	25.55	24.68	67.09	66.85	0.16	0.20	1.62	1.61	1.77	3.16	100.00	100
Nuclear fission safety	13.13	13.33	29.29	23.33	48.48	53.33	9.09	10.00	0.00	0.00	0.00	0.00	0.00	0.00	100.00	100
Controlled thermonuclear fusion	1.98	2.65	2.46	2.65	32.58	63.58	0.28	5.96	6.32	20.53	55.86	1.32	0.52	3.31	100.00	100
TOTAL RESEARCH	20.81	13.47	15.96	24.24	21.37	19.57	29.00	26.69	4.39	5.16	3.31	0.47	5.18	10.38	100.00	100

(1) On account of their nature, some special measures are attached to the shared-cost actions.
(2) Contracts signed in 1997, whether or not amended by supplementary contracts signed in 1997: contracts signed in 1995 and 1996 which have been amended by supplementary contracts signed in 1997 are not included.
(3) LE: Large enterprises.
(4) SME: enterprises which have fewer than 500 employees, not more than a third of whose capital is controlled by a large enterprise and with a turnover not exceeding ECU 38 million (ECU 50 million for information technologies).
(5) REC: Research bodies (private/public/mixed), including the JRC.
(6) EDU: Higher education institutes.
(7) Other: EIG, EEIG, non-profit-making bodies, etc.
(8) Int. Org.: International organizations.
(9) Third countries: countries not belonging to the European Union.

Table 6: Access to European research for Objective 1 regions: Specific programmes under EC FP4 + Euratom FP

Shared-cost actions (SCA) (1); New Projects (contracts signed (2) in 1997)

Names of specific programmes (EC FP4 + Euratom FP)	Number of projects (3)			Number of participations (4)			Total Community contribution to the projects (ECU million) (5)		
		Total	Objective 1		Total	Objective 1		Total	Objective 1
Telematics applications		73	35		895	122		79,31	41,01
Communication technologies		1	n/a		7	n/a		0,46	n/a
Information technologies		262	115		1527	178		355,39	182,68
Industrial and materials technologies		801	319		4339	588		482,11	283,21
Standards, measurements and testing		136	48		767	70		39,67	20,04
Environment and climate		165	75		953	113		116,12	55,84
Marine science and technology		43	27		257	53		47,03	33,88
Biotechnology		128	57		663	66		117,14	61,43
Biomedicine and health		128	40		669	46		79,14	28,88
Agriculture and fisheries (DG VI and XII)	(165)	214	(56)	(824)	1032	(83)	(101,79)	124,84	(44,71)
Non-nuclear energy		329	121		1382	175		238,35	90,87
Transport		85	51		838	96		60,67	36,75
Targeted socio-economic research		65	46		442	75		37,06	27,39
International cooperation		351	88		2018	284		128,23	33,96
Dissemination and utilization of the results		107	49		443	79		19,45	7,50
Training and mobility of researchers		1047	170		1487	203		168,73	77,54
Nuclear fission safety		3	1		30	1		0,99	0,20
Controlled thermonuclear fusion		134	4		151	6		114,42	0,13
TOTAL DISTRIBUTED		4.022	1302		17.685	2238		2185,60	1026,02
TOTAL RESEARCH		4.072			17.900			2.209,11	

(1) On account of their nature, some special measures are attached to the shared-cost actions.

(2) Contracts signed in 1997, whether or not amended by supplementary contracts signed in 1997; contracts signed in 1995 and 1996 which have been amended by supplementary contracts signed in 1997 are not included.

(3) Total number of projects, and number of projects with at least one participant based in an "Objective 1" region.

(4) Total number of participations, and number of participations by participants based in "Objective 1" regions.

(5) Total Community contribution to all projects, and to projects with at least one participant in an "Objective 1" region.

