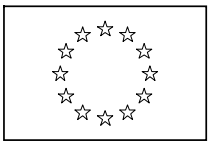

COMMISSION OF THE EUROPEAN COMMUNITIES

Brussels, 19.12.2000-
COM(2000) 842 final

COMMUNICATION FROM THE COMMISSION

Research and technological development activities of the European Union 2000 Annual Report

TABLE OF CONTENTS

Legal bases for the annual report[1]

- Treaty establishing the European Community, Article 173:

At the beginning of each year the Commission shall send a report to the European Parliament and the Council. The report shall include information on research and technological development activities and the dissemination of results during the previous year, and the work programme for the current year.

- Decision No 182/1999/EC concerning the 5th Framework Programme (OJ L 26, 1 February 1999), Article 5(4):

The Commission shall regularly inform the European Parliament and the Council of the overall progress of the implementation of the Framework Programme and the Specific Programmes.

- Decision No 1999/65/EC concerning the rules for participation (OJ L 26, 1 February 1999), Article 24:

The annual report which the Commission sends to the European Parliament and the Council in accordance with Article 173 of the Treaty shall contain information on the implementation of this Decision.

Sources of further information

- *Annual Monitoring Reports* published each year for the Framework Programme and each Specific Programme, which provide concise, independent feedback on the progress and quality of the measures taken to implement the programmes.

- *Five-year Assessment Reports* published every fourth year, both for the Framework Programme and for each Specific Programme, which present an independent retrospective evaluation of the relevance, efficiency, results and impact of the European Union RTD programmes.

- *The European Report on Science and Technology Indicators,* which contains descriptions, statistics and detailed analyses of European and national RTD activities in the world context.

- *Research and Development: Annual Statistics* (Eurostat): an annual publication containing comparable international statistics on R&D expenditure, R&D personnel and patents in the Member States, broken down by regional level.

- R&D and Innovation Statistics for the Candidate Countries and the Russian Federation (Eurostat).

- The Commission's *annual budgetary documents,* i.e. the preliminary draft budget, the budget, the consolidated revenue and expenditure account and the balance sheet.

---

[1] There are similar provisions for the Euratom Framework Programme (Euratom Treaty, Article 11; Decision 94/268/Euratom, Article 4(1); Decision 94/761/Euratom, Article 10(1)).

- *Studies and analyses* published in connection with the Community RTD programmes and addressing issues specific to the fields of RTD which they cover.

Most of these documents can be obtained or ordered from the Commission's Internet sites:

The Commission's general EUROPA site: http://europa.eu.int

The CORDIS site containing information on the Framework Programme: http://www.cordis.lu

Commission Directorate-General XII's site: http://europa.eu.int/comm/dg12

The EUROSTAT site: http://europa.eu.int/en/comm/eurostat

The Joint Research Centre (JRC) site: http://www.jrc.org

Extensive information on EU policies can be found on these sites, and in particular, on the CORDIS site which is devoted to the RTD Framework Programme and on DG XII's site, all the reference documents, the texts of calls for proposals and a host of other information, in line with the Commission's transparency and information policy.

1. SUMMARY

This annual report on the European Union's RTD activities takes stock of a period in which there were many new developments.

Following the European Parliament elections and the appointment of the new Commission, there has been a substantial move towards giving European research policy a more political and more ambitious profile, as endorsed by the Research Ministers.

On 18 January 2000 the Commission adopted the Communication *Towards a European Research Area* which recognises that the EU is spending less on research than its main competitors and that the gap is widening. The Commission therefore calls for the concerted mobilisation of the relevant policies and instruments at all levels. It identifies priority targets for creating a coherent research area in terms of human, material and financial resources that is attractive at international level and takes social concerns into account. The Commission's ideas aroused considerable interest among all the parties concerned, and were supported by the European Parliament and endorsed by the Lisbon European Council which gave them operational status by setting out implementation details and a timetable.

Where Community research activities proper are concerned, the 5th Framework Programme for RTD was launched. Researchers and research users helped to choose and revise the priorities in the 21 expert advisory groups for the programmes and key actions. The first calls for proposals were launched in March 1999 and over 16 000 proposals were received in the course of the year. This massive number of proposals is encouraging, especially as it reflects significant participation by the countries in the pre-accession phase which are now associated with the Framework Programme. The key actions accounted for 85% of the resources for the thematic programmes and made it possible to launch large-scale research partnerships (with an average Community contribution of €1.7 million) with major synergies ;between projects. The generic RTD activities and infrastructure support activities also generated large-scale projects and support for researcher mobility was stepped up. In the framework of all these activities special efforts were made both to encourage participation by women and comply with fundamental ethical principles, and to reconcile the need for consistency and administrative rigour with ease of access.

The impact of Community research is bound up with its transnational networks involving the business world, academia and research centres, as well as the access to European research offered to many SMEs (22% of all participations). This impact is reinforced by the fact that the 5th Framework Programme (both indirect activities and the activities of the Joint Research Centre) is directed towards major social and economic issues. Community research also plays a positive role in the drive towards European cohesion. Last but not least, it ensures consistency between certain types of RTD conducted in Europe and, in this connection, activities aimed at "combining" national and European policies could be stepped up.

Major steps are due to be taken to bring about the European Research Area in practical terms. The contribution of the Fifth Framework Programme to this undertaking is one of the aspects of its mid-term review. Looking to the longer term, in the autumn the Commission will also be adopting a strategic communication setting out its initial thinking on Community research after 2002.

2. A FRESH BOOST FOR RESEARCH POLICIES IN EUROPE

1999 was a year of major changes for the European institutions. Following the European Parliament elections and the appointment of the new Commission, radical changes were set in motion, and European research policy was one of the areas affected.

The new European Parliament confirmed its desire to monitor the implementation of Community programmes, including the Framework Programme for Research and Technological Development (RTD), and appointed rapporteurs for each budget heading concerned. At the same time, the European Parliament reorganised its specialised committees. Research matters are now debated by the new Committee for Industry, External Trade, Research and Energy, helping to situate European research in the broader context of the policies which contribute towards competitiveness, innovation and job creation in Europe. The Commision has been reporting regularly to Parliament on execution of the 5th Framework Programme.

The new Commission, on the initiative of Commissioner Busquin, has added a new dimension to Community research and innovation policy: the EU's scientific and technical resources must be harnessed in a more coherent fashion in order to sustain lasting, job-creating growth capable of meeting the aspirations of society.

These questions were already beginning to be addressed in 1999. For example, the research ministers debated the future of research with eminent scientists at the invitation of the German presidency in the margins of the 20 May 1999 Research Council. In the course of their discussions, the need to develop coordination and synergies between research policies and organisations in Europe was the subject of broad agreement. Following this debate, the Member States' representatives on CREST[2] examined "opportunities and challenges for future European research policy". In particular, they stressed the importance of coordinating research in Europe and examined possible ways of improving coordination.

[2] The Scientific and Technical Research Committee (which advises the Council and the Commission, is made up of Member States' representatives, and is chaired by the Commission).

3. TOWARDS A EUROPEAN RESEARCH AREA

Upon taking office, the new Commission took the initiative of giving RTD a genuine political dimension and setting the target of establishing a real European Research Area. On 18 January 2000 it adopted a Communication *Towards a European Research Area*, setting out the issues at stake and the possible ways of creating this more integrated *area*, and launching a wide-ranging debate on the subject.[3]

3.1. A challenge to be met

The Communication *Towards a European Research Area* finds that, while Europe possesses remarkable scientific expertise, it spends less on science and technology than its main partners and that the gap is widening alarmingly. The EU now devotes only 1.9% of its GDP to research, as against 2.7% in the United States and 3.1% in Japan. In terms of human resources, the difference is even more striking: researchers account for 2.4‰ of the workforce in Europe, compared with 5.9‰ in the United States and 6.3‰ in Japan. This gap is mainly attributable to private-sector research funding. As a result, research and innovation are lagging behind in Europe, at a time when they are becoming more crucial than ever before for competitiveness and employment with the advent of a global "knowledge-based society".

Furthermore, the research policies of the Community and Member States are conducted in isolation without real coordination. This results in rigidity and inefficiency in the allocation of resources at EU level, pushing Europe further behind. In this context, the EU needs to promote an overall strategy for European research. It can no longer afford to run the research Framework Programme in splendid isolation.

The communication therefore calls for a concerted effort on the part of policymakers and research players at all levels in Europe. Public and private-sector resources need to be better mobilised for research. A common political push is also necessary in order to ensure that research activities in Europe are truly coherent. To be sure, there are various initiatives that successfully underpin research exchanges and partnerships between the European countries, the main one being the RTD Framework Programme. But promoting trans-European research projects is not enough to get the ball rolling. To meet this challenge, the communication launches a debate on a set of courses and means of action at regional, national and European level.

3.2. Courses and means of action

The communication identifies seven priority areas for concerted action. The measures suggested are the responsibility of all the parties concerned: first and foremost all the Member States and the public sector at all levels, but also the private sector and the EU which has an important role to play in promoting, encouraging and boosting national and local initiatives and taking action at European level only where such action is justified.

---

[3] European Commission, *Towards a European Research Area*, COM(2000) 6, 18 January 2000. Website: europa.eu.int/comm/research/area.html

The *European Research Area* is thus based on the principles of subsidiarity and European added value. The themes to be debated are as follows:

- *Optimise the stock of material resources and facilities at European level.* To achieve this major objective, the communication suggests the mapping and networking of European centres of excellence, a European approach to research facilities, the development of electronic networks and better use of their potential for European researchers.

- *Make more coherent use of public instruments and resources.* To this end, the communication advocates the opening-up and better coordination of national and European research programmes, and closer relations between European organisations for science and technology cooperation.

- *Make private investment more dynamic.* In this connection, the communication proposes more concerted use of instruments for providing indirect support to research, better intellectual property protection, in particular by means of a Community patent, and the exploration of new avenues for encouraging company start-ups and risk capital investment.

- *Establish a common scientific and technical reference system for policy implementation*. In this regard, the Commission takes the view that research activities should take greater account of the needs of citizens and decision-makers, and that research results should be validated by means of a reliable and recognised system. The Commission considers that a common reference system should be based in particular on its Joint Research Centre (JRC) and the national research centres.

- *Give rise to more abundant and more mobile human resources*. First of all, there is a need to increase researcher mobility in Europe, in particular from one country to another and between the academic world and the business world. An important step would be to encourage the introduction of a European dimension into scientific careers. The communication also stresses the crucial role of the "Women and science" action plan to ensure a bigger place and role for women in research. Lastly, it recommends ambitious measures to give the young a taste for research and scientific careers.

- *Make the European landscape more dynamic, open and attractive to researchers and investment.* The communication identifies three broad lines of approach: increasing the role of the regions in the European research effort, integrating the scientific communities of Western and Eastern Europe, and making Europe attractive to researchers from the rest of the world.

- *Create an area of shared values.* The communication divides this objective into two parts: tackling science/society issues on a European scale, and developing a common vision of ethical issues in science and technology.

3.3. Debates and guidelines for action

The Communication *Towards a European Research Area* aroused considerable interest among all the bodies and players concerned.

On 18 May 2000 the European Parliament adopted a resolution welcoming the communication.[4] It stressed the importance of research in terms of increasing employment and prosperity. It called upon the European Commission and the Member States to develop a coordinated research policy so as to create a European area that will provide a stimulus for research and, first and foremost, for researchers.

On 24 May 2000 the Economic and Social Committee adopted a detailed opinion which supports the process set in motion by the communication, in particular with a view to developing the interactions between public-sector and private-sector research and improving the position of science and the attractiveness of scientific careers in society. In an opinion adopted on 12 April 2000 the Committee of the Regions also expressed its support for the creation of a European Research Area, stressing the important role of local and regional authorities with regard to scientific training and support for research.

The Research Ministers discussed the approaches outlined in the communication at an informal meeting on 6 March 2000 and then at a debate held the next day with Nobel prize-winners and eminent representatives of the European scientific community.

With the Special European Council held in Lisbon by the Portuguese Presidency on 23 and 24 March 2000, RTD policy was given greater recognition than ever before as a major priority on the agenda of the Heads of State and Government. They placed the creation of a European Research and Innovation Area at the heart of their strategy designed to enable the EU to become "the most competitive and dynamic knowledge-based economy in the world, capable of sustained economic growth providing more and better jobs and greater social cohesion."[5] The Heads of State and Government approved the objectives set out in the communication and stated that "research activities at national and Union level must be better integrated and coordinated." In particular, they called upon the Council and the Commission, together with the Member States where appropriate, to take the necessary steps in the following areas:

– Networking national and joint research programmes on a voluntary basis;

– Improving the environment for private research investment, R&D partnerships and high technology start-ups;

– Developing an open method of coordination for benchmarking national R&D policies;

– Creating a very high-speed trans-European telecommunications network for research;

– Creating a European area in which there is free mobility for researchers and which is attractive at international level;

---

4 European Parliament Resolution on the Communication from the Commission to the Council, the European Parliament, the Economic and Social Committee and the Committee of the Regions "Towards a European Research Area". European Parliament Website: http://www.europarl.eu.int/

5 Presidency Conclusions, Lisbon European Council, 23 and 24 March 2000. Council website: http://ue.eu.int/

– Introduction of a simple, effective and inexpensive Community patent.

On the basis of these guidelines issued by the European Council, together with the implementation details and a timetable, the Commission has prepared more operational plans. In so doing, it also took into account the results of the wide-ranging debate sparked off by its communication in the EU's advisory bodies, in the scientific community, and among all the parties concerned, in particular firms and their representative organisations.

More broadly, the invitation issued by the Commission to take part in the debate yielded numerous replies, whose constructive tone and quality made it possible to flesh out the guidelines proposed. In less than five months over 400 contributions have been received from all the EU countries (as well as from associated countries and third countries) and all the types of organisations concerned: large firms and SMEs, research centres, universities, and associations, etc. Substantial contributions were received from 30 or so of the most eminent scientists in the EU, Nobel prize-winners and Fields medallists, whom Commissioner Busquin asked for advice. The Commission also received a number of individual reactions, in particular via the forum on the Commission's website[6] on which summaries of the contributions received and the Commissioner's replies were regularly published.

Also, deliberations were conducted in the context of the *Futures* project coordinated by the Institute for Prospective Technological Studies of the Commission's Joint Research Centre with the participation of 200 or so experts.[7] These deliberations confirmed the crucial importance for the future of Europe of a high level of integration in the field of research and knowledge.

A high-level group of scientists and industrialists met on 3 May 2000 and made comments and proposals with a view to achieving the objectives set out in the communication. The meeting was preceded by exchanges of views between a number of interested personalities on the possible configuration of a future advisory body for major European science and technology issues.

The first concrete steps have therefore been proposed in the light of these debates. The Council of Ministers expressed its broad support for them in a resolution adopted on 15 June. This resolution specifies the initiatives desired by the Member States to implement the guidelines issued by the Lisbon European Council. The foundations have therefore been laid for bringing about a European Research Area through concerted initiatives by the EU and the Member States which are starting to take shape (cf. 6.1).

6 europa.eu.int/comm/research

7 *Futures* project website: futures.jrc.es.

4. COMMUNITY RESEARCH IN 1999

4.1. Launching of the 5th Framework Programme

Once the Framework Programme[8] was adopted in December 1998 and the Specific Programmes in January 1999, the Commission put the finishing touches to all the arrangements needed to launch the first research activities as quickly as possible. The priorities for 1999 were rapidly determined in consultation with the scientific community, industry and research users, thanks to the support of the 21 expert advisory groups for the programmes and key actions. Detailed work programmes and information packs for proposers were adopted and published for each Specific Programme, while common features such as the evaluation manual were also made available for the Framework Programme as a whole. The Joint Research Centre also very quickly adopted and implemented a work programme for the new priorities set in the Framework Programme, focusing in the case of non-nuclear activities on three strategic themes: "serving the citizen", "enhancing sustainability" and "underpinning European competitiveness". In addition, an event to launch the programme was held in Essen in February 1999 with over 5 000 participants.

Thanks to all these efforts, a first wave of calls for proposals was launched in March 1999 and the evaluation of the replies to these calls began in the summer with the help of independent experts. Over 1 000 contracts were signed in 1999, less than seven months after the close of the first calls for proposals. By the end of March 2000 over 3 500 contracts had already been signed under the 1999 budget. All in all, over 16 000 proposals were received in 1999, representing over 90 000 participations. This indicates the keen interest of the scientific community and industry in taking part in the Framework Programme and in its new approach.

4.2. Key actions

One of the main innovations of the 5th Framework Programme is the bringing-together of a large part of research activities in 23 multidisciplinary key actions, which are intended to respond to the priority needs of citizens and society. The principles governing these key actions are the gearing of research projects to problem-solving and the focusing of activities, either through bigger individual projects or by bringing projects together in formally ("clusters") or informally coordinated packages.

The key actions represented 85% of the resources allocated via the thematic programmes under the contracts signed.[9] The financial scale of the contracts has doubled compared with similar contracts under the 4th Framework Programme. Just under 1 000 RTD projects were launched in the context of the key actions of the various thematic programmes, with an average Community contribution of over € 1.7

---

8 Unless otherwise stated, throughout this report "Framework Programme" or "RTD Framework Programme" means the Framework Programme of the European Community (EC) for research, technological development and demonstration activities plus the Framework Programme of the European Atomic Energy Community (Euratom) for research and training activities.

9 The figures relating to contracts signed refer to all the contracts signed under the 1999 budget up to the end of March 2000, namely 3 500 contracts receiving a total Community contribution of € 3 300 million.

million. Few demonstration projects had been signed at the time of writing this report; however, 41 combined (RTD and demonstration) projects had been launched, with a Community contribution of over € 3 million on average. These sums are all the more significant given the fact that in all cases the Community contribution represents at most 50% of the total project costs for RTD aspects and 35% for the demonstration aspects. In addition, the consortia set up to carry out these RTD and demonstration projects generate significant networking effects, bringing together as they do on average over seven partners per project.