Table 7: Intra-country and inter-country collaboration links (3), excluding international organisations (4): Specific programmes under EC FP4 + Euratom FP

Shared-cost actions (SCA) (1); New projects (contracts signed in 1997 (2))

	Belgium	Denmark	Germany	Greece	Spain	France	Ireland	Italy	Luxemb.	Netherlands	Austria	Portugal	Finland	Sweden	United Kingdom	TOTAL EUR 15	Liechtens.	Iceland	Norway	Israel	Switzerland	Rest of the world	TOTAL
Belgium	313	150	764	171	330	839	96	439	35	483	123	141	184	269	871	**5.208**	5	10	105	25	66	269	**5.688**
Denmark	150	186	517	116	219	366	71	307	14	272	106	85	155	252	616	**3.432**	3	15	177	15	54	113	**3.809**
Germany	764	517	1.837	520	1.087	2.504	241	1.769	49	1.376	506	349	574	938	2.958	**15.989**	5	26	418	86	332	652	**17.508**
Greece	171	116	520	220	324	489	61	508	15	240	96	165	140	139	676	**3.880**	2	13	122	18	49	226	**4.310**
Spain	330	219	1.087	324	701	987	130	1.105	13	446	143	437	214	480	1.479	**8.095**	3	20	149	26	75	206	**8.574**
France	839	366	2.504	489	987	1.543	224	1.644	39	998	219	351	307	670	2.603	**13.783**	3	17	275	83	237	615	**15.013**
Ireland	96	71	241	61	130	224	45	168	4	120	54	62	47	114	430	**1.867**	0	8	66	10	22	67	**2.040**
Italy	439	307	1.769	508	1.105	1.644	168	927	24	643	238	336	274	517	1.766	**10.665**	5	10	173	52	150	427	**11.482**
Luxembourg	35	14	49	15	13	39	4	24	4	9	14	9	7	17	34	**287**	0	1	23	0	8	7	**326**
Netherlands	483	272	1.376	240	446	998	120	643	9	606	183	176	276	414	1.448	**7.690**	1	28	212	38	120	295	**8.384**
Austria	123	106	506	96	143	219	54	238	14	183	137	70	90	128	311	**2.418**	2	10	45	6	62	98	**2.641**
Portugal	141	85	349	165	437	351	62	336	9	176	70	211	105	124	535	**3.156**	1	16	79	10	42	131	**3.435**
Finland	184	155	574	140	214	307	47	274	7	276	90	105	244	281	581	**3.479**	1	11	145	3	43	164	**3.846**
Sweden	269	252	938	139	480	670	114	517	17	414	128	124	281	404	1.155	**5.902**	3	31	216	14	81	175	**6.422**
United Kingdom	871	616	2.958	676	1.479	2.603	430	1.766	34	1.448	311	535	581	1.155	2.132	**17.595**	5	34	583	67	266	786	**19.336**
Total EUR15	**5.208**	**3.432**	**15.989**	**3.880**	**8.095**	**13.783**	**1.867**	**10.665**	**287**	**7.690**	**2.418**	**3.156**	**3.479**	**5.902**	**17.595**	**56.478**	**39**	**250**	**2.788**	**453**	**1.607**	**4.231**	
Liechtenstein	5	3	5	2	3	3	0	5	0	1	2	1	1	3	5	**39**	0	0	1	0	0	1	**41**
Iceland	10	15	26	13	20	17	8	19	1	28	10	16	11	31	34	**250**	0	16	23	0	4	3	**296**
Norway	105	177	418	122	149	275	66	173	23	212	45	79	145	216	583	**2.788**	1	23	193	4	23	56	**3.088**
Israel	25	15	80	18	26	83	10	52	0	38	6	10	3	14	67	**453**	0	0	4	22	9	31	**519**
Switzerland	66	54	332	49	75	237	22	150	8	120	62	42	43	81	266	**1.607**	0	4	23	9	33	33	**1.709**
Rest of the world	269	113	652	226	206	615	67	427	7	295	98	131	164	175	786	**4.231**	1	3	56	31	33	3.015	**7.370**
GRAND TOTAL	**5.688**	**3.809**	**17.508**	**4.310**	**8.574**	**15.013**	**2.040**	**11.482**	**326**	**8.384**	**2.641**	**3.435**	**3.846**	**6.422**	**19.336**		**41**	**296**	**3.088**	**519**	**1.709**	**7.370**	**65.846**

(1) On account of their nature, some special measures are attached to the shared-cost actions

(2) Contracts signed in 1997 not amended by supplementary contracts signed in 1997; contracts signed in 1995 and 1996 which have been amended by supplementary contracts signed in 1997 are not included.

(3) A collaboration link between 2 participants from the same country is counted once only. A collaboration link between 2 different countries is counted twice, once for each country.

Counting each intra-EU link once only gives a total of 56 478 links for the whole of the European Union (the boxes between the thick line and the EUR 15 line).

Counting each intra-EEA link once only gives a total of 59 788 links for the whole of the European Economic Area (the boxes below the thick line for members of the EEA).

Counting each intra-FU and extra-FU link once only gives a total of 65 846 links for all countries (all boxes below the thick line).

(4) The JRC (cf (5), tables 5A and 5B) is included under the address of the centre carrying out the research, as the host Member State benefits indirectly from hosting the JRC centre.

A further 421 collaboration links with international organisations (IO) other than the JRC (links between two IOs or between an IO and a country) are not included in this table.

Table 8 : 1998 timetable for calls for proposals and the selection procedure; Budget

Specific programmes under EC FP4 + Euratom FP

Names of specific programmes (EC FP4 + Euratom FP) and areas of work programme	Dates and OJ references of calls for proposals (or expressions of interest)	Deadlines/dates for receipt of proposals	Evaluation period	Contract negotiation period	Anticipated date of signature of first contracts	Total 1998 Budget (ECU million)
Telematics applications						
Communication technologies (ACTS)						
Information technology (ESPRIT)						
Call in 1 stage in the following fields: technologies for components and subsystems (TCS), high performance computing and networking (HPCN), integration in manufacturing (IiM)	17/3/98 C 82	30-Jun-98	July-September	September-October	September	32.4
Industrial and materials technologies (Brite-EuRam)						
Thematic networks (9th series, exploratory stage and implementation stage)	15/12/94 C 357	31-Dec-97	February	April	June	12.0
Technology stimulation actions for SME (10th series, cooperative research)	15/12/94 C 357	31-Dec-97	January	February	April	32.0
Technology stimulation actions for SME (11th series, cooperative research)	15/12/94 C 357	30-Apr-98	May	June	September	70.0
Accompanying measures	15/12/94 C 357	20-May-98	In 1998	In 1998	In 1998	30.0
Standards, measurements and testing						
Call for research related to written standards and technical support to trade; measurements related to the needs of society	17/06/1997 C 183	27-Nov-97	January-February	May-June	July	13.5
6th targeted call (CEN, ETSI, CENELEC) for support for Union policies	17/06/1997 C 183	27-Nov-97	January-February	May-June	July	5.0
Open call for thematic network projects	15/12/94 C 357	17-Dec-97	January-February	May-June	July	3.0
Accompanying, preparatory and support measures	15/06/95 C 148	23-Jan-98	January-February	May-June	July	1.7
		30-Jul-98	September	October-November	November	
Technology stimulation actions for SME (cooperative research)	15/12/94 C 357	11-Dec-97	January	April-May	June	7.3
		08-Apr-98	May	September-October	October	

Table 8 (continued) : 1998 timetable for calls for proposals and the selection procedure; Budget