With regard to the grouping of projects, very few formal groupings ("clusters") were set up either spontaneously or at the Commission's suggestion. Nevertheless, certain areas did make significant use of this possibility, e.g. the key action "Control of infectious diseases". Some key actions also group together projects in the context of the thematic networks. In addition, the appropriateness of the projects funded in relation to the objectives of the key actions generates significant *de facto* synergies in terms of achieving these objectives. The work programmes for the individual Specific Programmes were adapted for the year 2000 in the light of the projects selected in 1999, so as to maximise complementary features and ensure consistency with the objectives set.

4.3. Generic RTD and support for research infrastructures

The generic RTD activities are an essential complement to the key actions in the case of priority research activities more geared to the long term, the spin-offs from which cover a broad range of areas of application. Over 200 research projects had been launched in the context of these activities by the end of March 2000, with an average Community contribution of over € 1.5 million. The scale of the projects funded by the EU has therefore increased a great deal for this type of activity too. The number of partners is similar to that for the projects carried out in the context of the key actions.

Research infrastructures can also be supported under the Framework Programme, essentially to improve access to these infrastructures and encourage their European networking. This support is therefore complementary to the national support for research infrastructures, and its financial scale is limited by comparison but its added value can be significant. A substantial proportion of the support for access to research infrastructures is administered "horizontally" by the "Human Potential" programme. Some 150 contracts had been signed in this area of activity by the end of March 2000, the average amount being € 800 000 per project and around € 300 000 per participating organisation.

4.4. Participation of Associated States and international cooperation

The forthcoming enlargement of the EU together with the globalisation of the economy and knowledge are some of the factors which explain the growing importance assigned to international RTD cooperation, which is implemented under the 5th Framework Programme in two ways: on the one hand, via the "Confirming the International Role of Community Research" Programme and, on the other, through the participation of third countries in other Specific Programmes. Where a number of countries are concerned, this participation is facilitated by S&T cooperation agreements (which reciprocally open up research programmes in those countries so that European entities can participate in them); as well as through

Framework Programme association agreements which enable researchers from the countries concerned in all the Specific Programmes to receive Community funding in exchange for a flat-rate contribution to the Framework Programme budget. Generally speaking, the activities undertaken are differentiated on the basis of the objectives pursued according to groups of target countries.

Countries in the pre-accession phase

As of 1 October 1999, the ten Central and Eastern European countries in the pre-accession phase and Cyprus became effectively associated with the Framework Programme (since which time Malta has also asked to be associated). In anticipation, these 11 associated countries enjoy regular political consultations with the Commission and their organisations were able to take part in the calls for proposals once the Framework Programme was launched. The results are encouraging, not only in terms of the number of participants, but also when one considers the total volume of activity in which they will be participating. By the end of March 2000 they accounted for almost 400 participations, or 3.4% of the total number of participations. This is an encouraging proportion for the first year that these countries are participating as countries associated with the Framework Programme, especially as it gives the countries in question access to a volume of RTD much higher than this proportion and to first-rate European research networks (7% of the bilateral cooperation links created by European RTD projects include a partner from these associated countries). Accompanying measures have been set up under the "International Role" programme in order to support them in their efforts to participate, and help to develop their "centres of excellence".

Other countries associated with the Framework Programme

Norway, Iceland, Liechtenstein and Israel, which were earlier associated with the 4th Framework Programme, are now associated with the 5th Framework Programme. Right from the first year these countries together accounted for some 330 participations in the projects under the Framework Programme. In addition, an association agreement with Switzerland were signed on 23 June 1999 and is due to enter into force in 2001.

Non-candidate Central and Eastern European countries and the New Independent States of the former Soviet Union

The S&T cooperation agreement with Russia has been initialled and submitted to the Council and the European Parliament. However, for political reasons, the signing of the agreement by the Council and the conclusion of the agreement after receiving the opinion of the European Parliament have been suspended for the time being. Ukraine has also asked to negotiate an S&T cooperation agreement, and a first exploratory visit took place in December 1999. In addition, the International Association for the Promotion of Cooperation with Scientists from the New Independent States of the former Soviet Union (INTAS) is funded mainly by the Community under the Framework Programme. In this context, 202 new projects were proposed in 1999, covering a broad spectrum of areas and countries, in addition to the COPERNICUS projects.

Mediterranean partner countries

The establishment of specific relations with this group of countries is an innovation of the 5th Framework Programme. The essential objective is to contribute to sustainable development in the Mediterranean area in the context of the Euro-Mediterranean partnership and the ultimate establishment of a free trade area. The approach pursued has been to focus on five strategic priorities for the region which are not fully covered by the other thematic programmes or by the INCO-DC Programme: socio-economic modernisation, sustainable management of regional water resources, preservation and use of the cultural heritage, promotion of health, and sustainable regional environment.

Developing countries

Efforts have continued to improve bilateral coordination between national initiatives and with Community initiatives. Within the Commission, the RTD and development services have embarked upon a joint analysis of themes and options for the use of RTD for development. In addition, two major coordination initiatives have been launched, one concerning tropical forests and another concerning perennial tropical oleaginous seeds and fruit. Other initiatives are continuing on strategic themes for developing countries, such as the development of a malaria vaccine and agriculture for development. In the latter area, the Commission is also continuing to participate in the Consultative Group on International Agricultural Research.

Emerging economies and industrialised countries other than Russia and Ukraine

The S&T cooperation agreement with the United States gave rise to the signature of implementing arrangements in the fields of metrology and materials. Lastly, the S&T cooperation agreement with China entered into force on 14 December 1999 and a similar agreement was concluded with Argentina. In the context of relations between major world regions, the Community made a significant contribution to the ASEM (Asia-Europe Meeting) Ministerial Conference on Science and Technology held in Peking on 14 and 15 October 1999 and launched the scientific and technological follow-up to the Rio Summit of 19 June 1999.

Coordination

To strengthen coordination and synergy between the various forms of S&T cooperation in Europe, the Commission continued to support the COST Programme and run its scientific secretariat. Four new countries (Bulgaria, Cyprus, Latvia and Lithuania) became member of COST which now includes 32 European countries. EUREKA continued to play an important role, in particular as regards scientific relations with the Central and Eastern European countries. Lithuania was accepted as a member of EUREKA at the Istanbul Ministerial Conference under the Turkish Presidency (1999), and then Latvia and Croatia became members along with Israel at the Hanover Conference under the current German Presidency.

4.5. European mobility of researchers

Direct support of researcher mobility was considerably stepped up in the context of the 5th Framework Programme with the “Human Potential” Programme. A "host fellowship" scheme has been set up whereby organisations selected by the

Community themselves choose the fellows that they host. This new type of fellowship is awarded in order to host fellows in industry (220 fellows selected in 1999), to host researchers in the Community's less-favoured regions (over 130 fellows selected), and to host postgraduates at high-level training sites (over 200 sites selected in 1999). All in all, over 3 000 fellows are in receipt of the Marie Curie fellowships selected for funding in 1999. In addition, 167 research training networks were selected in 1999, bringing together over 1 300 teams which will host nearly 4 000 young researchers.

4.6. Women in Community research

On 17 February 1999 the Commission adopted a Communication "Women and science: mobilising women to enrich European research."[10] In it the Commission deplores the under representation of women in scientific research, which represents an unacceptable loss for research in Europe, as well as unfair treatment. The communication lays the foundations for an action plan with two objectives: to stimulate debate and the exchange of experience between Member States and promote research by, for and about women within the 5th Framework Programme.

On 20 May 1999 the Council approved a resolution in which it supported this approach and called upon the Member States to participate actively in the dialogue proposed by the Commission, and to promote women in research at national level. The European Parliament also expressed its support in its resolution on women and science which it adopted on 3 February 2000.

To promote mobilisation in the Member States and Associated States, in 1999 the Commission convened the representatives of the networks of women scientists and gave rise to the setting-up of a group of national officials on women and science. In parallel, a group of 12 women scientists appointed by the Commission submitted a report in November 1999 taking stock of the situation of women in European research and setting out recommendations. The participation of women in the 5th Framework Programme will continue to be encouraged and stimulated at all levels, and in particular in the evaluation panels (25% of the members of the panels for the first series of evaluations were women). In addition, studies in the context of the Specific Programmes were launched in mid-2000 and gender research is being funded under the socio-economic key action.

4.7. Ethical aspects of Community research

The European Parliament and Council decision adopting the 5th Framework Programme specifies that all activities must be conducted in accordance with basic ethical principles. The European Group on Ethics on Science and New Technologies elucidated this statement of principle in its recommendation no. 10 "ethical aspects of the 5th Framework Programme," drawing conclusions about how the Commission should exercise due vigilance in connection with the implementation of the programmes.

In particular, the Council Decision adopting the "Quality of Life" Programme specifies the ethical limits to research activities funded by the Community, excluding

---

[10] COM(99) 76 final. This and other documents referred to in this section are available on the "Women and Science" website: www.cordis.lu/improving/src/hp_women.htm

certain types of research; restricting the use of animals; including research for the benefit of the most vulnerable, and research into bioethics; and harmonising the approach for this programme with the provisions of international texts.

The Commission has translated these requirements into concrete measures. Researchers are requested to address the ethical aspects of their projects carefully when they are submitted. In addition, the scientific evaluation of research projects incorporates ethical considerations; and the projects in the field of life sciences which raise particular ethical issues are the subject of a specific ethical review. This is the case in particular with research involving clinical testing, experiments on non-human primates and the use of human embryos. Each call for proposals in 1999 gave rise to an ethical review by a pluralist, multidisciplinary panel of several dozen sensitive proposals, culminating in consensus-based positions with the proposers concerned. Lastly, the contract negotiation process makes it possible to ensure that all the authorisations required at national level have in fact been obtained by the researchers in order to carry out their work.

Quite apart from these regulatory considerations, it is important to stress the pedagogical role that the Commission can play and the stimulus that it can provide through the Framework Programme to raise researchers' awareness of the ethical dimension of science.

4.8. Monitoring of Community research

In compliance with legislative requirements in the relevant programme decisions, panels of independent experts conducted the 1999 annual monitoring of the Framework Programme and its Specific Programmes. The Framework Programme Monitoring Panel congratulated the Commission services on their management of the transition from FP4 to the different programme structure, objectives and procedures of FP5, in the context of time pressure and heavy workloads due to the late adoption of the FP decisions. The Panel also commended the introduction of many developments and innovations, such as the transparent proposal evaluation system now standardised across the Framework Programme.

However, the Panel considered that major challenges were already facing the Framework Programme. Its main concerns were related to further improvement of programme management, human resources policy and research impact. The Panel made a number of operational recommendations mostly linked to these topics. In general terms, it recommended that:

– the administration of the "call for proposals to project contract" phase should be improved;

– an effective human resources policy should be developed across the Framework Programme;

– impact should be strengthened as well as its assessment mechanisms in FP5.

The Panel further considered that gender awareness should be strengthened, notably through appropriate gender-based data collection and continued efforts to encourage female evaluators to apply for inclusion in the proposal evaluators' database. Finally, the Panel stressed the importance of public awareness of S&T and recommended that

appropriate measures should be developed by each operational programme director and integrated into an overall approach at the FP level.

The Commission has responded favourably to the Panel's recommendations and is taking steps towards their implementation.

4.9. Implementation of the Framework Programme

In managing the Framework Programmes, the approach of the Commission has always been to apply a number of, by now well-known, fundamental principles:

- equality of access to the programmes for all potential participants and equal treatment of proposals;
- selection of proposals on the basis of quality;
- transparency and objectivity of criteria and procedures;
- balance between quality and rapidity of procedures, whilst maintaining sound stewardship of public money.

During the preparation for the launch of the 5th Framework Programme and in its first year of operation, these principles have continued to be applied and, in addition, a strong push has been made towards improving coherence across all Specific Programmes. Other than changes to internal ways of working, the principal and most visible results from this work include:

- a common manual of proposal evaluation procedures to be followed by all Specific Programmes;
- a new set of model contracts for all the means of implementation used in the Specific Programmes;
- an extension to all Specific Programmes and complete redesign of the European research and innovation Website, CORDIS[11];
- a set of guides for proposers;
- an open call for applications from potential expert evaluators of proposals and a common evaluator database;
- a common facility for the receipt, encoding and evaluation of proposals, with administrative support by an external service provider;
- a revised procedure following the evaluation of proposals, allowing contract negotiations to begin sooner with partners in successful proposals.

In terms of managing the start of FP5, the most significant development was that the late adoption of the Framework Programme and Specific Programmes decisions, combined with the expectations of the RTD community and the necessity to commit the 1999 budget of each programme, dictated a “big bang” launch with most of the

11 www.cordis.lu

first calls closing within a very short period between June and July 1999. This situation provoked some operational problems and difficult working conditions for the initial evaluation sessions during those two months. Despite these initial problems, as already noted some 16 000 proposals were processed and 12 000 evaluated in 1999 all were given fair treatment and the Commission was able to prepare contracts with successful proposers on time.

As anticipated, the change in procedures following the evaluation sessions led to contract negotiations being opened with successful proposers some two months faster on average than under the 4th Framework Programme. Unfortunately, however, it was not possible to inform unsuccessful proposers as rapidly as planned in 1999. This latter point was among a number of management problems identified by the Commission which led to the setting up at the beginning of 2000 of an inter-service group on improving and simplifying the management of the RTD programmes, whose conclusions are now being implemented (cf. 6.2.).

5. IMPACT OF COMMUNITY RESEARCH

5.1. Transnational cooperation links

Since its inception the Framework Programme has had a major networking effect in Europe as a result of its principle of mainly funding multinational research consortia. The bigger size of research projects under the 5th Framework Programme (7 partners per project on average) accentuates this "virtual mobility" effect, which stimulates and encourages the "real" mobility of researchers. The 1 500 RTD and demonstration projects launched by March 2000 (under the 1999 budget) created over 36 000 cooperation links including over 30 000 transnational links.

5.2. SME access to research

For the 5th Framework Programme the Commission adopted the harmonised definition of small and medium-sized enterprises (SMEs) which now applies to all EU activities. This definition limits the maximum number of employees to 249 compared with 499 for the 4th Framework Programme. In addition, SME access to the Framework Programme has been facilitated by the establishment of a *single entry point* for SMEs, backed up by a network of "national contact points" in the Member States and Associated States. In addition, the specific measures for SMEs have been extended to cover the entire (EC) Framework Programme. As before, exploratory awards are granted to enable two SMEs to prepare the submission of a research proposal, and cooperative research contracts ("CRAFT") are awarded to enable several SMEs to have research carried out by third parties.

Thanks to these new arrangements, by the end of March 2000 (under the 1999 budget) SMEs accounted for 22% of participations in the thematic programmes (EC). The corresponding financial contributions are well in excess of the 10% demanded by the European Parliament, representing as they do 18.5% of total contributions.

In particular, applications for specific measures increased by 20% in 1999 compared with the first year of the 4th Framework Programme: almost 850 applications for exploratory awards and 150 cooperative research proposals were received in the first year. Almost 40% of these projects were selected and will enable over 1 000 SMEs

to participate, often for the first time, in an international research project. In almost 80% of cases SMEs with fewer than 50 employees are concerned.

Growing use has been made of specific measures under the "Quality of Life" programme, and this should ultimately considerably increase the rate of participation of SMEs in this programme. SME participation in the Framework Programme will also be stimulated by the launching of 20 or so economic and technological intelligence activities which will help SMEs to identify economic and technological trends in sectors such as leather, biomass, e-commerce, aerospace and nanotechnologies, and subsequently help them to prepare joint research projects.

5.3. Impact on competitiveness, employment and the quality of life

The impact of research on the economy and society has been the subject of numerous studies both at Community level and more generally.[12] One of the main conclusions is that there is no doubt about this impact. RTD-driven innovation is the engine for growth in many sectors of the economy, and an essential factor in social change; however, it is extremely difficult to measure this impact precisely given the diffuse nature of the effect of research.

Where European research *per se* is concerned, some aspects should be stressed which give the Framework Programme special added value. First of all, companies account for one-third of participations in the thematic programmes whether in terms of the number of participations (32.5%) or in financial terms (34%): this high level of involvement of economic operators clearly shows that Community research is responsive to some of their needs. The other participants are mainly research centres and higher education institutions, each of which categories represents some 30% of participations. In this way, Community research contributes considerably to cooperation between several spheres which do not always come together spontaneously: the business world, academic research and research centres. Similarly, the Framework Programme provides a meeting place where public-sector and private-sector research participates in equal proportions. In the case of the thematic programmes the private sector's participation is higher, accounting for 53% of total participations and 55% of the financial contributions received.

The new approach reflected in the 5th Framework Programme should further increase the economic and social impact of EU-funded RTD. The targeting of the key actions on major socio-economic issues is reflected in a "technological implementation plan" for each RTD project, the introduction of socio-economic relevance criteria in project evaluation, and the setting-up of "innovation teams" for the thematic programmes. In addition, the work programmes for the Specific Programmes were drawn up in 1999 and revised for 2000 on the basis of the opinions of the expert advisory groups for the key actions on which research users are well represented. The Commission services responsible for the various EU policies concerned by research also made their contribution to the revision of the work programmes.

---

[12] See the 1999 Annual Report (COM(99) 284 final/2) for a presentation of some of the studies carried out at Community level in 1998/1999.

The "Innovation and SMEs" programme enhances the impact of Community research. On the one hand, it is a vehicle for coordinating activities relating to SMEs and innovation and a "service provider" for innovative firms, in particular SMEs taking part in the Framework Programme. The services offered include a single entry point for SMEs and intellectual property rights (IPR) and innovation financing (LIFT) help desks. On the other, the programme runs pilot activities to promote innovation and technology transfer, an example of which is the I-TEC "Innovation and Technology Equity Capital") programme for young innovative firms in cooperation with the European Investment Fund and the European Investment Bank. Also, with its "innovation trend chart", the programme provides a reference tool for European and national decision-makers to discuss, analyse and launch innovation policy initiatives, for example, the Commission's Communication on "Innovation in a Knowledge-Driven Economy"[13].

Lastly, the RTD carried out by the Commission's Joint Research Centre (JRC) plays an important role in the implementation of Community policies and more generally as a source of S&T references for Europe as a whole. In 1999 the JRC initiated a series of regroupings in order to optimise synergy between its activities on major issues in terms of socio-economic impact: emissions and their impact on human health and environment, global change, food, the farming environment and, in the nuclear safety field, ageing reactors.