Specific programmes under EC FP4 + Euratom FP

Names of specific programmes (EC FP4 + Euratom FP) and areas of work programme	Dates and OJ references of calls for proposals (or expressions of interest)	Deadlines/dates for receipt of proposals	Evaluation period	Contract negotiation period	Anticipated date of signature of first contracts	Total 1998 Budget (ECU million)
Environment & Climate						
ENRICH (European Network for Research in Global Change) in the fields of the environment, climate, and marine science and technology	16/9/97 C 280	16-Dec-97	February-June	July-September	July	1.8
Water use and water management in the fields of the industrial and materials technologies programme and the environment and climate programme	31/10/97 C 329	02-Feb-98	March-June	July-October	September	10.0
Advanced study courses	31/10/97 C 381	16-Mar-98	March-July	August-November	December	0.8
Training grants	15/12/95 C 337	20/03/98 August 98	April-September	June-November	June-November	3.8
Technology stimulation actions for SME (cooperative research)	31/10/97 C 271	01-Apr-98	February	June	July	2.6
Marine science and technology (MAST)						
Supporting initiatives	17/06/97 C 183	12-Jun-98	June-July	September- October	December	0.9
Training grants	17/12/96 C 381	20-Aug-98	September	October-November	December	0.2
Biotechnology						
Cell factories; genome analysis; plant biotechnology; cell communication in neurosciences; immunology and trans-disease vaccinology; structural biology; pre-normative research, biodiversity and social acceptance; infrastructures; ELSA	17/06/1997 C 183	15-Oct-97	November-March	May-September	July	137.9
Joint call for transmissible spongiform encephalopathies	29/04/1997 C 134	30-Jul-97	July-February	March	April	6.6
Biomedicine and health (BIOMED)						
Joint call for transmissible spongiform encephalopathies	29/04/1997 C 134	15-Jul-97	July	March-April	May-June	12.0
Technology stimulation actions for SME (cooperative research projects)	17/01/95 C 12	January	January	May-June	September	2.1
Marie Curie research fellowships	17/01/95 C 12	31-Dec-97	May	June-July	October	5.5
Technology stimulation actions for SME (cooperative research projects)	29/04/1997 C 134	April	May	September	November-December	

Table 8 (continued) : 1998 timetable for calls for proposals and the selection procedure; Budget

Specific programmes under EC FP4 + Euratom FP

Names of specific programmes (EC FP4 + Euratom FP) and areas of work programme	Dates and OJ references of calls for proposals (or expressions of interest)	Deadlines/dates for receipt of proposals	Evaluation period	Contract negotiation period	Anticipated date of signature of first contracts	Total 1998 Budget (ECU million)
Agriculture and Fisheries (FAIR)						
Generic science and advanced technologies for nutritious foods, agriculture, forestry and rural development, fisheries and fish-farming	15/10/97 C 313	16-Jan-98	March-June	June-November	September	160.0
Technology stimulation actions for SME (exploratory awards); open call for cooperative research	15/12/94 C 357	15-Dec-97	January-March	April-July	June	7.0
		08-Apr-98	May-June	July-November	October	10.0
Call for transmissible spongiform encephalopathies	17/03/1998 C 134	17-Jun-98	June-September	September-November	November	2.7
Marie Curie research fellowships	15/12/94 C 357	15-Dec-97	February-April	May-June	June	2.5
Non-nuclear energy (JOULE-THERMIE)						
JOULE: technology stimulation actions for SME (exploratory awards restricted to cooperative research projects)	15/12/94 C 357	08-Apr-98	May	September	December	
JOULE: training grants	15/6/96 C 171	01-Jul-98	July	October	January	0.8
THERMIE: preparatory, accompanying and support measures (development and implementation of specific energy RTD strategies; dissemination of energy technologies; concerted actions and concerted networks; measures for SME)	15/12/94 C 357	17-Dec-97	January-February	May-June	September	14.0
THERMIE: Demonstration projects in the fields of the rational use of energy, renewable sources of energy, and fossil fuels	16/9/97 C 280	30-Jan-98	February-March	May-June	September	96.0
Transport						
Air transport, road transport, measures to consolidate the results of transport research under the 4th FP, measures/studies targeted on policy issues, tasks preparing for future activities in the field of transport research	16/12/97 C 381	16-Mar-98	April	July-December	September	12.0
Intermodal transport: demonstration projects in the field of freight and passenger transport	16/12/97 C 381	16-Mar-98	April	July-December	September	12.0

Table 8 (continued) : 1998 timetable for calls for proposals and the selection procedure; Budget

Specific programmes under EC FP4 + Euratom FP

Names of specific programmes (EC FP4 + Euratom FP) and areas of work programme	Dates and OJ references of calls for proposals (or expressions of interest)	Deadlines/dates for receipt of proposals	Evaluation period	Contract negotiation period	Anticipated date of signature of first contracts	Total 1998 Budget (ECU million)
Targeted socio-economic research						
Science and technology policy options, research on education and training, research on integration and social exclusion (certain sub-areas only)	16/9/97 C 280	15-Jan-98	January-May	June-September	September	30.0
International cooperation (INCO)						
INCO-COPERNICUS: cooperation with the countries of Central and Eastern Europe and the newly independent States (DGs III, XII, XIII, XVII)	15/04/97	10-Oct-97	November	March	June	7.3
Dissemination and optimisation of the results (INNOVATION)						
Validation and technology transfer projects	17/6/97 C 183	06-Oct-97	January	February-March	April	18.0
European networks and services	16/9/97 C 280	15-Dec-97	January-March	April-May	May	5.5
Regional measures	16/9/97 C 280	15-Dec-97	January	April-May	May	11.5
Training and mobility of researchers						
Access to large-scale facilities	15/03/1997 C 84	16-Jun-97	July-August 97	January-March	March	40.0
Accompanying measures (Euroconferences, summer schools, training courses)	17/6/97 C 183	30-Sep-97	October-March		March	4.8
Accompanying measures (Euroconferences, summer schools, training courses)	16/12/97 C 381	31-Mar-98	April-September		September	4.8
Training through research	16/9/97 C 280	15-Dec-97	February-March		June	54.0
Nuclear fission safety						
Concerted actions	17/1/95 C 12	01-Nov-97	December-March 98	April-June 98	Jul-98	3.0

Table 9: Funding of the Fourth EC Framework Programme and of the Euratom Framework Programme (ECU million)

(including decisions on enlargement and additional funding)

	Fourth Framework Programme Decisions 1110/94/EC, 616/96/EC 2535/97/EC			Euratom Framework Programme Decisions 94/268, 96/253/Euratom		TOTAL	
	Indirect actions	JRC	Support for DGs	Indirect actions	JRC		
FIRST ACTIVITY Research, technological development and demonstration activities	**9425**	**639**	**96**				
Information and communication technologies	**3 646**	**11.5**	**10.5**				**3668**
1. Telematics applications	913					913	
2. Communications technologies	671					671	
3. Information technologies	2 062	11.5	10.5			2084	
Industrial technologies	**1921**	**208.5**	**10.5**				**2140**
4. Industrial and materials technologies	1737	96				1833	
5. Measurement and testing	184	112.5	10.5			307	
Environment	**816.5**	**313**	**27.5**				**1157**
6. Environment and climate	573.5	313	27.5			914	
7. Marine science and technology	243					243	
Life sciences and technologies	**1627.5**	**50**	**31.5**				**1709**
8. Biotechnology	595.5					595.5	
9. Biomedicine and health	374					374	
10. Agriculture and fisheries	658	50	31.5			739.5	
Energy	**1039**	**21**	**16**	**1 016,5**	**319.5**		**2412**
11. Non-nuclear energy	1039	21	16			1076	
12. Nuclear fission safety				170.5	270.5	441	
13. Controlled thermonuclear fusion				846	49	895	
14. Transport	**263**						**263**
15. Targeted socio-economic research	**112**	**35**					**147**
SECOND ACTIVITY Cooperation with third countries and international organisations	**575**						**575**
THIRD ACTIVITY Dissemination and utilisation of results	**312**		**40**				**352**
FOURTH ACTIVITY Stimulation of the training and mobility of researchers	**792**						**792**
TOTAL	**11104**	**639**	**136**	**1 016,5**	**319.5**		
MAXIMUM OVERALL AMOUNT	**11879**			**1 336**			**13215**

Table 10: Development of Community research commitments
Period 1984 - 1998

(ECU million, current prices)