5.4. Impact on European economic cohesion

From the point of view of cohesion, the Framework Programme complements the structural policies where RTD is concerned. The regulations of the Structural Funds for the period 2000-2006, which were approved in 1999, confirm their role in encouraging innovation and the uptake of new technologies and enhancing RTD capacities contributing to regional development by supporting research infrastructures and human resources

An analysis of the participation of the "cohesion" countries (Greece, Spain, Ireland and Portugal) in the Framework Programme shows that they play a positive role with respect to the less-favoured regions, accounting as they do for only 7.8% of R&D personnel in the EU but 14.5% of EU participations in the Framework Programme (contracts signed as of 31 March 2000). The role of the partners from these countries is far from secondary, accounting as they do for 13% of the project coordinators. In financial terms the figures are even more favourable as far as the cohesion countries are concerned: with 10.7% of the financial contributions their share of the funding granted under the Framework Programme is 2.5 times their share in total EU R&D spending (4.2%). In addition, because of the nature of European RTD partnerships the funding directly received by the participants only accounts for a fraction of the volume of RTD to which they have access. Lastly, in terms of access to European research networks, 25% of the cooperation links generated by the Framework Programme in the first year include a participant from the cohesion countries.

The Framework Programme has thus contributed towards the definition of regional strategies for innovation, technology transfer and the networking of the regions

---

13 COM (2000) 567, 20 Septembre 2000

concerned, with activities funded by the "Innovation and SMEs" programme in cooperation with the Commission services responsible for regional policy.

5.5. "Combination" of national and European policies

Community research partnerships have a significant effect on the *de facto* consistency of certain areas of European research. It can be observed that many RTD organisations in the Member States and associated countries are tending to structure some of their research activities to make them consistent with the Framework Programme; this helps to make them mutually compatible, facilitating cooperation and synergies from EU-funded projects.

The Framework Programme also includes activities directly aimed at coordinating research activities in the EU: the "thematic networks" and the "key actions." In the case of the former 250 and in the case of the latter 30 or so actions were selected for funding in 1999, which represents a significant achievement but which should nevertheless be bettered. Additional initiatives have been taken to promote coordination within the Specific Programmes. For example, the "Quality of Life" programme management committee has set up a working party to explore the possibilities of coordination in certain areas of life sciences.

CREST, an advisory body consisting of Member States' representatives and chaired by the Commission, observes and promotes these developments. In 1999 it set up three working parties on "opportunities and challenges for the future of European research policy," one of which is addressing the coordination of RTD policies. Commission staff have provided factual support. This working party's report analyses and clarifies the coordination concept, the parties involved, the framework and the possible obstacles. It has been submitted to the Commission which will use it as a basis for drawing conclusions on the implementation of the coordination aspects of the European Research Area, the implementation of the 5th Framework Programme and its deliberations on Community research after 2002 (cf. section 6).

6. OUTLOOK

6.1. 6.1. Creation of a European Research Area

In accordance with the conclusions of the Lisbon European Council and the wishes expressed by the Council of Ministers on 15 June 2000, the Commission and the Member States have undertaken to take important measures rapidly in order to create a European Research Area. The success of these measures depends on the active involvement of the Member States and the Commission. They include the following:

- *Developing an open method of coordination for benchmarking national R&D policies and activities using a set of indicators.* These indicators and a methodology will be established by the Commission in cooperation with the Member States.

- *Promoting the networking of national and joint research programmes on a voluntary basis.* Major objectives will be to improve mutual information and gradually open up the national programmes. The EU will encourage these developments and examine the advisability of incentive measures at EU level.

- *Mapping S&T excellence in the Union.* The Commission will set out objectives and a methodology this year to carry out this mapping exercise in close cooperation with the Member States.

- *Creating a very high-speed trans-European telecommunications network for research* linking the national research networks, with the help in particular of the European Investment Bank.

- *Analysing the obstacles to the mobility of researchers in Europe* and initiating the reforms needed to remove these obstacles. A working party of national experts will be set up to examine the situation and propose the measures needed.

- *Encouraging initiatives to promote innovation and technological "start-ups,"* in particular with the help of the European Investment Bank. The exchange of information on these issues will also be improved by introducing an "innovation trend chart."

- *Introducing a Community patent* on the basis of the new Commission proposals.

- *Monitoring the development of European RTD policies and progress towards a European Research Area.* This monitoring will take the form, for example, of regular Commission reports on the state of research in Europe.

In addition, the Commission will shortly be presenting operational initiatives for other aspects of the European Research Area, such as the establishment of a scientific reference system in support of policy-making, the regional dimension of research, the opening-up of the European Research Area to the rest of the world, the relationship between science and technology and society, and the ethical aspects of research. The objectives of the European Research Area will also be reflected in the EU's future activities in support of research.

6.2. Implementation of the 5th Framework Programme

Commission staff are analysing the conclusions that can be drawn about the implementation of the Framework Programme so far, the aim being to make it more accessible and user-friendly for all research players and to ensure that it contributes as effectively as possible to the creation of a European Research Area.

In this connection, the Commission's services are basing themselves on their own work (including the participant satisfaction surveys), the 1999 monitoring panels' reports, and the conclusions of the high-level experts given the task in the first half of 2000 of evaluating Community research over the last five years. Where the management of the Framework Programme is concerned, the interservice working group set up at the beginning of 2000 has proposed major simplifications, in particular concerning information for proposers, the contract preparation forms, and the procedure and registration form for the evaluators database. The Council and Parliament have been kept regularly informed of these developments.

The Commission has drawn conclusions from these exercises in its mid-term review of the Framework Programme sets out indications for the progress of the 5th Framework Programme in 2001 and 2002.

6.3. Preparation of future Community research activities

These exercises have also culminated in the first guidelines for research activities after 2002 which have been presented in the Communication *Making a Reality of the European Research Area: Guidelines for EU Research Activities (2002-2006).*[14] The objective is notably to configure the Framework Programme as a catalyst for helping to make a reality of the European Research Area in synergy with other instruments.

The aim of the communication is to spark off detailed debates in the European Parliament, the Council, in the EU's advisory bodies and among all interested parties. On the basis of these debates, the Commission will prepare formal proposals for the next Framework Programme which it will submit in the first quarter of 2001.

As a result, the Parliament/Council co-decision process will be able to start in time for the new Framework Programme to be adopted well before the end of 2002, thus ensuring the continuity and continuation of Community RTD activities.

[14] COM(2000) 612, 4 October 2000.

ANNEX 1

ACTIVITIES OF THE SPECIFIC PROGRAMMES

CONTENTS

Quality of life and management of living resources

Key indicators	Proposals received in 1999		Proposals selected for funding in 1999		Contracts signed on the 1999 budget (until 31.03.2000)	
	Number	Contribution Requested (million €)	Number	Contribution proposed (million €)	Number	Contribution granted (million €)
Shared cost actions	3 576	5781.60	338	482.80	277	407.40
Grants	459	45.90	65	7.30	64	6.43
Support to networks	79	75.56	7	6.01		
Concerted actions	166	129.23	14	6.29		
Accompanying measures	145	15.08	39	1.31		
TOTAL	**4 425**	**6 047.37**	**463**	**503.71**	**341**	**413.83**

The "Quality of Life" Programme was successfully launched in 1999, with a major call for proposals published on 6 March 1999. The response rate and quality of proposals received has been very satisfactory overall, with particularly a good mobilisation of the private sector. The new "problem-solving" approach has led to interesting proposals and notably to some major "clusters", associating several RTD proposals towards a common aim. The emphasis on the socio-economic dimension has also been taken up in many proposals although further progress is needed in some areas. The interservice group of directors has proved successful as a means of orientating the programme activities towards policy needs. "Mini-teams" have been set up to deliver operational advice for each key-action and memos have been made available to proposers and evaluators explaining how RTD proposals could be made to support EU policies.

Implementation of the recommendations of the 1998 monitoring panels

The 1998 programme monitoring recommendations for the FAIR, BIOTECH 2 and BIOMED 2 programmes focused mainly on strategic issues (relevance and relationship to policy of research, dissemination and exploitation of results), specific actions (provision of QuickScan for patent novelty search and Medline to proposal evaluators) and FP4 project monitoring. Despite the pressures in 1999 of implementing the first phase of the Quality of Life programme, the programme management has responded to the recommendations or is in the process of doing so. Further improvements in project monitoring procedures are planned for 2000.

Main recommendations of the 1999 monitoring panel

The 2000 monitoring panel commended the quality of programme management and the successful launch of the programme despite high time pressure and heavy workloads. It recommended notably to make the information package for potential applicants clearer; to experiment with a revised evaluation procedure where evaluators would receive anonymous parts of proposals in advance of evaluation sessions; to involve more pro-actively the various stakeholders and experts in the socio-economic aspects of research; and to improve feedback to proposers on the assessment of their projects. It also suggested that all projects should be subjected to a formal mid-term review with external expertise. These recommendations are being carefully considered and some are already being implemented.

The "Quality of Life" Programme Committee met eight times in 1999, efficiently following and supporting the programme's activities (Member States delegations had met twice before as an informal discussion group to help prepare the work programme). All associated countries participate in the meetings as observers. In the autumn meetings, the update of the work programme was discussed and eventually endorsed. In 2000, the Programme Committee will continue to monitor the work programme update and give its opinion on the funding of selected projects. It will also follow up the fine-tuning of the evaluation procedure. Lastly, it

has set up ad-hoc working groups to work on the impact assessment of FP4 and FP5 "Life Sciences" Programmes and investigate possible synergies between EC and national activities.

The "Quality of Life" Programme has 5 Expert Advisory Groups (EAGs) to cover its six key actions (KAs). In addition, two High-level Expert Groups (HLEGs) were established in 1999 to advise the Commission on strategic issues concerning the generic activities. The Expert Advisory Groups have each met three times in 1999, and the HLEGS once. In addition to the group meetings, it was decided in several cases that targeted workshops would help forge the link between the research community and the stakeholders and focus advice on specific issues. These workshops dealt with *Ageing, Bioentrepeneurship, Antibiotic Resistance* and *GMO Research in Perspective*. In addition, joint meetings of the Expert Advisory Group Chairs and Vice-Chairs were organised to discuss issues of common concern, ensure co-ordination between the Expert Advisory Groups and HLEGs, maintain the cohesion and unity of the programme and ensure a broad strategic vision.

The update of the work programme for 2000 has been heavily influenced by the advice of the Expert Advisory Groups[15]. As was done in 1999, and prior to each new call for proposals, the work programme will be updated with inputs from Commission services, the Expert Advisory Groups and the Programme Committee, taking into account the latest scientific and societal developments, as well as the response to the first calls of the programme.

KEY ACTION 1: FOOD, NUTRITION AND HEALTH

Activities in 1999

The first call for proposals for the key action was published on 6 March 1999 with the deadlines of 1 June and 15 November. By the close of the first deadline, 190 proposals for shared-cost actions were submitted, of which 180 were declared eligible and evaluated and 39 adopted, with a Community contribution of €65.7 million.

The proposals selected during this first call for proposals correspond well to the scientific priorities. They are multidisciplinary and will help to achieve the principal objectives of the key action, which aims to provide European consumers with healthy, safe and high-quality products while increasing the competitiveness of European industry. This first call has led to a satisfactory level of industrial penetration (the number of projects with at least one partner from industry) of 67% out of the proposals selected.

In the field of nutrition, eight projects are aimed directly at improving understanding of the mechanisms underlying the links between food components, dietary habits and optimum state of health (antioxidants and colon cancer, calcium and osteoporosis, etc.). As regards food safety, seven projects are aimed at the development of methods for the detection of undesirable substances (e.g. hormones and pathogens). Five projects especially address the aspects of food safety and the traceability of genetically modified organisms (GMOs).

In addition, the key action adopted 34 proposals for exploratory awards and six cooperative research projects in the framework of support for SMEs. Ten accompanying measures were also selected, most of them concerned with the organisation of conferences on important topics, such as the International Congress on Improved Traditional Foods for the Next Century held in Valence on 28 and 29 October 1999. Lastly, to support the training and

---

15 Published on the Internet: http://europa.eu.int/comm/dg12/fp5/eag.html

mobility of researchers, 18 individual mobility grants were funded as well as five training sites and three scholarships in business.

Examples of projects launched in 1999

A "cluster" bringing together 3 shared-cost research projects is concerned with coeliac disease and its genetic components among the EU population. This concerns the problem of the most widespread food intolerance among the EU population and will consequently have a major impact on public health. The project will develop a simple diagnostic test to enable the extent of coeliac disease to be better evaluated at EU level, to decipher its genetic components, and to study its pathogenesis on the basis of recent discoveries in immunology.

A second cluster composed *a posteriori* is aimed at preventing and reducing the presence of mycotoxins by application of the HACCP (hazard analysis and control of critical points) method. Mycotoxins may be produced by mould in foods such as cereals and fruit and can be transferred by the food chain in milk. They are carcinogenic, mutagenic and teratogenic even in minute concentrations and cause cancers and liver and kidney diseases. The studies will concentrate on the processing of cereals before and after harvesting (prevention and possibilities of decontamination by biological means). The results on ochratoxin A and the *Fusarium* mould toxins will serve as a general model for natural toxins and for undesirable substances.

Activities in 2000

In addition to continuing with the evaluation and selection of the proposals received in response to the various calls for proposals, the key action will review the work programme with an eye to 2001. For this purpose, two meetings are planned with the expert advisory group, seminars will be organised on certain subjects and a Web page has been developed for the members of the advisory group to facilitate detailed exchanges.

KEY ACTION 2: CONTROL OF INFECTIOUS DISEASES

Activities in 1999

The main objective of the key action is to develop new and improved vaccines, to identify strategies for treatment and prevention and to develop the research base for public health practices related to infectious diseases. Only the area 2.1. on the "development of vaccines" was open for the June 1999 deadline with an indicative budget of €64 million. Generally, the response to the call in terms of quality and relevance of the proposals was high, and the problem-solving concept of the key action had been understood. The applications covered all different areas of vaccine research, including human vaccines, transdisease vaccinology, animal vaccines and aquaculture vaccines.

A total of 34 projects were selected for funding out of the 110 proposals received. Industrial participation was encouraging and the industrial penetration (presence of at least one industrial participant in a project) was close to 80% among the selected projects. The expected impact of selected proposals is particularly high among the "Human Vaccines" action line where four "cluster" projects will target the development of vaccines against infectious diseases of major social and economic importance : AIDS, hepatitis C, tuberculosis and malaria. In addition, one project on respiratory syncytical viruses (RSV) is building on high innovative technology and other projects will cover the development of vaccines against meningococcal, Shigella and Hantavirus infections. The action line on "Transdisease Vaccinology" presents for example a cluster project on mucosal immunisation aiming at

improving the delivery of vaccine antigens through mucosal surfaces and one project aiming at the optimisation of vaccines against three important early-life human diseases (pneumonia, pertussis and RSV). For the "Animal Vaccines", for instance, two projects concern the post-weaning multisystemic wasting syndrome, an emerging disease of pigs causing great economic losses. In the action line of "Aquaculture Vaccines", the selected project aims to replace currently used vaccine adjuvants with less harmful products with possible benefits for the whole veterinary field.

Examples of projects launched in 1999

The main objective of the EuroVac "cluster" project is to create a European vaccine candidate against the HIV virus. The sub-type B (mainly European) and the sub-type C (which is spreading most rapidly) will be included. EuroVac has several closely linked components: coordination (decision-making), production (testing of vaccine candidates) and development (clinical trials on human beings and primates). The Commission has invested € 8.8 million in this project out of a total cost of € 17.8 million.

More than five million Europeans are infected by Hepatitis C. At the present time, the problem is more serious than AIDS and the impact will be even more visible between 2010 and 2020. For the first time, 20 renowned laboratories, including two in industry, have come together at European level to combat this infection and to develop a vaccine. This "cluster" project, with a total cost of € 7.3 million, is bringing together fields such as genetic engineering, immunology, vaccinology, molecular biology, chemistry, structural biology and clinical experience to create a new scientific research structure.

Activities in 2000

The 330 proposals submitted for the 15 November 1999 deadline on the areas "Strategies for treatment and prevention" and "Public Health aspects" are being evaluated and selected in 2000. Furthermore, several workshops on topics related to the work programme are planned as well as the evaluation of new proposals for the October 2000 deadline.

KEY ACTION 3: THE CELL FACTORY

Activities in 1999

The first call for proposals for RTD actions in the "Cell Factory" was published on 6 March 1999 with 2 deadlines for RTD projects, thematic networks and concerted actions: 01/06/1999 and 15/11/1999. Other types of actions: accompanying measures, fellowships, SME exploratory awards and cooperative research, were open throughout 1999 with different cut-off dates where proposals received until that date were evaluated.

As many as 399 RTD proposals were received at the closing of the first deadline which covered around 65% of the research action lines of the key action. At the end of the evaluation process, 41 proposals were selected for funding, with an average EC contribution by project close to € 2 million. A direct input on industrial competitiveness is expected from many of these proposals, where the industrial penetration (percentage of projects having at least one industrial partner) is close to 100%. In many cases more than one industry is involved in the consortium.

The projects to be supported address a vast variety of areas for which the "cell factory" is at the core of the problem. Among the top proposals, some address health aspects derived from cell factories such as novel concepts for treating degenerative, neurological or muscle diseases, cancer or genetic disorders. Other projects address novel concepts for the production

of new antibiotics and innovative ideas for using plants, sponges and fungi as a cell factory for producing molecules of high therapeutic value. There are also projects addressing problems faced by the pharmaceutical industry and with high social and political relevance such as rapid control techniques and methods aimed at reducing the number of animals used for toxicology tests by using *in vitro* tests. Environmental aspects are equally addressed by funded projects, notably: treatment of new biocatalysts/enzymes, biodegradation of herbicides, phytoremediation, heavy metals decontamination and bioavailability. Finally, the proposals to be supported in the action line dealing with processes and products from cell factories can significantly contribute to improving quality in food, agro-industry and fine chemicals. There are also projects with a broad range of interest, like electric DNA chips for the monitoring of expression systems, with broad applications in many industrial sectors.