Situation at 01.05.98

YEARS	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998 (2)	TOTAL
1984-87 FP	593.0	735.0	874.0	701.8	260.8	101.1	4.9									3270.6
1987-91 FP				188.1	810.6	1241.3	1596.9	1270.7	230.9	14.8	3.9	0.2				5357.4
1990-94 FP								296.0	2160.5	1929.5	1264.7	1.0				5651.7
90-94 FP additional funding										150.0	750.0					900.0
1994-98 FP (*)											0.0	3017.5	3201.5	3485.4	3491.0	13195.4
RTD PROGRAMMES	593.0	735.0	874.0	889.9	1071.4	1342.4	1601.8	1566.7	2391.4	2094.3	2018.6	3018.7	3201.5	3485.4	3491.0	28375.1
APAS				49.4	56.6	69.8	113.1	168.8	308.4	440.2	571.8	2.1				1780.2
RTD+APAS	593.0	735.0	874.0	939.3	1128.0	1412.2	1714.9	1735.5	2699.8	2534.5	2590.4	3020.8	3201.5	3485.4	3491.0	30155.3
SPRINT							16.0	16.0	17.0							49.0
ECSC							17.5	17.5	17.5	17.5	17.5					87.5
80% of THERMIE							36.0	118.4	128.9	139.2	145.6					568.1
Total for all research (1)	593.0	735.0	874.0	939.3	1128.0	1412.2	1784.4	1887.4	2863.2	2691.2	2753.5	3020.8	3201.5	3485.4	3491.0	30859.9

4269.3 i.e. 2.42% of the budget

7151 i.e. 3.18% of the budget

11980 i.e. 4.05% of the budget

15952 i.e. 3.98% of the budget

EC budget (current prices)	28905	29925	35842	38392	43080	42569	45057	56111	61232	67760	65929	75355	82125	87651	89503
Total research as % of budget	2.1	2.5	2.4	2.4	2.6	3.3	4.0	3.4	4.7	4.0	4.2	4.0	3.9	4.0	3.9

(*) The amounts of the 1994-1998 FP are those adopted following EU enlargement.

(1) RTD + THERMIE + ECSC + SPRINT + APAS.

(2) Budget for 1998.

Table 11: Development of Community research commitments

Period 1984 - 1998

(ECU million - 1992 prices)

Situation at 01.05.98

YEARS	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998 (2)	TOTAL
1984-87 FP	848.4	991.9	1139.5	886.1	317.7	117.1	5.4									4306.1
1987-91 FP				237.5	987.3	1438.4	1770.4	1339.0	230.9	14.6	3.8	0.2				6022.1
1990-94 FP								311.9	2160.5	1901.0	1224.3	1.0				5598.7
90-94 FP additional funding										147.8	726.0					873.8
1994-98 FP (*)											0.0	2887.6	2969.9	3148.5	3092.1	12098.1
RTD PROGRAMMES	848.4	991.9	1139.5	1123.6	1305.0	1555.5	1775.8	1650.9	2391.4	2063.4	1954.1	2888.8	2969.9	3148.5	3092.1	28898.8
APAS				62.4	68.9	80.9	125.4	177.9	308.4	433.7	553.5	2.0				1813.1
RTD+APAS	848.4	991.9	1139.5	1186.0	1373.9	1636.4	1901.2	1828.8	2699.8	2497.1	2507.6	2890.8	2969.9	3148.5	3092.1	30711.9
SPRINT							17.7	16.9	17.0							51.6
ECSC							19.4	18.4	17.5	17.2	16.9					89.4
80% of THERMIE							39.9	124.8	128.9	137.1	140.9					571.6
Total for all research (1)	848.4	991.9	1139.5	1186.0	1373.9	1636.4	1978.2	1988.9	2863.2	2651.4	2665.4	2890.8	2969.9	3148.5	3092.1	31424.5

5539.7 i.e. 2.41% of the budget

8163 i.e. 3.15% of the budget

12147 i.e. 4.04% of the budget

14767 i.e. 3.98% of the budget

EC budget (1992 prices)	41352	40385	46730	48475	52473	49327	49952	59126	61232	66759	63823	72110	76183	79179	79276
Total research as % of budget	2.1	2.5	2.4	2.4	2.6	3.3	4.0	3.4	4.7	4.0	4.2	4.0	3.9	4.0	3.9
Deflation factors (**)	0.699	0.741	0.767	0.792	0.821	0.863	0.902	0.949	1.000	1.015	1.033	1.045	1.078	1.107	1.129
Annual inflation (%)		6.0	3.5	3.3	3.6	5.1	4.5	5.2	3.5	1.5	1.8	1.2	3.2	2.7	2.0

(*) The amounts of the 1994-1998 FP are those adopted following EU enlargement.