The second deadline has elicited 117 proposals which were evaluated during December 1999 and January 2000.

Examples of projects launched in 1999

The transplantation of umbilical cord blood stem cells may constitute a very powerful therapy for the treatment of a large number of potentially fatal diseases, including leukaemia. It seems to offer interesting alternatives to the more conventional transplantations using bone marrow. A European network will organise the transfer of expertise on the technologies concerned in the European clinical centres in order to improve, evaluate, standardise and finally apply them. The project will permit a pan-European evaluation of the impact of this type of transplantation of stem cells on the survival of patients. The results will also lead to the creation of new protocols for gene and umbilical cord blood stem cell therapy, which may be of major benefit in the long term.

The waste water resulting from the production of vaccines is highly polluted by organic substances containing mercury which are used in the process as a disinfectant (*thiomersal*). One project is developing a new technology for the treatment of this type of effluent: it proposes a biotechnology for the selected extraction of *thiomersal* from waste water using new types of non-porous membranes for ion exchange. In a second stage, the *thiomersal* will be degraded to form metallic mercury by very efficient micro-organisms, strains made by genetic modification under the project. A pilot installation based on the concept of "biological containment" will be developed allowing continuous operation and the recovery of the metallic mercury produced. This project therefore has three main aspects:

– the purification of highly toxic waters;
– the use of genetically modified organisms under strict safety rules;
– the application of the process under industrial conditions.

Activities in 2000

In addition to the evaluation and selection of proposals submitted, the emphasis is on the mid-term review of the programme and the strategic analysis of the work programme, including its revision for the year 2001. In this context, a series of interactions with the "Quality of Life" Programme Committee and the External Advisory Group on Cell Factory are foreseen. As far as implementation is concerned, particular efforts are made on promoting the exploitation of results of the previous and current Framework Programmes projects related to the "cell factory" in the industrial and public sectors.

KEY ACTION 4: ENVIRONMENT AND HEALTH

Activities in 1999

The key action aims at assessing health hazards and reducing the health effects (including allergies) of environmental factors. Its ultimate objective is to support health and environmental policy-making and facilitate information on health and environment to the public.

The 1999 call received 162 proposals, demonstrating the high expectations of the scientific community in this innovative area of research. After evaluation, 25 projects were selected for funding in 1999 for a total EU contribution of € 35.95 million. The projects selected offer a good coverage of the work programme and promise to make concrete contributions to public health and environmental policy. They will provide a direct input into risk analysis and assessment, improvement of occupational health and safety and new preventive approaches. New scientific knowledge to support regulatory initiatives will be generated. In many cases, the industrial implications of the selected proposals are important with potentially significant spin-offs.

Five proposals address the potential health impact of electromagnetic radiation. Several projects are related to safety and toxicity due to chemical exposure (flame retardants, asbestos substitutes, pesticides, dioxins and other endocrine disrupters). Four proposals tackle the increasing public health problem of allergy. Three proposals deal with air pollution, developing new quantitative and mechanistic data on the effects of air pollution and new bio-markers. Other projects are related to UV exposure and to health effects related to noise pollution.

Finally, this key action also funded 2 accompanying measures and 2 fellowships in 1999.

Examples of projects launched in 1999

The European prospective study on the environment, allergies and the lungs brings together 21 teams from 13 different countries to collect detailed information from more than 10 000 young individuals. The aim of the project is to determine and predict the incidence of allergies, allergic diseases and lung-related problems, and to evaluate the risks of troubles of this kind attributable to the environment as well as the effect of certain factors such as the taking of steroids. The results of the study should make it possible to improve the prevention of these health problems and provide a better quality of life for the patients concerned. They will also constitute a major contribution to the policy to combat air pollution.

In the context of increasing use of mobile telephones and fears about potential health effects related to this use, a project aims to determine whether the use of mobile telephones increases the risk of cancer. Multicentric studies will be carried out, focusing on the most common tumours such as tumours of the brain, the salivary gland and the acoustic nerve. Medical data and detailed information about the use of mobile telephones will be collected from people aged between 30 and 59 in 13 countries, including seven Member States and two associated countries. To optimise the biostatistical quality and the epidemiological value of the study, the teams in the 13 countries concerned will use the same research protocol and the data analysis will be coordinated by the CIRC (International Centre for Cancer Research - Lyon).

Activities in 2000

In 2000, proposals submitted by 15 March 2000 will be evaluated and their selection process finalised. Furthermore several workshops and seminars on topics related to the work programme (EMF, allergy, socio-economic aspects) are planned in 2000.

KEY ACTION 5: SUSTAINABLE MANAGEMENT OF AGRICULTURE, FISHERIES AND FORESTRY, AND DEVELOPMENT OF RURAL AREAS INCLUDING MOUNTAIN AREAS

Activities in 1999

The first call for proposals for key action 5 was published on 6 March 1999 with a first deadline for submission of 8 June and a second of 15 November 1999. At the closing of the first deadline, for which about 50% of the fields of research were open, 301 proposals had been submitted. After evaluation, 71 proposals were adopted, four of them on a reserve list, with a total Community contribution of € 94.5 million. The principal objectives and priorities are covered by the proposals selected, most of which are integrated and multidisciplinary.

This first call was marked by a substantial rate of participation from the private sector, not only in the area of agro-industrial research (100% industrial penetration) but also in projects concerning primary agricultural production where the participation of industry has substantially increased compared with the previous Community programmes. Similarly, the key action particularly attracted the interest of SMEs, which account for 50% of the industrial partners in the projects selected.

The proposals selected are particularly relevant for supporting the common agricultural policy. With regard to fishery and aquacultural research, the 14 projects selected will contribute to different aspects of the common fisheries policy, in particular the management of fishery resources. The rate of response in the field "Monitoring and control of the common fisheries policy", which was new for this programme, was encouraging, even if only one single proposal could finally be selected. Lastly, for the sector "Economic and social bases of the common fisheries policy" the number and the quality of the proposals proved to be very satisfactory with a success rate of 50%.

Examples of projects launched in 1999

The project entitled "Development of the system for the optical detection of field crop diseases to reduce pesticides by targeted use" will help to make the environment healthier by reducing the doses of pesticides used. It uses a real-time, remote detection system capable of detecting diseases in arable crops at an early stage. They can therefore be treated as early as possible, while they are still only detectable in the form of spots in the fields, using much smaller quantities of pesticides.

Another project deals with the use of growth-promoting antibiotics in animal feed, which has been prohibited by the EU because of the risks to human health. At the moment, Community methods of analysis are based on non-specific microbiological tests which are sensitive to interference from certain food components and are therefore not very efficient. The aims of the project are two-fold:

– the development of immunoassay tests using innovative approaches which are more reliable, highly specific and less sensitive to interference than existing tests;

– the development of confirmation techniques using mass spectrometry for the sure identification and quantification of each antibiotic.

The participation of final users and political decision-makers, together with the performance of tests in collaboration with reference laboratories, will make it possible to check the effectiveness of the methods developed and their use.

Activities in 2000

In addition to the further evaluation and selection of proposals submitted, the emphasis is on the review of the work programme for 2001. In this context, three seminars have been arranged with the members of the EAG between February and April 2000 on the topics "Development of sustainable, competitive agriculture in Europe", "Forestry research" and "Rural development".

KEY ACTION 6: THE AGEING POPULATION AND DISABILITIES

Activities in 1999

The first call for proposals for the key action was the main activity for 1999. A total of 211 eligible proposals were received requesting an EU contribution of € 363 million. Following evaluation, 29 projects were selected for funding, with an estimated EU contribution of about € 41 million. More particularly the distribution of these proposals was as follows: 16 on age-related illnesses and health problems; 6 on the determinants of healthy ageing; 3 on the health and social care services; 3 on demography and epidemiology; and one for coping with functional limitations. Six projects target the aetiology of and novel forms of treatment for Alzheimer's disease and related dementias, others include projects on improved organisation and care delivery, enhanced outdoor mobility, patient involvement instruments to improve general practice care for older people, etc. The key action also financed 3 accompanying measures and 18 fellowships.

Furthermore, major efforts have been undertaken to involve all the stakeholders in priority setting and the implementation of the key action. In this context a workshop was organised in December 1999 with European NGOs representatives, in order to exchange views and define the ways of their active involvement in research activities.

Examples of projects launched in 1999

The *GENTLE/S* project will contribute to the development of a "robotised" means of physiotherapy for elderly persons in convalescence following a heart attack. The 12 European organisations involved in this project will study machine-assisted means of treatment not only from the scientific and technical viewpoint, but also from the viewpoint of their acceptability to elderly patients and practitioners. The potential long-term impact on the containment of health costs will also be evaluated. The treatment envisaged will be available at the patient's home, with a link to the clinical centre to allow a large degree of interaction. For example, the robot will be able to inform the centre about the patient's progress and make adjustments in line with the progress made. The stakes are extremely high, given that 700 000 Europeans are struck by cardiovascular incidents each year, two-thirds of them people aged 65 or over, and that recuperation for those who survive is long, arduous and often painful.

Alzheimer's disease, the main cause of dementia in the elderly, is increasing in terms of its medical, social and economic costs to European society and to families and carers. With related dementias, it affects 5% of people between 65 and 70, and 20% over 85, causing a progressive decline in cognitive and intellectual functions. No effective treatment or possibility of preventing or delaying its appearance exists at the moment. The seven partners from six European countries in the project selected will try to define new therapeutic strategies for preventing or delaying the development of the disease. Recent data seem to support the "inflammatory theory", according to which the neurolesions in Alzheimer's disease are partly caused by a local inflammatory response. This consortium therefore proposes to evaluate this hypothesis and to identify targets to enable the linkage between inflammation and neurodegeneration to be halted. This identification should lead to the validation and then the testing of pharmacological treatment strategies. The participation of a partner from the pharmaceutical industry confirms the importance and potential of this project.

Activities in 2000

The main activity for the year 2000 is the second call for proposals of the key action (deadline 15 March 2000). The work programme has been focused more towards the care of older people and the research necessary to underpin social and health policy in the face of the major demographic changes expected. The work programme also emphasises the importance of bringing together the research sector with the health and social care sectors and with representatives of older people and their careers.

Furthermore, in cooperation with the members of the Experts Advisory Group (EAG), a number of exploratory workshops are being organised on highly relevant issues of the ageing population. These workshops are being held with a view to combine and integrate European research efforts in the biological, biomedical, psychological, economic and social fields by raising the issue of "ageing" as a priority subject for top quality cross-sectoral multidisciplinary research.

RDT ACTIVITIES OF A GENERIC NATURE

Activities in 1999

A total of 387 proposals have been received by the deadline 1 June 1999 and 551 by the deadline 15 November 1999. For the first deadline, after evaluation and negotiation 64 proposals have been selected, representing an overall selection rate of 17.3%. The average funding per proposal was € 1.66 million.

Area 7 Diseases: the selected projects show a good coverage of the different research topics outlined within the work programme. They cover cancer research (9 proposals) cardiovascular research (6 proposals), diabetes (2 proposals), inflammatory / immune disorders (4 proposals) and rare disorders such as myopathies (3 proposals). Some of these projects are transdisciplinary, assessing fundamental mechanisms relevant to several disorders. As a whole, the proposals achieve a good integration of basic and clinical research in the various areas addressed.

Area 8 Genomes: 18 proposals were selected associating a total of 155 partners: 3 proposals in plant (*Arabidopsis*) functional genomics; 2 proposals in microbial (*Listeria, Bacillus subtilis*) genomics; 13 proposals in human/medical genomics and genome methodology development. Medical topics addressed include pancreas development and diabetes, autism, reproductive development, cancer, immunity and hereditary deafness. All projects include appropriate public dissemination of results. A medium-term result and application may be expected for example, by a project on functional genomics for diagnosis and treatment of microbial infections and mitochondrial myopathies.

Area 9 Neurosciences: 12 proposals were selected. In the area on cell communication, proposals include the development, application and commercial exploitation plans of new technologies which will bring novel and valuable tools to the neuroscience community. Two projects address an important issue in neuroscience: the understanding of signalling for death and survival in neurons. Other projects have been selected on neuroinformatics, and one project addresses a database generator for neuroimaging which is regarded as innovative and fully competitive with US funded neuroimage databases.

Area 10 Public health research - drug abuse: 3 proposals were selected, aiming at developing therapies in (illicit) drug addiction (cocaine, heroine, opioids in general), one at the receptor level and two in health economics and prevention.

Area 11 Disabilities: the sole proposal selected deals with the disability burden of mental disorders in Europe. It will estimate the prevalence and risk factors of mental disorder, assess their impact on disability and handicap, and evaluate the quality of mental health services in 4 European countries.

Area 12 Ethics: 5 proposals were selected reflecting a concern to develop methodologies in bioethics (empirical methods in particular) and to address public policy issues rather than specific technological developments. To this extent the funded projects will help to build the base on which continued and future bioethical work should be conducted, but will also help to integrate bioethics into the critical areas of science, medicine, research and public policy.

Area 13 Socio-economics: the sole proposal selected builds on the Eurobarometer public opinion fieldwork and provides interesting comparative social scientific research, critical examination of issues in the life sciences, their applications in medicine and food, and how these relate to media coverage and regulatory activities.

Examples of projects launched in 1999

"European cluster on the genetic resolution of myopathies": congenital muscular dystrophies are rare genetic diseases affecting the skeletal muscle, in particular in children, and are accompanied by motor disabilities and cardiac and respiratory complications. These rare or low-incidence diseases are a non-negligible cause of morbidity, mortality and early disability. From an economic viewpoint, they cannot be neglected since the medical counselling, diagnosis and intervention needed cost much more than is invested in more common diseases. The aetiology of a large number of these diseases is unknown, while prevention depends on basic knowledge being available. The fact that there are thousands of rare diseases with a low incidence and that limited budgets are devoted to scientific research means that cooperation between Member States and work at Community level in this field are essential. In this context, the aim of the project is to evaluate the clinical, biochemical and genetic characteristics within a population of patients affected by two forms of muscular dystrophy. A detailed knowledge of how these diseases develop and their genetic bases will make it possible to improve diagnosis and the assistance given to patients and will facilitate the work of families and groups assisting them.

"Ethical questions in clinical tests carried out in collaboration with the developing countries": the ethical questions raised by research carried out in developing countries are very important and very difficult to resolve, as shown by the difficulties with clinical tests for Aids in Africa and Thailand. Firstly, this research involves individuals who are vulnerable because of the economic and social context. Secondly, researchers are faced with the problem of the differences between attitudes in their country of origin and those in the developing countries. Because of their European and often international nature, EU research programmes have to respond to ethical questions. The aim of this bioethics research programme is to draft an ethics manual which can be used by the funding agencies, the members of ethics committees and researchers involved in research projects in collaboration with developing countries where these research projects are likely to raise ethical questions.

Activities in 2000

In addition to the further evaluation and selection of proposals, the emphasis is on the review of the work programme for 2001. In this context, four workshops with the members of two high-level expert groups have been organised on the topics: chronic and degenerative

diseases, genomes, neurosciences, public health, disabilities, bioethics, and socio-economic aspects.

SUPPORT FOR RESEARCH INFRASTRUCTURES

Activities in 1999

An open Call for Proposals was published on 6 March 1999 with two initial cut-off dates in 1999. The indicative budget available for both cut-off dates was €20 million. Because this type of "research infrastructures" action is new to most of the life sciences, it was expected that only a limited number of proposals would be received on the first deadline, and that therefore less than half of the budget available for this deadline would be committed. As a result of the 1999 evaluation procedure, a total of 5 proposals have been selected out of 15 evaluated, with an average funding per proposal of € 0.915 million.

The selected proposals provide important resources to the bioscience research community at large. They focus on "steroids in health and disease", "development of a network of cancer family syndrome registries in Eastern Europe", "comprehensive yeast genome database", "a European transgenic and experimental pathology database and teaching facility", and "European comparative genetic resource".

Considering that this is the response to the first cut-off date of the first call for proposals in the new programme, the priority list reflects the involvement of European infrastructures operators and users who are supporting the research priorities of the "Quality of Life" work programme.

* * *

Examples of results of the 4th Framework Programme

The project “Functional food science in Europe" has made it possible to establish a European multidisciplinary network, the result of which has been the strict evaluation of the scientific basis required to show that specific foods and food components may have beneficial effects on health. These results have played a major part in highlighting this field of growing interest in Europe.

The Biotech demonstration project on high cell density bioreactor aims at producing therapeutic proteins in large amounts, fast and at competitive prices. Mammalian cells used for the production of therapeutic proteins are cultivated by tremendously expensive industrial bioprocesses which have a strong impact on the costs and the quality of the biologicals during the downstream processing. This project aims at demonstrating on a pilot scale the technical feasibility and economic advantages of a mammalian cell-dependent bioprocess interlinking high cell density and ultra-fast on-line downstream processing. Preliminary results with this new bioprocess show that it is possible to obtain gram quantities of a particular protein with a very high degree of purity in only hours.

A user-friendly Information Society (IST Programme)

Key indicators	Proposals received in 1999		Proposals selected for funding in 1999		Contracts signed on the 1999 budget	
	Number	Contribution Requested (million €)	Number	Contribution proposed (million €)	Number	Contribution granted (million €)
Shared cost actions	2 391	5 055.18	460	863.82	416	738.91
Grants	39	7.48	10	2.89	10	2.89
Support to networks	29	35.83	5	4.64	6	5.12
Concerted actions	23	723.12	8	4.77		
Accompanying measures	202	310.91	67	58.79	42	47.74
TOTAL	**2 684**	**5 432.52**	**550**	**934.91**	**474**	**794.66**

The strategic objective of the Information Society Technologies (IST) Programme is to reap the benefits of the Information Society in Europe, both by speeding up its arrival and by making sure that the requirements of private individuals and businesses are met. The programme consists of four key actions focused on specific objectives, added to which are an activity concerning research on future and emerging technologies and an activity on the interconnection of research networks. These activities are complementary and are a cluster of several technologies, systems, applications and service.

The four key actions concern systems and services for the citizen, the new working methods and electronic commerce, multimedia contents and tools, and essential technologies and infrastructures. “Transverse” actions are also included in the programme structure to boost the integration of the activity; they are concentrated on a limited number of topics which concern all of the IST Programme. “Clusters” are used to focus, coordinate and integrate the performance and results of the projects.

The programme as a whole places emphasis on the key factors for the Information Society, which are: ease of use, interoperability, reliability and an affordable price.

Implementation of the 1998 recommendations of the external monitoring panels

The IST Programme has attached importance to the best possible implementation of the 36 or so recommendations made by the panels monitoring the ESPRIT, ACTS and Telematic Applications programmes for the 1998 year. A detailed report, the main points of which are summarised below, has been sent to the monitoring panel for the IST Programme for 1999.

All RTD subjects recommended by the ACTS panel have been taken into account and the work programme has been prepared on the basis of the twofold approach suggested: a top-down approach via the contribution of the independent advisory group (ISTAG) and a bottom-up approach with consultation of the groups concerned to assess how the subjects adopted meet market and societal needs.

In accordance with the recommendations made for ESPRIT, the selection criteria are applied consistently to all the IST Programme and take account of the level of risk attached to each project; the proposals and contracts have objectives which are set so as to allow their attainment to be monitored; the technological implementation plan (TIP) makes it possible to monitor the exploitation of the results obtained during and beyond the performance of the project.

Lastly, in accordance with the recommendation of the Telematics Applications panel, the actions for the dissemination of the results, project concertation, the participation of industry in the projects and the consideration of innovation have been stepped up.

All the recommendations regarding programme management have been taken into account in the light of the difficulties encountered during 1999 and the improvements planned for the year 2000.

Principal recommendations of the 1999 external monitoring panel

The panel stressed the good performance of the IST Programme in 1999 in successfully launching the first calls for proposals and carrying out the evaluation and selection of the proposals received, despite the very short deadlines and a climate of profound change. However, it made the following main recommendations:

- to specify the objective of "integration" by formulating clear, measurable implementation criteria;
- to improve the management structures of the programme and to put in place, in particular, a communication action plan;
- to indicate to consortia clearly and in detail why their proposals have not been selected
- at the Framework Programme level, to make the procedures more flexible and user-friendly, particularly for SMEs whose participation should be more systematically encouraged;
- to clarify the various evaluation criteria and adapt them better to each key action.

The main aims of the 1999 work programme of the IST Programme were to improve the user-friendliness of the Information Society and to achieve integration and convergence between the fields of information processing, telecommunications and content. The revised work programme for 2000 is based on the experience of the first call for proposals and takes account of the projects adopted which are currently being implemented. Like its predecessor, it has been prepared in close collaboration with the scientific groups, firms and users concerned, with the assistance of the IST Programme Advisory Group and the Management Committee, and taking account of EU policy objectives. The programme has therefore identified a set of focal directions for the work in 2000 and beyond which place the needs of the user, i.e. the citizen, at home, at work, in leisure or commuting, at the centre of future developments.

The vision on which the programme directions are based is very simple: "our environment is the interface", i.e. a universe of integrated services by means of which citizens will be able to access Information Society technology services wherever they are, whenever they want, and in the form that is most "natural" for them. While directly targeting the improvement of quality of life and work, the vision is expected to catalyse a vast array of commercial and industrial opportunities which will strengthen the position of Europe in key areas.

Three calls for proposals are planned in 2000. Key actions 1, 2 and 3 will be chiefly covered in the first two calls, while key action 4 will be chiefly covered in the last two calls. The other activities will be spread over the three calls.

KEY ACTION 1: SYSTEMS AND SERVICES FOR THE CITIZEN

Activities in 1999

Key action 1 is directed towards the new services for citizens allowed by the advances in the Information Society technologies. To target the financial effort, five strategic fields are tackled: health, people with special needs (in particular elderly and disabled people), the authorities, the environment, transport and tourism. The emphasis is on the development of innovative systems which themselves provide value-added services and on the user-friendliness and functionality of these systems to ensure their ease of use, interoperability and "acceptance" by users.

The first call for proposals launched in March 1999 marked a certain continuity with respect to the "Telematics Applications" Programme in the 4th Framework Programme. In most of

the fields covered, in particular health, the environment and transport, the projects adopted contain a high degree of technological innovation and are accompanied by firm plans for their exploitation. In addition, industrial participation has significantly increased, which should ensure the promise of faster dissemination, exploitation and take-up of the results of the research.

The work within key action 1 is being carried out in close cooperation with other relevant activities and programmes: "Quality of Life and Management of Living Resources" for the telematics applications for health or at the service of people with special needs; "Energy, Environment and Sustainable Development" for the telematics applications at the service of the environment: "Competitive and Sustainable Growth" for the telematics applications in the field of transport.

Furthermore, key action 1 is intended to play a major role in the "e-Europe" initiative launched in December 1999; Four of the ten priority fields of action are directly concerned with RTD work carried out under this key action: "participation of the disabled", "online healthcare", "intelligent transport" and "online government".

Examples of projects launched in 1999

Transport: "Pre-crash application all around the vehicle" (CHAMELEON): every year, 1.2 million accidents on European Union roads result in 1.6 million injuries and 42 000 deaths. Recent studies have shown that a substantial number of lives could be saved each year and the number of people injured reduced by 120 000 simply by fitting passive safety devices to vehicles to minimise the consequences of impacts to passengers. This very positive potential could be enhanced even further by adding a system of sensors capable of detecting when an impact is about to occur. The principal objective of the CHAMELEON project is to define, develop and validate a new generation of sensors of this type. Such equipment could, for example, allow the tension on safety belts to be altered during an impact to make a collision less violent, or vary the rate of inflation of the airbag. The results of this research could be on the market in 2005.

Health: "Minimal invasive interventional imaging" (MI3): with the knowledge acquired over the last five years in the field of computer-assisted surgery under the Telematics Applications programme, European teams are continuing to increase their share of the world market in this field and are developing dedicated equipment, e.g. for orthopaedics or neurosurgery. The new MI3 programme should meet the latent demand of more than 15 000 orthopaedists and more than 500 000 dentists for a high-performance, computer-assisted microsurgery station. Given the achievements so far under the 4th Framework Programme and the calibre of the partners involved in this new project, there is every reason to believe that this work, which has a timetable of three years, will be successful.

Activities in 2000

The work programme for the year 2000 provides for clearer focussing of the lines of action and places greater emphasis on innovative applications which will represent a significant advance compared with the state of the art. The "ambient intelligence" paradigm, based in particular on "ubiquitous" informatics and communication and on intelligent interfaces, is fully integrated in the description of the new work lines.

KEY ACTION 2: NEW METHODS OF WORK AND ELECTRONIC COMMERCE

Activities in 1999

The activities under this key action are guided by the strategic vision of the IST programme: a global economy functioning as a network in which consumers, workers and businesses will be able, seamlessly and dynamically, to contact each other and interact through a ubiquitous infrastructure in which they have confidence. Against this background, the key requirements concern the research and development of architectures and solutions emphasising the functions of use, interoperability, scalability, personalisation, multilingualism and operational security, with the user at the heart of the concept.

In 1999, efforts were made to publicise the key action throughout Europe in order to ensure the success of the first two calls for proposals. These efforts have borne fruit since 470 proposals have been submitted following the first call, with a balanced representation between Member States and a high level of participation of businesses, including SMEs. A second call was published in October 1999.

Key action 2 also organised, in May 1999 a European day of awareness about teleworking and contributed to a number of political initiatives such as the Community directive on electronic signature and the thinking on authors' rights. The key action is also associated with the Commission's work on topics such as electronic commerce, standardisation and respect of privacy. Lastly, it is responsible, together with the "Competitive and Sustainable Growth" Programme, for the management of the "Intelligent Manufacturing Systems" (IMS) initiative, for which it provides the secretariat. This initiative led to a call for proposals in March 1999 followed by an evaluation in the summer.

Examples of projects launched in 1999

The aim of the CHAINFEED project is to develop the planning and cooperation tools needed to set up supply and control networks for livestock feed. The intention is to optimise the composition and distribution of feed for animal growth. The basic ingredients will be mixed according to the type of animal, its age, its condition and the growth profile sought. The system is to incorporate the control and transportation of ingredients, quality control, mixing according to various factors, the delivery of the feed in good time and distribution to the animals as and when required.

The E-Tailor project is aimed at developing new infrastructures to revolutionise online wholesale services in the ready-made clothing industry. The project will contribute to the European harmonisation of size standards in the clothing industry and make it possible to produce and distribute genuinely made-to-measure clothes at reasonable prices and as soon as possible. The project will create an innovative virtual infrastructure in which clients will be able "virtually" to try on the clothes offered by shops on the Internet. Clients will have electronic cards at their disposal which will contain all the data needed for their future clothes purchases (morphological data, etc.), while ensuring confidentiality.

Activities in 2000

In 2000, the key action will evaluate the proposals submitted in response to the second call for proposals in 1999 and will also launch three calls based on its new work programme. This forms a coherent set of activities covering RDT, the adoption of technologies, support measures and socio-economic analysis. The RTD work is structured along four action lines: "sustainable workplace design", "intelligent organisations", "dynamic value creation constellations" and "confidence-building"; and two transverse topics: "knowledge management" and "mobility and ubiquity". Key action 2 is also present in all the transverse actions of the IST programme, in particular those on the "robustness of major systems" and

"chip cards", which it manages. Finally, an annual conference to bring together all the projects under the key action is planned for October 2000 in Madrid.

KEY ACTION 3: MULTIMEDIA CONTENT AND TOOLS

Activities in 1999

The strategic objective of key action 3 is to confirm Europe as a pioneer in this field by encouraging the full achievement of Europe's creative and cultural potential.

The set of actions adopted on the basis of the 1999 calls for proposals will make a major contribution to both the research objectives and the policies concerned. It will in particular encourage: the convergence of the methods of production and transmission of the new media by cable and over the air; the competitiveness of information and communication businesses, particularly in high-growth markets such as transactional communication systems, services and equipment; harnessing the creation and innovation potential of SMEs in the Internet sector, which account for more than 50% of participants in some action lines; the creation of multimedia catalogues for both the general public and professionals; the joint development of new educational contents and services in Europe and throughout the world.

The key action also attracted proposals from more than 30 non-member countries during the first call, in particular the candidates countries, the USA and Israel. The key action has created the basis for transatlantic cooperation in research on distance learning and access to multilingual information, in particular thanks to the synchronisation of its calls for proposals with those of the US National Science Foundation.

Following the recommendations of the 1998 external monitoring panel, the task force on multimedia learning has prompted the creation of numerous new activities: a joint declaration of intent on access to education and training in Europe has been signed by 450 bodies and several interest groups (www.prometeus.org); new mandates for the standardisation of learning technologies have been given to CEN; and a joint action with the Directorate-General for Education and Culture has been included in the "e-Europe" initiative to prepare youth for the digital age.

Examples of projects launched in 1999

The CATCH-2004 project will develop a multilingual dialogue system with an innovative architecture capable of adapting to all types of services and equipment (Internet, telephone, kiosk services, etc.). The aim is to provide users with personalised, interactive information in the language of their choice. This will also cover multimodal services, both written and oral, involving a word recognition module, among other things. The system will be tested in particular at the Athens Olympic Games in 2004. Trilingual services (English, German, Italian) will be developed for the financial services industry and for tourism.

The ECHO project (European Chronical on Line) includes among its partners some of the most important documentary archives in Europe. The project aims to utilise their resources by creating a library divided into numbered films accessible via the Internet. For this purpose, it will develop a long-term, reusable software infrastructure to classify the digital video archives, to allow access via the Internet as well as to increase the productivity and profitability of the production of digital video archives.

Activities in 2000

The priorities for 2000 are drawn from the recommendations of the Expert Advisory Group (ISTAG), which stresses the requirements of user-friendliness and multimodality of, personalised access to and convergence between contents transmitted by Internet and over the air. Actions for project alignment, concertation, and the promotion and dissemination of research activities will also be undertaken.

KEY ACTION 4: ESSENTIAL TECHNOLOGIES AND INFRASTRUCTURES

Activities in 1999

Key action 4 is devoted to the development of the essential technologies which underpin the fully converging industries and infrastructures for basic components, integrated systems and infrastructures. The key action is also intended to speed up the exploitation of the technologies and infrastructures and to extend their field of application.

The strategic objective is twofold: firstly, to encourage the widest possible access to the interoperable, essential infrastructures and services which will support the next generations of applications; secondly, to ensure continuity in convergence, interoperability and synergy at all technological levels. In this way, the essential technologies and infrastructures act both as promoters and initiators of applications creation.

The RTD results, together with appropriate accompanying measures, will also provide information about the consequences of the development of the new technologies and the introduction of EU policies, e.g. on telecommunications regulation, frequency spectrum management and standardisation.

The activities in the key action are being carried out in close cooperation with other activities and programmes, in particular the "Competitive and Sustainable Growth" Programme (key action "Innovative Products, Processes and Organisation" and the generic action on materials in the fields of microsystems, screens and sensors).

Examples of projects launched in 1999

The aim of the CLARIFI project is to create technologies which will allow the brokerage of software components. The underlying model is the development of software for component assemblies. A large choice of components which can be assembled for the development of various applications should soon be available on the market. Three types of players are taking part in this process: component suppliers, integrators and the brokerage system. The latter assists the integrators in their task (i) of identifying the components required for the construction of a given application, (ii) of assembling these components and (iii) examining the relative value of various solutions. The development of the brokerage system requires research and development on various aspects: component classification, certification, description of their origin and past use, and evaluation of their quality and relevance for particular applications.

The down-loading of music in the form of MP3 files, a very popular activity among the new generation of young internauts, is proof of the growing importance of the technologies for online access of multimedia contents. However, the fact that such downloading takes place without any royalties being paid justly concerns content creators and could slow down the deployment of new multimedia transmission systems such as digital television. The OCCAMM project is looking for solutions along the following lines: (1) the specification and development of tools and components which are compatible with the open standards and will ensure secure access, the distribution, the "consumption" and the management of multimedia information rights; (2) the establishment of a number of commercially credible applications, such as the distribution of music online, using these tools and components; (3) testing of these applications with final users.

The passive components are the main obstacle to increasing the level of integration and functionality of radio frequency (RF) transceivers for radio communications. The research in the MELODICT project is based on micro-electromechanical components (MEMS) which can replace the present passive components in RF transceivers to attain a higher level of flexibility, programmability and integration. The components to be developed are variable capacitors, mechanically configured miniaturised switches and micro-mechanical filters for intermediary and radio frequencies (IF and RF). The aim is to take this technology out of the laboratory and put it into broad industrial use. In this project, the following topics will be developed: the cointegration of MEMS with integrated circuits having the same silicone substrate, mass production compatible with assembly technology and an innovative RF transceiver architecture using new components.

Activities in 2000

The aim of the 2000 work programme for key action 4 is to create an "ambient intelligence environment" on the basis of the solid foundation created by the 1999 work programme. In order to create the ubiquity of information and communications processing with integrated and networked information systems (cable or otherwise), attention is focused on integrated, adaptable, large-capacity networks and on high-consumption items and the equipment capable of communicating between them. The activities concerning open technologies for personalised services - regardless of time, place or context - focus on the technologies and infrastructures needed for supply of and access to end-to-end, value-added network services.

GENERIC RTD ACTIVITIES

Activities in 1999

The generic RTD activities include "future and emerging technologies", the "trans-programme" actions, including the "clusters", and several support measures for coordination with the horizontal activities of the Framework Programme.

The projects selected for the "future and emerging technologies" include research which has long-term prospects or particularly high risks, offset by the promise of significant progress and a major impact on industry and society. To this end, two types of activity have been organised: firstly, an area permanently open to any proposal not covered by the other actions in the programme; secondly, "pro-active actions in three emerging, promising areas for the information technologies: "communications and quantum processing of information" "universal information ecosystems" and "nanotechnology information devices". In all the cases, the aims of interdisciplinarity and links between academia and industry have been attained.

The "transverse topics" contribute to cross-fertilisation and the synergies between the subjects in the IST Programme to make it a completely "integrated" thematic programme. In the activities linked to the transverse topics, the subjects cutting across more than one key action are treated coherently in as much as each key action concentrates on its own perspective and will contribute to the overall progress from that specific perspective. The transverse topics are dealt with by means of transverse actions and "clusters". The transverse actions call for proposals on specific lines of action covering more than one key action, while the clusters support *a posteriori* the bringing together of the objectives and work of existing projects.

Examples of projects launched in 1999

Long-distance quantum phototonic communication (QUBITS project): progress in the miniaturisation of electronic circuits will soon come up against the physical and economic boundaries of present technology At their boundaries, the laws of nature are no longer conventional but become quantum. Some projects try to take advantage of the quantum behaviour of matter to further increase integration density while increasing computing power in a spectacular manner and reducing the electrical consumption of components. The architecture of such future circuits and systems will be radically different from conventional architectures. Quantum systems will not operate in accordance with a binary, deterministic logic, but on the basis of the superposition of all the possible quantum states. The research focuses on the design and development of quantum gates, based, for example, on ions or atoms, and on the fundamental physical properties of such circuits in order to manage their programming, their control and the correct interpretation of the results.

The MOEBIUS project is concerned with the development of cordless Internet technologies as a way of extending "intranet" networks (within an organisation) to "extranet" networks which are accessible from outside by certain users. The aim is to develop platforms in the fields of health, the pharmaceutical industry and electronic commerce which transparently and seamlessly provide interlinked service packages to users on the move. The consortium is made up of university research centres, suppliers of software and equipment as well as users, enabling demonstrations to be carried out with the final users of the results.