(**) The deflation factors used from 1995 take account of the enlargement of the Union from to 15 Member States (COM(96)65).

(1) RTD + THERMIE + ECSC + SPRINT + APAS.

(2) Budget for 1998.

ANNEX III

Main reports relating to Community Research Activities

1. Main documents relevant to the current Community RTD activities issued by the European Commission:

- Five-Year Assessment Reports of:
  - (i) *The Fourth RTD Framework Programme/Euratom Framework Programme* (1994-1998), EUR 17644 (1997); and
  - (ii) Specific Programmes:
    Telematics Applications, EUR 17603 (1997)
    Advanced Communication Technologies and Services, EUR 17602 (1997)
    Information Technologies (ESPRIT), EUR 17601 (1997)
    Industrial and Materials Technologies, EUR 17587 (1997)
    Measurements and Testing, EUR 17588 (1997)
    Environment and Climate, EUR 17589 (1997)
    Marine Sciences and Technologies, EUR 17590 (1997)
    Biotechnology, EUR 17591 (1997)
    Biomedicine and Health, EUR 17592 (1997)
    Agriculture and Fisheries, including Agro-Industry, Food Technologies, Forestry, Aquaculture and Rural Development, EUR 17593 (1997)
    Non-Nuclear Energy, EUR 17594 (1997)
    Transport, EUR 17595 (1997)
    Targeted Socio-Economic Research, EUR 17596 (1997)
    Cooperation with Third Countries and International Organisations, EUR 17597 (1997)
    Dissemination and Optimisation of Results (Innovation), EUR 17600 (1997)
    Stimulation of Training and Mobility of Researchers, EUR 17598 (1997)
    Nuclear Fission Safety, EUR 17599 (1997)
    Controlled Thermonuclear Fusion, EUR 17521 (1996)

  (In addition, Annual Monitoring Reports have been produced for all the above-mentioned Programmes, for the years 1995, 1996 and 1997.)

- *Joint Research Centre: 1997 Annual Report* (forthcoming)
- *Evaluation of the Joint Research Centre 1992-1996*, Communication from the Commission, COM(97) 164 final.
- *Commission's Responses to the Recommendations of the Independent External Assessments of the Last Five Years of Activities in the Domains covered by the Specific Programmes and the JRC Institutes under the Fourth Framework Programme and Euratom Framework Programme, Communication from the Commission*, COM(97) 149 final.
- *Second European Report on S&T Indicators 1997*, EUR 17639 (1997).
- *Research and development : annual statistics 1997 – Eurostat, 9c – CA-06-97-416-3AC*

2. Most recent main annual budgetary documents of relevence to Community RTD activities:

- *Preliminary Draft General Budget for the Financial Year 1998*, Volume 4, COM(97) 280.
- *General Budget for the Financial Year 1998*, L 44, Volume 41 (16 Feb. 1998).
- *Revenue and Expenditure Account and Balance Sheet, Relating to Operations under the 1997 Budget*, SEC(98) 519.
- *Vademecum Budgetaire*, which provides a time series of research payments from the year 1958, SEC(97) 1200.