Activities in 2000

In 2000, the open field of "Future and emerging technologies" will continue to receive all particularly innovative proposals which are not directly covered by one of the key actions. However, two new pro-active actions will be launched. The first, the "vanishing computer" should encourage the design of new items which mutually interact and facilitate everyday life with technology that is more transparent for the user that that of current computers. The second, in "neuro-informatics", is intended to bring together researchers in the fields of the neurosciences and in the field of the information technologies in joint projects with a high innovation potential. The 1999 work programme included four transverse action lines covering important subject such as "platforms for the integration of services and applications" and the reliability and safety of systems and infrastructures". In the 2000 work programme eight transverse actions are planned covering interlinked topics such as natural interactivity, ambient intelligence and the home environment, mobile integrated services platforms and the convergence of infrastructures.

SUPPORT FOR RESEARCH INFRASTRUCTURES

The support actions for research infrastructures in the IST Programme are broadly devoted to the research networks. In 1999, the programme launched the first calls for proposals for experimental platforms. Furthermore, most of the efforts have been devoted to preparing the interconnection of the education and research networks to upgrade the infrastructures set up during the fouth Framework Programme with the QUANTUM project. The capacities and services renewal and upgrading will take place during the course of 2000 to provide European researchers with a world class network and to guarantee the continuity of the service. In the meantime, to cope with the sharply rising use of networks by all research sectors, the TEN-155 capacities have been increased to 622 Mbit/s. To support technological and multimedia applications experimentation, net services have been operationally introduced such as the supply of on-demand and multi-diffusion capacities.

A new action is aimed at developing professional expertise in the academic disciplines concerning information and communications technologies. This action, “Improving human capital in ICT research" attaches major importance to exchange and interaction between research infrastructures and/or industries working in the field. This form of transfer of scientific knowledge, with the training aspect which it includes, is essential for “passing on” scientific messages and is an important factor in the effectiveness of the research infrastructures in terms of the dissemination of results.

* * *

Examples of results of the 4th Framework Programme

ALBATROS has developed a new electronic labelling technology to meet the operational needs in distribution applications. The system is based on radio frequency identification technologies and incorporates technological developments in integrated circuits (ASICs). It covers labelling itself, the read-write equipment and the information system.

EUROVET is a trans-European system which records and monitors the movements of livestock to ensure their traceability. It also stores data on significant events in the animals’ lives and their veterinary records.

FREE answers the question: How can collaborative work between commercial partners be improved? On the basis of an organisational model, a virtual organisation is firstly analysed by static evaluation and dynamic measurement of the operation. Analysis of the results produces data enabling a structured improvement programme to be devised.

GLOBALMAN 21 shows how to transform global manufacturing practices with rigid structures into global, dynamic distribution networks for agile enterprises.

MACRO has devised a methodology and prepared a set of software for the storage of electronic data from multiple sites participating in medical experiments. The implementation of the project was based on a group of users involved in the fight against cancer.

SPOEC is a commercially available standard system and personalised diode laser structure for optical communication, optical interconnections and centres.

VANGUARD and RESOLV are systems which contribute to total immersion in virtual reality applications. On their basis, faster solutions using 3D cameras have been tested by the PANORAMA and MIRAGE projects, e.g. a videoconferencing system during remote surgical operations.

QUANTUM is a project established jointly by ACTS, Esprit and Telematic Applications in collaboration with the national research networks and launches a trans-European network, joining the national research networks.

WAI (the “Web Accessibility Initiative”) has brought together industry, organisations for the disabled, researchers involved in questions of accessibility and the authorities to analyse the needs regarding these questions and to find solutions.

Competitive and sustainable growth

Key indicators	Proposals received in 1999		Proposals adopted for funding in 1999		Contracts signed on the 1999 budget (up to 31.03.2000)	
	Number	Contribution requested	Number	Contribution proposed (million €)	Number	Contribution granted (million €)
Shared cost actions	1 438	2 407.17	464	702.03	296	532.33
Grants	44	10.03	12	2.74		
Support to networks	56	86.60	19	21.61	8	11.07
Concerted actions	4	4.39				
Accompanying measures	104	125.27	24	52.68	11	41.07
TOTAL	**1 646**	**2 633.45**	**519**	**779.06**	**315**	**584.58**

After only one year of operation, the programme has to a large extent achieved the bulk of its main strategic objectives. It has succeeded in stimulating a large number of projects which are resolutely searching for answers to clearly identified socio-economic needs. In this sense the concept of key actions has proved effective. Moreover many of these multisectoral projects have succeeded in mobilising sufficient critical mass to complete research contributing to both competitiveness and sustainability. The objective of grouping and integrating targeted projects has therefore been achieved in part and even more progress should be made in the future. This is particularly true in the transport sector, where the economic stakes are considerable for Europe, whether in terms of means of transport or intermodality. The increased cooperation between European enterprises is a very positive result of the programme since it concerns areas of technology where the search for European added value is an absolute necessity. Naturally, the objective of all the projects is the growth and competitiveness of European industry. In addition, however, the creation of new jobs, the environment, safety and working conditions figure among their other main objectives.

Implementation of the recommendations of the 1998 external monitoring panel

To improve the quality of decentralised information, a network of national contact points has been set up. It has also been given Extranet access which allows the exchange of information on line with EC departments.

Studies on the impact of RTD projects are continuing in order to evaluate and measure the effectiveness of the programme. The nature of the information collected and the evaluation criteria have been improved and expanded in number.

A period of four months elapsed between the closure of the first call for proposals under the programme and the agreement of the programme committee on the first contracts, in October 1999. The procedures established for the 5th Framework Programme should enable approved projects to start more quickly.

Along the lines of the expert advisory groups for the key actions, an expert advisory group has been set up specifically for the measurement and testing activities under the programme. The aim is to enable European professional and commercial interest groups to coordinate their attempts to identify the needs of those industrial sectors which have little or no contact with standardisation bodies.

Main recommendations of the 1999 external monitoring panel

The monitoring panel considered that the transition from the 4th to the 5th Framework Programmes was well managed and that the conclusions of the previous monitoring report had been followed up on the whole. The recommendations of the 1999 panel covered the following in particular:

- a clear distinction between the objectives of SME participation on the one hand and strategic research projects on the other;

- harmonisation of the management procedures and tools and dissemination of better practices, with a view to a simplification and speeding up of procedures;

- improving the possibilities of terminating a project which is unsatisfactory;

- systematisation of project reports, even for those which have "failed";"

- promotion of longer term research or research involving more risks;

- need for a degree of continuity for the next Framework Programme.

In 1999, activities were largely focused on the operational implementation of the programme: finalisation and review of the work programme, first calls (periodic, targeted and open) for proposals, evaluation and selection of projects, preparation of contracts.

Through the recommendations and opinions of the four expert advisory groups, those involved in the activities of the programme have helped to finalise and then review the work programme before its presentation to the Programme Committee. The latter met five times and issued favourable opinions both on the initial and revised work programmes and on the projects recommended for funding by the Commission.

The group of Directors responsible for the programme and for the policies concerned (industry, transport, energy, environment, telematics) focused its activities on three main objectives: coordination of actions in the field of transport in particular as regards energy and environment aspects, effective coverage of socio-economic aspects in the work programme and projects and improved integration of telematics activities.

In 2000, the programme activities will be geared to opening up exploratory debates and analyses in line with the pointers given by the Commission communication on the European Research Area.

KEY ACTION 1: INNOVATIVE PRODUCTS, PROCESSES AND ORGANISATION

Activities in 1999

The priority objective of this key action is to increase European competitiveness in the context of sustainable growth. The first projects approved in 1999 focus on:

- high technology products geared to user needs;
- new and miniaturised products and processes;
- new systems, equipment and machines for manufacturing;
- environmentally friendly, “zero waste” industrial manufacturing and treatment processes.

These projects combine an innovative character with technical quality. Their industrial innovation potential for products with a higher added value means that more skilled jobs will be created. Finally, these products always take account of the need to ensure or increase safety of workers.

The key action therefore helps to reinforce the technological bases of the industries of the Member and associated States and to increase their international competitiveness. Moreover, with the "Intelligent manufacturing systems" initiative, the growth and information society programmes have been opened to participation by the developed countries in Asia, America and Oceania.

Examples of projects launched in 1999

The "Intelligent Column Internals for Reactive Distillation" project involves fifteen enterprises, universities and research centres in seven member or associated states, with the objective of more economical use of resources and greater safety at chemical and pharmaceutical sites. The aim of this project is to improve chemical and pharmaceutical processes through a combination of chemical reactions and processes for the separation of the products resulting from those reactions. This involves an "intensification" of industrial processes reducing the number of synthesis stages while increasing the total yield of chemical reactions.

"Multiuse and multisectoral modernisation of manufacturing processes through parallel operating mechanisms": with this project, eleven partners from five Member States are aiming to develop an innovative solution (industrial machines with parallel operating mechanisms) which would significantly improve the capacity and ability of European firms to produce solutions adapted to the consumer. The project will have a direct impact on the machine tool industry, but the results could easily be transferred to other types of machine.

Activities in 2000

In 2000, two calls for proposals are planned. The first is targeted on:

- a new generation of industrial machines,
- the extended, knowledge-based enterprise,
- modern, flexible industry geared to consumers and "zero waste";
- ever safer civil infrastructures, and industrial buildings and installations,

and the second will focus on new miniaturised products and systems with a higher added value and lower consumption of resources.

In addition, the expert advisory group for the key action will undertake a wide ranging study of the research, innovation and training actions needed for European industry to become more competitive in the longer term. Specific workshops will be organised with the participation of other experts.

KEY ACTION 2: SUSTAINABLE MOBILITY AND INTERMODALITY

Activities in 1999

The reasons for this key action are the ever increasing demand for transport and the problems associated therewith (congestion, accidents, pollution), as well as EU challenges such as completion of the single market, enlargement, trans-European transport networks, meeeting

the Kyoto commitments concerning emissions, etc. The key action seeks to provide the tools, methods and systems capable of meeting these challenges and overcoming these problems, particularly by improving the efficiency and safety of the European transport system while reducing its negative environmental and social impact.

Three research areas have been identified: the development of socio-economic scenarios for better comprehension of mobility, research into infrastructures and their interface with their means of transport, and transport management systems.

The first call for proposals in 1999 focused on the following themes: the definition phase for the Galileo Programme (second generation global satellite navigation system); a work programme for the validation phase for a new air traffic management platform (ATM); demonstration of urban transport tariff fixing; a group of projects on transport emissions; quality of transport, particularly quality maritime transport. In addition, 18 thematic networks will ensure coordination between existing and future projects in a number of key transport fields.

The key action organised a major event in order to disseminate the results of the RTD programme on transport under the previous Framework Programme: a conference on transport research which was held in Lille in November 1999 with more than 700 participants.

Examples of projects launched in 1999

Fair and effective tariff fixing for the use of transport infrastructures is a fundamental aspect of the development of a sustainable transport policy which takes account of all the costs and social benefits of transport. To this end, the UNITE project (unification of accounts and marginal costs for transport efficiency) has three main objectives: (1) to draw up pilot transport accounts for all means of transport and all European countries, including those applying for accession; (2) provide a complete set of marginal cost estimates for the various means and countries; and (3) provide a global framework for the integration of these accounts and marginal costs. These objectives will be achieved by a European research team comprising a significant number of world leaders in the development and application of estimation techniques.

The general objective of the PROGRESS project is to demonstrate and evaluate the efficiency and acceptance of integrated urban toll systems in achieving transport policy objectives and raising revenue. This project therefore supports the common transport policy of the EU. It will focus in particular on an assessment of the public and political acceptance of urban toll schemes in practice; and of the effectiveness of such schemes in achieving social and transport objectives. Road pricing concepts and technologies are being tested in seven cities: Bristol, Rome, Trondheim, Edinburgh, Copenhagen, Genoa and Gothenburg, with Helsinki as an associated city. To support the principle of tariff fixing at marginal cost, certain cities will also endeavour to ensure that road pricing structures and methods of payment are in line with those for public transport and parking.

Activities in 2000

Two calls for proposals are planned in 2000. All the research areas will be covered with particular emphasis on the following: validation of an operational platform for air traffic management; improved safety in tunnels, development of an information system on European transport policy (ETIS); demonstration of freight intermodality concepts. The key action will also continue the dissemination of results emerging from the 4th Framework Programme.

KEY ACTION 3: LAND TRANSPORT AND MARINE TECHNOLOGIES

Activities in 1999

This key action of the Framework Programme has a budget of €320 million.. It is based on the relationships between the development of the technological bases ("critical technologies") and the integration and validation of the results ("technological platforms"). Its research areas are determined above all by the socio-economic impact of R&D, in particular safety, pollutant emissions, noise pollution and the competitiveness of the industrial fabric. The synergy between the various means of transport covered by the key action brings significant added value.

The results of the first call for proposals in 1999 showed that in terms of environmental protection, there is no alternative to the further improvement of internal combustion engines. On the question of maritime transport safety, the call also showed that approaches based on formal analysis and probabilities are in the process of replacing the use of purely experimental data. In the field of rail transport, the study on the interaction between road and rail is one of the keys for noise reduction and optimum operational stability.

a

Examples of projects launched in 1999

The ART-DEXA "Advanced Regeneration Technologies for Diesel Exhaust Particulate Aftertreatment" project has a budget of €4 million and involves car manufacturers, equipment suppliers and research centres. The project is aimed at the elimination of carbon particles and heavy metals from exhaust gases. This type of pollution is at the heart of the problems linked to the boom in diesel engines given the risk that it represents in public health terms.

The main aim of the HARDER project is a systematic investigation of the current regulations (based on a probabilistic approach to the stability of a damaged vessel) on the safety of existing vessels and on the development of vessels of a new design for the transport of cargo and passengers. The results of this project could make a significant contribution to the formulation of a concrete proposal to the International Maritime Organisation (IMO) for formal adoption by 2001. In prenormative and prelegislative terms and as a support for the policy decision, this RTD project is therefore very important.

Activities in 2000

The second call for proposals will have a budget of € 100 million and cover all the "critical technologies" of the key action as well as two "technological platforms". Strategic research axes for this core are, for example, assistance for driving to improve safety, technological integration and validation to reduce greenhouse emissions and also technologies for effective freight handling in intermodal transport.

There will also be provision for aid for SMEs. A CRAFT stimulation action for maritime transport is being prepared and will be launched in 2000.

Moreover, new thematic networks grouping RTD projects for the last call for proposals will be set up. Particular mention should be made of the launch of a thematic network on the optimisation of internal combustion engines for commercial vehicles and heavy goods vehicles: this type of vehicle is responsible for at least 50% of the emissions from road traffic in Europe.

KEY ACTION 4: NEW PERSPECTIVES FOR AERONAUTICS

Activities in 1999

The aeronautics key action has a budget which is up sharply (€ 700 million) from the previous Framework Programme, and is resolutely targeted on the expectations of the European citizen. Its priority aims are European competitiveness in terms of the production and operational performance of aircraft, air safety and environmental protection.

The key action is based on complementarity between the research projects on the "critical technologies" for the development of the technological bases and the "technological platforms" for the integration and validation of technologies which involve all the main European players.

In the field of critical technologies, the projects selected in response to the first appeal cover all the objectives of the key action in a balanced manner with the highest proportion on improvements to aircraft performance, somewhat fewer on the environment and safety, and fewer still on development costs and delivery times.

The four technological platform projects selected cover three of the four themes of the key action: engines, structures and air traffic management.

The long-term fundamental research areas are also covered satisfactorily.

The number, quality and broad thematic cover of the projects attests to the merits of the approach of the key action, particularly the technological platforms.

This is encouraging for the further implementation of the key action, in particular in the context of greater international competition in the aeronautics sector.

Examples of projects launched in 1999

The European aeronautics industry is harnessing its strengths, resources and talents in the largest RTD project ever funded by a Community programme in this area: the "Efficient and Environmentally Friendly Aircraft Engine" project which has a budget of EUR 100 million and involves almost all European engine makers and other interested parties. It covers the propulsion systems of aircraft and has very ambitious targets to improve their efficiency but also environmental protection, with a reduction of CO_2 and NOx emissions which is in line with current policy guidelines. Projects of a comparable size were also launched in the field of aviation safety and new design concepts for aircraft.

"Tango" is a technological platform which aims to improve pre-series production of the key primary structures of an aircraft in order to introduce this technique on a commercial scale. The pre-series production of primary structures will allow a significant reduction in development time. The first phase of the project covers the definition of the structural performance, design and detailed evaluation of the technologies concerned. In a second phase, the best specific technologies will be selected for use in the construction of the primary structures. The results of these two phases of the project will be of benefit to the members of Airbus as regards verification, assembly and the necessary tests on primary structures.

Activities in 2000

The activities in the year 2000 will be largely devoted to the management of the second call for proposals. Although on the matter of critical technologies the research topics remain the same, as regards technological platforms the priorities relate to a reduction in external aircraft noise, a new configuration of convertible aircraft allowing horizontal and vertical flight, an aircraft with optimised power distribution and integrated modular avionics.

Given the growing economic stakes in the sector, the scope and effectiveness of research activities at European level must be stepped up. To this end, the expert advisory group on aeronautics has initiated a strategic study of European research in this area. The objective is to be able to respond effectively to the requirements of the sector during the next two decades.

RTD ACTIVITIES OF A GENERAL NATURE: MATERIALS AND STEEL

Activities in 1999

These RTD activities are aimed primarily at medium and long-term research which, for "materials", is of a mainly multisectoral nature. However, short and medium-term projects covering the objectives of the various key actions of the growth programme, are also funded. As materials properties and their performance in operation are linked to processes, materials research can be integrated with that on production and processing technologies.

Following the first call for proposals in 1999, the projects selected focus on: generic materials technologies, advanced functional materials, sustainable chemistry, expansion of the limits and duration of structural materials, production of cast iron and steel, casting, rolling, successive treatments and the use of steel.

Each project selected is highly innovative and has considerable scientific and technical merit, as well as potential for long term industry application in relation to products with better operational performance and less impact on the environment. These generic RTD activities therefore help to reinforce the scientific and technological bases of the Member States and associated states and could help them to become more competitive at international level.

Under the scientific and technological cooperation agreement with the United States, an implementation plan was signed with the *National Science Foundation* concerning cooperation on material sciences.

Examples of projects launched in 1999

The nanotechnologies will play a decisive role in the future with enormous impact on materials and products in the next century. With the "Carben" project, six firms, universities and research centres in two Member States and one associated country are seeking to develop a nano-structured material based on carbon the potential applications of which are considerable: dielectrics in super-condensers (for trains and future electric vehicles), systems for storing electrical energy and information displays which could, for example, replace TV cathode tubes.

"New technologies for the reconstruction of connective tissues: tissue engineering based on biocompatible polymers and adipose precursor cells": the shortcomings of the connective tissues pose serious problems for plastic and reconstructive surgery and appropriate solutions have still to be found. In the project, six partners from four Member States are seeking to combine new technologies and polymer prostheses and recent techniques for tissue culture in order to develop an artificial adipose tissue which is living and viable. This tissue could be transplanted to treat more effectively major problems of the connective tissues.

Activities in 2000

A call for proposals is planned for 2000 with research priorities identical to those of the previous one. Under the implementation plan with the *National Science Foundation*, the latter could finance the participation of American bodies in the projects; the possibility of launching a joint call for proposals with the NSF in 2001 will be examined and if necessary the scientific and technical priorities will be determined jointly.

Moreover, the expert advisory group attached to this activity will undertake a wide-ranging study of the research, innovation and training actions needed in the longer term in the field of materials RTD. To this end, specialised workshops will be organised with the involvement of experts.

GENERIC RTD ACTIVITIES: MEASUREMENTS AND TESTING

Activities in 1999

In the field of measurements and testing, the focusing of RTD activities on a limited number of well-defined objectives has made it possible to attract and select projects clearly targeted on finding solutions to particular problems. This makes it possible to estimate the contribution this activity is likely to make to Community research objectives in terms of expected benefits:

– *Benefits for European industry:* new instruments for better monitoring of processes and of product quality; reduction in the cost of tests; new, high-performance tools to combat fraud.

– *Benefits for trade:* progress in the functioning of the single market and free global trade; further support for the standardisation of test methods.

– *Benefits for citizens:* improvement in the monitoring of the safety and quality of products; strengthening of methods and techniques to support the fight against fraud and crime.

– *Benefits for public authorities*: novel technical developments allowing more effective checking of compliance with laws and regulations.

Examples of projects launched in 1999

The Community initiatives to combat fraud are being stepped up and strengthened. Sophisticated technologies and advanced methodologies need to be developed to combat fraud in areas as diverse as the unlawful sale of medicinal products and raw materials, fraud in high-tech products, jewellery, antiques, etc. To this end, a project will be developing a method of production, by laser, of holograms containing encoded information on various objects which will be directly recorded in a database. The technique and instrumentation should permit immediate authentication of the object anywhere in the world.

At the moment, the evaluation of processes and components used by foundries is based on the X-ray method which is applied to thin layers. This current method is very slow and provides purely qualitative information and the proper interpretation of the results depends to a very large extent on the experience and judgment of the operator. The solution proposed by the RASQUAL project to improve the speed of the non-destructive testing of components will be based on a digital radiography system capable of automatically detecting defects. The application of the results will considerably improve quality control in industrial production.

Activities in 2000

The implementation of these generic RTD activities will be continuing in 2000 with the publication of a periodic call for proposals and two targeted calls, the regular evaluation of the proposals and expressions of interest received, and the signature of contracts for the projects selected. The scientific management activity will be fully devoted to launching the first RTD projects under the 5th Framework Programme and analysing the results of a number of projects under the 4th Framework Programme which are being concluded.

The high level experts group will consider the direction of the work programme and the successive calls for proposals and, more especially, some of the key topics in the field, in particular from a prospective viewpoint.

SUPPORT FOR RESEARCH INFRASTRUCTURES

This activity is one of the novel features of the Framework Programme. The first results are encouraging. While the number of projects is still limited during this initial phase, the scope

of the topics tackled will make a substantial contribution to achieving the objectives of the activity. These objectives include in particular:

– the optimum use of geographically dispersed RTD infrastructures;

– the rapid transfer and application of RTD results to businesses;

– the improvement of interoperability and cohesion between Member States.

It is interesting to note that seven of the projects adopted concern the creation of virtual institutes.

* * *

Examples of the results of the 4th Framework Programme

The experts in large companies ("noses" or "tasters") who test products and raw materials often find it difficult to describe their quality criteria to suppliers and customers. Having identified the need, a business started up in France has sought technical solutions and opted for the development of electronic system. An electronic "nose" has therefore been designed for each product and has increased the guarantee of absolute quality in the food industry; It has paid off: the start-up employs 40 people and has a turnover of €3 million, 90% in exports.

The ISOTOPE project has carried out a comprehensive analysis of the various regulatory frameworks for urban public transport in Europe. The project has identified several appropriate contractual frameworks to obtain the best possible compromise between the objectives of productive efficiency and of social and network integration. This work will contribute to the review of the regulatory framework for public service obligations in the field of passenger transport (Regulation 1191/69).

Sixteen industrials, university and research partners have tackled the problem of reducing noise in aircraft cabins. The mathematical models which they have developed allow total management of noise reduction from the aircraft design stage, enabling a considerable improvement to be made to comfort in the cabin. Furthermore, these models allow for substantial time savings in the development and the production of new aircraft models.

Food products containing GMOs will soon be on the market. Community legislation requires that the presence of GMOs be indicated on the labelling. This calls for effective methods of identification. A Community project has recently developed six methods for the identification of GMOs in food which have been put forward as European standards.

Energy, environment and sustainable development

Sub-programme: Environment and sustainable development

Key indicators	Proposals received in 1999		Proposals adopted for funding in 1999		Contracts signed on the 1999 budget (up to 31.03.2000)	
	Number	Contribution requested (million €)	Number	Contribution proposed (million €)	Number	Contribution granted (million €)
Shared-cost actions	883	1 565.58	154	201.03	103	123.77
Grants						
Support to networks	23	20.52	4	5.40		
Concerted actions	23	13.24	4	1.65		
Accompanying measures	22	5.58	3	0.15		
TOTAL	**951**	**1 604.92**	**165**	**208.23**	**103**	**123.77**

Activities in 1999

1999 was marked by the effective launching under the 5th Framework Programme of the sub-programme "Environment and sustainable development", with a first call for proposals on the programme activities followed by the negotiation and drawing up of research contracts for the projects selected. The scientific fields open in the call for proposals have in general been well covered, even if some activities still have to be strengthened. The budget objectives have also been 100% met.

The projects selected are already likely to provide specific factors which will help to make progress on the various components of sustainable development, one of the driving forces behind the sub-programme: these include, chiefly, the scientific component which is at the heart of the key actions, but also the economic and social components, these two areas having been well marked out both in the key actions and in the generic RTD activities.

Furthermore, these projects are firmly in line with the approach taken under the 5th Framework Programme, the aim of which is to help resolve major social problems. Most of the projects cover several disciplines (scientific, socio-economic, etc.), fulfil the demands of European Union policies, and bring together various types of economic and social stakeholders concerned by the problems tackled.

In parallel with the selection and launching of contracts, the environment sub-programme has pursued an intensive policy of communication with the bodies accompanying the programme, maintaining close links with the programme committee during both the procedure for the launching of the calls for proposals and during the selection of the proposals. In addition, the results of the exploitation of the projects concluded under the 4th Framework Programme have been systematically presented to the committee. The three advisory groups of experts advising the Commission on the activities of the key actions have also been systematically associated with defining the activities.

The setting-up of the "Director's Group", which for each programme brings together all of the Commission departments concerned with the research topics involved, is a major innovation in the 5th Framework Programme. The environment sub-programme has made use of it to examine more closely with the Directorate-General for the Environment the scope for using the research results to strengthen policies. Working links have now been established for this purpose with the various sectors of activity of that Directorate-General.

Finally, 1999 will have been "the year" of evaluation and external monitoring: the five-year evaluation and annual monitoring were carried out in parallel, involving a large number of discussions and analyses of the work performed.

Implementation of the recommendations of the 1998 external monitoring panel

The recommendations of the 1998 monitoring panel placed the emphasis above all on the exploitation of the results of the 4th Framework Programme and the development of indicators for that purpose. They also recommended the development of a computerised management system. These recommendations have all been implemented. A strategic information system has been developed for the exploitation of the results of the 4th Framework Programme which brings together all of the projects and extracts the results. These are presented at regular intervals to the Programme Committee following its very positive response to the first experiments on the subject. In addition, a management system which makes it possible to keep track more closely of the figures for and type of proposals and contracts as well as the contracts' lifecycle has been developed and used.

Main recommendations of the 1999 external monitoring panel

The external monitoring panel on activity in 1999 expressed the view that the changeover from the 4th to the 5th Framework Programme went well on the whole thanks to the high level of mobilisation on the part of the Commission. Its recommendations mainly concern the precautions to be taken to make better use of and safeguard the results of the projects under the 4th Framework Programme which are still in progress, the procedures followed and the periods of time between evaluation and the negotiation of contracts (though the panel recognised that major progress has been made in this respect), the type and calibre of the communication with the Programme Committee and the advisory expert groups. Matters relating to the management and dissemination system were also tackled. Furthermore, the panel notes that the shortcomings in the monitoring of the contracts and the performance of certain administrative tasks are due to staffing problems.

Activities in 2000

The review of the work programme with the external advisory groups, the Programme Committee and the group of directors started at the beginning of 2000. It should be finished in September 2000 and incorporated into the third call for proposals which is planned for November 2000. Other activities planned in 2000 concern in particular the evaluation of proposals submitted following the second call for proposals and the preparation of contracts. In parallel with this activity, the coordination of the contracts for 1999 will mobilise substantial resources to ensure a good start to the research in the 5th Framework Programme. The "SME" and "Marie Curie fellowship" activities, which are covered by calls for proposals that are permanently open, will in principle give rise to three selections.

The programme activity will also cover the implementation of the communication on "a European Research Area". A substantial contribution to the Commission communications on sustainable development and climate change is also planned. Particular efforts will also be paid to the question of coordination of research with the Member States and this will be the subject of informal work and exchanges with the national agencies responsible. A few major conferences are also planned, including the Conference on Marine Science in Hamburg and the Conference on the Cultural Heritage in Strasbourg.

The activity in 1999 and 2000 on each of the four key actions, the generic RTD activities and support for research infrastructures corresponds closely to the framework described for the sub-programme as a while and is therefore not described in detail for individual projects. These activities are also broadly integrated. For example, projects on the interaction between

land and the ocean covered by the two key actions "Water management" and "Martine ecosystems" have been combined to create a major initiative bringing together research on marine issues and research on aquifer basins. This initiative, under the name of "ELOISE", is highly multidisciplinary and covers not only the physical, chemical and biological aspects of these zones, but also the socio-economic aspects of coastal areas. It will also make it possible to generate new tools for improved integrated management of coastal areas.

KEY ACTION 1: SUSTAINABLE MANAGEMENT AND WATER QUALITY

Examples of projects launched in 1999

There are currently no reference values for evaluating the natural basic quality of subsurface water. Such reference values are however essential for defining pollution. European quality standards for drinking water are sometimes exceeded by the "natural" quality of subsurface water due to geochemical processes. Under the BASELINE project, the inorganic and organic geochemistry of reference aquifer layers will be studied and the historical trends of these layers will be evaluated in terms of water quality. Modern chemical, isotopic and radiometric tracing methods and geochemical modelling will be used to define the changes over time in natural geochemical processes. The results will be used as a scientific basis to support the Framework Directive on water and to issue recommendations for monitoring natural aquifer layer systems. This objective will be attained by working closely together with an advisory group drawn from the regulatory bodies taking part in the consortium.

The EU Framework Directive on water defines a framework for evaluating the ecological quality of watercourses. However, the precise method for determining their ecological status still has to be defined. For this, it is necessary to establish a general method of evaluation for streams and rivers and to define general quality objectives for running waters throughout Europe. The evaluation system will have to take account of various impact factors which will allow a holistic evaluation of streams. Under the AQEM project, it is proposed to establish the scientific basis of such a method, to develop it and to start transferring it to the applied management of water.

KEY ACTION 2: SUSTAINABLE MANAGEMENT OF MARINE ECOSYSTEMS

Examples of projects launched in 1999

The main objective of the COSTA project is to evaluate the stability of the underwater slopes along the European continental shelf, taking account of natural processes and human activity. The understanding of these phenomena can be increased by examining: (i) underwater sedimentary movements from prehistoric times to now; (ii) sectors inclined to being unstable; (iii) potentially unstable areas in deep-sea areas of exploration of interest to the oil industry. The frequency and scale of the movements need to be quantified as they affect the ecosystems, off-shore structures, coastal areas and the continental shelf and slope (e.g. tsunamis). The potential factors which trigger disastrous slides, such as gas hydrates, the maps of particular slides and the sedimentary dynamics will be studied both on glacial shelves (North Atlantic) and on shelves dominated by fluvial deposits (Western Mediterranean). This project will make it possible to lay the foundations for a systematic improvement in our ability to predict the risks inherent to the continental slopes.

The MATBIOPOL project is a complete study of the interactions between, on the one hand, geochemical and physical variables and, on the other, the microbial processes and biodiversity present in the microbial systems which develop in layers on the surface of deposits in coastal areas. The project sets out to study how such interactions can be used to combat the pollution of these deposits by hydrocarbons. The information obtained will improve our knowledge about microbial ecosystems in

layers, help to predict how they will react to hydrocarbon pollution, and make it possible to evaluate the potential of microbial layers in rehabilitating coastal areas polluted by oil.

KEY ACTION 3: GLOBAL CHANGE, CLIMATE AND BIODIVERSITY

Examples of projects launched in 1999

The CARBOEUROPE "cluster" should provide a better understanding and ability to predict and quantify several scenarios as regards carbon emissions in Europe, at both local and macroscopic level. This knowledge is crucial for the negotiations on the Kyoto Protocol on Climate Change. Another Community project, the GECS model which describes the change in global emissions (as represented by 28 regions or countries) of greenhouse gases for a number of different socio-economic development scenarios up to 2030, should also provide essential information.

There appears to be an increasing need to improve the forecasting of seasonal variations in climate. The DEMETER project will develop and experiment with a new, advanced system for seasonal forecasting of the climate over short periods (3 to 6 months). The project will be carried out with interaction with three user sectors which could draw substantial benefits from seasonal forecasting: health, agriculture and insurance. With the assistance of these users, the project will produce a quantitative evaluation of the economic value of the forecasting system and its possible impacts on European Union policies. The project is based on the PROVOST project under the 4th Framework Programme.

KEY ACTION 4: CITY OF TOMORROW AND CULTURAL HERITAGE

Examples of projects launched in 1999

The SUREURO project will provide building companies and local authorities with tools for better design, development, testing and use of modern techniques for converting existing dwellings at competitive prices compared with other, more traditional methods. This combination of technical, economic, environmental and even social aspects in a project which applies to the existing urban housing market in cities is an example of the contribution made by the environment and sustainable development subprogramme.

The aim of COALITION, the first concerted action in the field of the biodeterioration of the cultural heritage, is to develop molecular microbiology bases as an innovative conservation strategy. Micro-organisms are responsible for the destruction (decomposition) of all kinds of cultural heritage materials (stone, brick, glass, timber, etc.). The conventional method of analysing the deterioration of samples has very limited application because of ethical considerations concerning the conservation of the object. This limitation may be overcome by using microanlytical techniques from molecular biology, which minimise the sampling and optimise the diagnostic studies on the microbial contamination. In addition, this approach will permit the development of effective means of treatment to eliminate biodeterioration and to carry out experiments on the effectiveness of the present biocide and cleaning methods. Until now, RTD initiatives in this field have covered only part of the biodeterioration affecting the cultural heritage. This concerted action, which is being carried out by the main institutes and research programmes in the EU, includes 21 international and national research projects. It uses a multidisciplinary approach to bring together all aspects concerning the conservation of the cultural heritage. The new technique proposed should also make it possible to reduce the health risks to restorers

and improve the instruments and resources needed for restoration work.

GENERIC RTD ACTIVITIES

Examples of projects launched in 1999

The DEEP project is aimed at the development of effective product information systems to improve users' behaviour with regard to sustainable development. The research will examine the information systems for "ecological" products, which could become efficient tools for promoting sustainable consumption models. They should in particular stimulate the emergence of "green" markets, the design and development of new "green" products and services, and increase consumers' awareness about the environment.

The SEISLINES project will develop a methodology for evaluating the structural reliability of underground water mains subjected to earthquakes. The proposed benefits are (1) a cost-benefit evaluation of seismic performance and of renewing underground water mains; (2) interactive systems to support decision-making to improve the most critical water mains so as to ensure continuity of service following an earthquake.

SUPPORT FOR RESEARCH INFRASTRUCTURES

Example of project launched in 1999

The aim of the CORINTH project is to improve the seismic risk research infrastructure at European level. The project is based on the development of an on-site laboratory. It will contain equipment for deep drilling at the intersection of active faults and make it possible to obtain data about the physical aspects of earthquakes and fault mechanisms and about the propagation of seismic waves. New laboratory equipment will also be developed to study how faults repair themselves and thus to increase our understanding of the "seismic cycle". .

* * *

Examples of results of the 4th Framework Programme

The AUTOFLUX project is developing and testing (in the laboratory and the field) an autonomous atmospheric measuring system, "AutoFlux", to measure surface stress, sensible and latent heat flows and also carbon dioxide flows. The system is primarily intended for automatic use on Voluntary Observation Ships (VOS) and on unmanned buoys, but may be used at other measuring sites in the near surface atmosphere. The system concept is that the fluxes are derived from the turbulence spectra using the "inertial dissipation" method. This technique minimises the effects of flow distortion and platform motion.

The objectives of the concerted action BEQUEST are to lay the foundations for a common European understanding of sustainable urban development through a multi-disciplinary network of representatives of all involved in the provision, use and maintenance of the built environment. An integrated approach to built environment quality assessment will be developed which will help to reduce the environmental uncertainty facing decision makers in the development and infrastructure industries.