Main acronyms and abbreviations used

ACP	African, Caribbean and Pacific countries
ACTS	Advanced Communications Technologies and Services
AIDS	Acquired Immuno-Deficiency Syndrome
APAS	Accompanying, Preparatory And Support measures
ATM	Asynchronous Transfer Mode
BIOMED	BIOMEDicine and health (specific RTD programme)
BRITE-EURAM	Basic Research in Industrial Technologies for Europe - EUropean Research in Advanced Materials (specific RTD programme under FP3)
BSE	Bovine Spongiform Encephalopathies
CAD	Computer Assisted Design
CAM	Computer Assisted Manufacturing
CAP	Common Agricultural Policy
CCFP	Consultative Committee for the Fusion Programme
CEECs	Central and Eastern European countries
CEN	European Committee for Standardization
CENELEC	European Committee for Electrotechnical Standardization
CERN	European Centre for Nuclear Research
CIS	Commonwealth of Independent States of the former Soviet Union
CJD	Creutzfeld Jacob Disease
CNES	Centre National des Etudes Spatiales (France)
COPERNICUS	Cooperation in science and technology with Central and Eastern Europe
CORDIS	Community Research and Development Information Service
COST	European COoperation in the field of Scientific and Technical research
CRAFT	Cooperative Research Action for Technology
CREST	Scientific and Technical Research Committee (advises the Commission)
DCs	Developing Countries
EAEC	European Atomic Energy Community
EBRD	European Bank for Reconstruction and Development
EC	European Community
ECHO	European Community Humanitarian Office
ECSC	European Coal and Steel Community
EEA	European Economic Area
EFTA	European Free Trade Association
ESSI	European Systems and Software Initiative
ESTA	European Science and Technology Assembly
EMBL	European Molecular Biology Laboratory
ESA	European Space Agency
ESF	European Science Foundation
ESPRIT	European Strategic Programme for Research and Development in Information Technologies
ETAN	European Technology Assessment Network
ETSI	European Telecommunications Standards Institute
EU	European Union
EUREKA	Framework for European technological cooperation
EURATOM	European Atomic Energy Community
EURET	European REsearch for Transport (specific RTD programme under FP2)
FNR	Fast Neutron Reactor
FP	Framework Programme
FUSE	First User Experiments
HCM	Human Capital and Mobility (specific RTD programme under FP3)

HPCN	High Performance Computing and Networking
IiM	Integration in Manufacturing
IEA	International Energy Agency
IMT	Industrial and Materials Technologies
IPTS	Institute for Prospective Technological Studies (JRC, Seville)
IRDAC	Industrial Research and Development Advisory Committee
ISPO	Information Society Project Office
IST	Information Society Technologies
ISTC	International Science and Technology Centre (Moscow)
IT	Information Technologies
ITEA	Information Technologies European Awards
ITER	International Thermonuclear Experimental Reactor
JET	Joint European Torus
JOULE	Joint Opportunities for Unconventional or Long-term Energy supply (specific RTD programme)
JRC	Joint Research Centre
LFR	Less Favoured Region
LWR	Light Water Reactor
MAST	MArine Science and Technology (specific RTD programme)
MEDA	Measures accompanying the economic and social reforms in the Mediterranean countries
MERCOSUR	Southern Common Market (South America)
NAFTA	North American Free Trade Agreement
NIS	New Independent States of the former Soviet Union
OECD	Organization for Economic Cooperation and Development
OJ	Official Journal
PHARE	Aid for economic reconstruction of the CEECs
R&D	Research and Development
RPV	Reaction Pressure Vessel
RTD	Research and Technological Development
SAVE	Special Action Programme for Vigorous Energy Efficiency
SCA	Shared-Cost Actions
SMEs	Small and Medium-sized Enterprises
SPD	Single Programming Document (Structural Funds)
SPRINT	Strategic PRogramme for INnovation and Technology Transfer
STD/STD-3	Science and Technology for Development/STD under FP3
TACIS	Technical assistance to the New Independent States of the former Soviet Union
TASK FORCE	Research-industry coordination structure in a field of RTD
TCS	Technologies for Components and Subsystems
THERMIE	Demonstration programme in the field of non-nuclear energy
TMR	Training and Mobility of Researchers (specific RTD programme)
TSER	Targeted Socio-Economic Research (specific RTD programme)
TSME	Technology Stimulation Measures for SMEs
UMTS	Universal Mobile Telecommunication Systems
WMO	World Meteorological Office
WTO	World Trade Organization

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