Sub-programme: Energy

Key indicators	Proposals received in 1999		Proposals selected for funding in 1999		Contracts signed on the 1999 budget (up to 31.03.2000)	
	Number	Contribution requested (million €)	Number	Contribution proposed (million €)	Number	Contribution granted (million €)
Shared cost actions	814	1 743.25	221	284.17	51	50.05
Grants						
Support to networks	14	11.07	6	3.63		
Concerted actions	5	3.44	2	0.73		
Accompanying measures	227	93.80	79	12.20		
TOTAL	**1 060**	**1 851.56**	**308**	**300.73**	**51**	**50.05**

A year after the introduction of the new Framework Programme, many of its initial objectives have been or are about to be reached. Two calls for proposals have been launched according to the published roadmaps for 1999 and 2000. Following the evaluation results of the second call, a third call was prepared during 1999 to be launched in March 2000, to reach the objectives on renewables and to conform to the declared political priorities and the budgetary comments.

Activities in 1999

During 1999 the activities were mainly focused on: transition from FP4 to FP5, finalisation of the calls for proposals and a limited revision of the work programme, issue of the first calls, evaluation and selection of projects, preparation of new contracts, management of on-going contracts, annual monitoring exercise and 5 years assessment, and last but not least, qualitative analysis of the selected proposals.

The first call for proposals was characterised by a relatively good coverage, although for a number of thematic areas several aspects could be improved. Further, the call was over-subscribed by a factor of 3.5 and projects for almost twice the available budget were considered as being "worth funding" thus leading to a large number of proposals not being approved for funding. The 1999 budgetary comments of the European Parliament were well fulfilled by the results of this call, since the budget allocated to renewables reached 70% in the proposals selected for funding (after negotiation) and 71% for demonstration projects. The SMEs 10% objective was also fulfilled reaching 15% of total Community funding.

The second call for proposals featured also a relatively good thematic coverage, although for a number of thematic areas little interest was shown. The call was under-subscribed by a factor of 2 resulting in about €100 million of budget not spent. This has led to the decision to issue the third call, which was prepared by the end of last year and was issued in the beginning of 2000.

The programme was managed with the assistance of the Programme Committee and with the assistance of the Experts Advisory Group (EAG). The latter was in close contact with the EAGs on Nuclear Fission and on Environment given the multidisciplinary character of these activities. On every occasion the Committee issued positive opinion and the EAGs contributed to the preparation of the calls, as well as to the work programme revision.

The Group of Directors responsible for the sub-programme and the related EU policies gave orientations for initiated activities and contributed in a co-ordinated way. Its clearance

approach avoided most of potentially harmful delays in the procedures for decisions on selected proposals.

Implementation of the recommendations of the 1998 Monitoring Panel

The number of objectives has been reduced due to the FP5 "problem solving" approach based on key actions.

European Added Value is one of the main project selection criteria and relevance to the European energy policy including, where applicable, the White Book on Renewables, is taken into consideration.

The new structure and management of the sub-programme allows for closer co-ordination between research and demonstration. Implementation is still separate, due to different priorities and needs of R&D and demonstration clients, but efforts are made to harmonise project management and related issues.

Steps have been taken to reduce the workload of scientific officers by increasing their number in DG Research, but this will need further assessment. "Cluster co-ordinators" in DG Research and external experts in DG Energy & Transport are also helping to reduce the workload.

The effort for guaranteeing quality procedures is reflected notably in the new evaluation procedure. Regular update and improvement of the existing Quality Management Manual will be undertaken to include new issues not covered so far.

Lastly, progress is being made towards a consistent policy for publication and dissemination of results.

Main recommendations of the 1999 Monitoring Panel

The main recommendations of the Panel focus on the following issues:

- Management structure, not adapted to the unified structure of the programme;
- Procedures, including delegation of signature rights;
- Impact of projects, to be assessed and capitalised through appropriate quality control systems and knowledge management;
- Need for a user-friendly, comprehensive information management system;
- Usefulness of a detailed pre-screening of proposals, going further than the current pre-proposal check;
- Better interface with users of the programme, with simpler and more user-friendly information package and development of appropriate Internet tools.
- Evaluation process, which could still be improved for example by clearer definition of the European Added Value.
- Demonstration projects, that should not consist in a mere up-scaling exercise.

Activities in 2000

In 2000 the main priorities of the sub-programme are on the main revision of the work programme, the targeting of the next calls, and the exploration of the possibilities for the energy sector under the Commission’s Communication on the European Research Area.

Adaptations are being considered taking into consideration the results of the qualitative analysis of the selected proposals. One of its conclusions is that larger projects can better advance technologies in a number of areas. A more pro-active approach in identifying such

projects could be envisaged. In strategically most important areas the impact of the programme could be increased through the creation of clusters incorporating EU and nationally funded projects and by the creation of joint action plans which will identify the main priority areas for action. The definition of key-actions seems rather successful, even though it is still early to appreciate the actual reach of the main objectives.

A re-orientation of the work programme has been initiated in order to ensure the most positive contribution of FP5 to the fulfilment of the Kyoto protocol objectives to be met by 2010. The revision of the work programme will also allow to better define and quantify the scientific objectives taking into account the political priorities, the advancement of the science pertinent to the field, the forthcoming energy market liberalisation and the needs for new products and services.

The activities of the key actions of the sub-programme are largely integrated and therefore not detailed individually. Apart from the proper management of the needs and means for the effective implementation sub-programme, which takes place in consultation with interested parties inside and outside the Commission, their activities include:

– follow-up of the execution and valorisation of FP4 projects;
– preparation of a strategy through continuous appraisal of socio-economic and industrial needs, political priorities and assessment of technology evolution;
– revision of the work programme and planning of forthcoming calls for proposals;
– definition of internal working procedures on the daily management of contracts;
– implementation of the communication policy (publications, press releases, etc.);
– relations with the Expert Advisory Group and Programme Committee;
– preparation of impact assessment and programme evaluation;
– presentation of the programme and the key action and its achievements in different forms;
– contacts within Commission services (policy DGs and related RTD programmes) and outside (EU institutions, International Energy Agency, Member States, industry and research associations and organisations).

More specifically, the main activities foreseen during 2000 are as follows:

– follow-up of ongoing projects (continuous);
– appraisal of socio-economic and industrial needs, political priorities and assessment of technology evolution (continuous);
– valorisation of results of completed projects (continuous);
– mid-term revision of the work programme (May – October 2000);
– evaluation of proposals received under the third call and subsequent contract negotiation and signature (June – December 2000);
– preparation and issue of the 4th call, by November 2000;

KEY-ACTION 5: CLEANER ENERGY SYSTEMS, INCLUDING RENEWABLE ENERGIES

Examples of projects adopted in 1999

"More efficient holistic integration of a molten carbon fuel cell system using biogas as a renewable energy source": Thanks to a new European project, biogas produced from biological discharges and waste will for the first time be pre-treated and tested in factories for molten carbonate fuel cells (MCFC) in Germany, Spain and Slovakia. This innovative approach which integrates MCFC and biogas plants could have major socio-economic consequences. It will help to improve the competitiveness of the European Union on the world markets where our competitors are leaders in fuel cell technologies but are less advanced in Europe in the exploitation of biogases. At the same time, it will help to promote employment in the fuel cell industry and in agriculture in the Union and the applicant countries. This potential impact on employment, in particular in rural areas thanks to the promotion of biogas, is important for regional policy.

"UFO project - Universal fibre optics - integration of fibre optics in buildings": The amount of energy required to light buildings can be reduced considerably if natural daylight and artificial lighting are used jointly in an optimum way. The UFO project will develop a prototype maximising the use of light in buildings and substituting artificial light with daylight as soon as possible through the use of fibre optics. This innovative technology will help to reduce energy consumption in buildings and hence CO_2 emissions. A previous study showed that the potential for energy saving through the more efficient use of light in buildings is very high: it was estimated at around 18 Mtep/year in 2010, or a reduction in final energy consumption in the non-residential sector of more than 12% or 26 million tonnes of CO_2 emissions.

KEY ACTION 6: ECONOMIC AND EFFICIENT ENERGY FOR A COMPETITIVE EUROPE

Example of project selected in 1999

"New hot air solar volumetric receiver for heliothermal power stations": Heliothermal power stations provide an excellent option to help reduce greenhouse gases. Their potential is estimated at 23GWe in 2025. With this technology, solar radiation is focused on a receiver placed at the top of a tower in the middle of a field of heliostats (large solar reflectors). The hot air thus produced is converted to produce electricity by means of traditional conversion processes. The first commercial power station in Europe using the technique of concentration on a central tower will be established near Seville in Spain. It will have a capacity of 10MWe of solar origin. This project aims to develop and demonstrate a new technology for hot air volumetric receivers based on ceramic absorbent modules. This technology will make it possible to improve the performance and viability of components while reducing manufacturing costs. In the initial stage, a 200kWth receiver will be designed and tested. Then, after validation of the results, a 3MWth receiver will be developed and tested. The overall reduction in the costs of producing electricity from solar energy as a result of this project could reach 10%.

RTD ACTIVITIES OF A GENERIC NATURE

The energy RTD projects of a generic nature are in line with the new priorities presented in the European Research Area and more specifically with its part regarding the "common system of scientific and technical reference for policy implementation". Many results of the energy-related socio-economic research (e.g. impacts of measures, prospective analysis,…) are directly used as a scientific background to the policy initiatives in energy and environment at both EU and Member States level.

Example of project selected in 1999

"Systems analysis for progress and innovation in the energy technologies" (SAPIENT): The aim of this project is to develop an integrated model capable of evaluating the role of the energy technologies in the European Union and the world. To do this it uses the main European and world energy models, mainly those which incorporate the endogenous development of energy technologies. SAPIENT will give quantitative information on the costs and benefits of various energy policies and strategies to combat climate change, including the role of RTD in conjunction with the Kyoto flexibility instruments.

Apart from the follow-up of the ongoing projects and evaluation of the proposals of the 3rd call and the corresponding contract negotiation, the following activities are foreseen:

- revision of the work programme to maximise the link with energy policy objectives and developments on the one hand, and with energy research policy objectives on the other, incorporating socio-economic research and environmental policy;
- quantification of sustainable development;
- stimulation and guidance of thematic networks in the E3 field (energy, environment, economy);
- co-ordination of national and European RTD energy policies in line with the European Research Area;
- publication of medium to long term World Energy Technologies outlook;
- extension of the external cost methodology to Central and Eastern European Countries and to the ecosystem damages evaluation;
- very long term energy-environment activities;
- experience curve methodology development to assess energy programmes and policies;
- launch a study on energy technologies and climate change, the results of which are expected in 2002

– .

* * *

Examples of results from the 4th Framework Programme

"Advanced cycle technologies": The project aimed at improving efficiency and decreasing cost of power generation based on coal, using the "IGCC" (integrated coal gasification combined cycle) technology. The IGCC plant of Puertollano (Spain) was taken as a conceptual base case and the project looked at various ways to achieve the efficiency improvements and cost reduction envisaged. It is a success story, because it has achieved its objectives through innovative design concepts that could be applied immediately if such a plant was build. The solutions envisaged include structural simplifications, which would have a positive impact on cost, the efficiency, but also the reliability and availability of the plant. The result would be a cleaner and more efficient use of coal, well in line with the emission directives, and also in line with the necessary CO2 abatements.

"Climate technology strategy within competitive markets: towards new and sustainable growth": Putting together different modellers, this project expects to really provide concrete recommendations at the European and world level in the medium and long-term on the Climate Change issue, taking into

consideration the role of energy technologies. It concluded e.g., that in a baseline scenario, CO2 emissions at the world level will increase from about 6 500 MtC today to 13 500 MtC in 2030 and that technico-economic improvements in renewables technologies could reduce CO2 emissions by about 5%

"The national implementation in the EU of the ExternE accounting framework": This project evaluates and quantifies the external (environmental) costs of energy fuel cycles for power generation. It implements the ExternE accounting framework in all Member States. This project is considered as one of the most advanced in the field word-wide. Among other examples of results, it has been discovered e.g., that coal electricity production has external costs approximately three times higher than gas electricity production.

"Renewable electricity in liberalising markets": The evaluation of the renewable electricity regulatory instruments suggests a new EU framework for renewables support including the concept of tradable obligations (green certificates) as a way of fulfilling good balance of needs among stakeholders, and maintaining coherence with liberalisation principles.

Confirming the international role of Community research

Key indicators	Proposals received in 1999		Proposals selected for funding in 1999		Contracts signed on the 1999 budget (up to 31.03.2000)	
	Number	Contribution requested (million €)	Number	Contribution proposed (million €)	Number	Contribution granted (million €)
Shared-cost action	498	433.44	25	22.58	19	17.04
Grants	101	5.37	13	1.34	11	1.13
Support to network	25	13.21				
Concerted actions	34	17.02	1	058	1	0.58
Accompanying measures	370	187.05	25	2.99	23	2.85
TOTAL	**1 028**	**656.09**	**64**	**27.49**	**54**	**21.61**

Under the 5th Framework Programme, international cooperation on RTD takes place in two ways:

– Through the participation of third countries in the Specific Programme "Confirming the international role of Community research" (INCO 2).

– Through the participation of those same third countries in activities relating to the other programmes (with varying arrangements depending on the countries or groups of countries).

Under INCO 2, in accordance with the Specific Programme, activities in 1999 varied according to the groups of target countries:

- The eleven countries in the pre-accession phase were able for the first time to participate as associated countries in calls for proposals under the Framework Programme. Thus, with a view to enlargement, an important step was taken with all countries in the pre-accession phase to integrate them more fully in the European research system and allow their active participation at all levels of the Framework Programme (projects, programme committees, national contact points, expert groups, etc.). The results obtained are encouraging whether one considers instances of participation in the projects or the total volume of activity in which participants from these countries will be involved. In order to help these countries in their integration efforts, accompanying measures have been offered for awareness-raising and training, attendance at scientific conferences and support for centres of excellence, mainly to enable them to strengthen their links with other European centres. The call relating to centres of excellence attracted 185 proposals, 30 of which were judged to be of the highest quality.

- The other countries of central and eastern Europe and the New Independent States of the former Soviet Union benefit from the COPERNICUS scheme which supports research projects in the field of the environment, industrial technologies and health. Over 200 proposals were received, 64 of which were selected for a Community contribution totalling €35 million. Moreover, INTAS (International Association for the promotion of cooperation with scientists from the New Independent States), funded mainly by the Community, funded 207 new projects following 1999 calls, for a total amount of €16.9 million. Moreover, the text of the scientific and technical cooperation agreement with Russia was finalised and submitted to the Council and Parliament. These countries and those in the pre-accession phase also benefited from accompanying measures (awareness and training, assistance with conferences).

- For the Mediterranean partner countries, two calls were launched in 1999. The first led to 42 successful proposals for a Community contribution of €14 million, relating to the

efficient use of water resources and preservation of the cultural heritage. The call also covered infectious diseases and the effectiveness of health systems and policies but no proposal was adopted in these areas. The second call gave rise to 66 proposals for a Community contribution of €7 million in favour of socio-economic modernisation, water and health policy (negotiations under way). Five accompanying measures were also funded. This individualisation of scientific and technological cooperation between the Union and the Mediterranean partner countries comes under the implementation of the Euro-Mediterranean partnership derived from the Barcelona process. By supporting the scientific modernisation and socio-economic development of the countries in question, the Framework Programme is also helping to prepare the conditions for the free trade area between the EU and this group of countries planned for 2010.

- As regards countries with emerging economies and industrialised countries, the 5th Framework Programme association agreements with Norway, Iceland, Liechtenstein, Israel and the 11 countries in the pre-accession phase entered in force in 1999, and the agreement with Switzerland was signed. An S&T cooperation agreement was also signed on 14 December with China and the agreement with the Argentine was concluded on 2 November 1999. The agreements with Canada and Australia assisting under the 4th Framework Programme were also extended to the 5th Framework Programme on 30 April and 9 December respectively. These S&T cooperation agreements attest to the desire to promote the competitiveness of European industry and its penetration on new foreign markets. The INCO 2 Programme seeks also to strengthen the position of European research on the world scientific and technological scene while helping to solve problems of a global nature. For example, in 1999 the programme participated in the second EU Japan seminar on seismic risks in Reykjavik. This event was an integral part of a cooperation programme launched in 1998 with the aim of making progress on research into earthquakes and possible solutions.

  In addition, special attention was paid to the development of inter-regional S&T cooperation. For example, a in the ASEM context a meeting of Science Ministers was held in Peking which made it possible to envisage action in such varied areas as forestry, water, sustainable urban development and cultural heritage. In addition, following the June 1999 Rio Summit of Heads of State and Government, inter-regional scientific cooperation is taking place between the EU and Latin America and the Caribbean countries

- The calls launched in 1999 in connection with research for the benefit of development covered the following themes: sustainable instruments for improving health (in particular vaccines against malaria, schistosomiasis and pneumococci), tools for sustainable crop and livestock production, sustainable development policies. A total of 42 proposals were adopted for funding of €36.5 million. This is in direct support of the Community's overall policy towards the countries concerned, with the objective of dealing jointly with the challenges of development (health, security of food supply, sustainable use of natural resources, etc.) in the long term mutual interest.

- Moreover, 21 COST actions began in 1999, bringing the number of actions underway to 193 while 380 enterprises and 144 research bodies took part in new EUREKA projects.

Examples of projects launched in 1999

Cooperation with the non-associated countries of central and eastern Europe and the New Independent States

The metalworking sector is one of the most important industrial branches in the New Independent States and at the same time one of the major polluters. The IRCYL project aims to study cyanide pollution from gold mines. The investigations are focused on the effects of a serious accident in a mine in Kirghistan in 1998, when Lake Issyk-Kul, one of the most precious natural resources in Kirghistan, was polluted by thousands of kilograms of cyanide. The importance of such a project is underlined by the similar accident which occurred in February 2000 in a gold mine in Romania. Negotiations are underway to extend the project to include that accident in the study. The results of the studies will be used for a management plan for environmental risks and disasters and to set up a forum for communication on the risks of the technique of leaching with cyanide.

Cooperation with the Mediterranean partner countries

The aim of the IRRISPLIT project is to study the effectiveness of partial crop irrigation. This project is based on an innovative method which consists of examining the effects of irrigation applied initially to one side of the root only, leaving the other side dry; then irrigating the other side in turn, leaving the first side dry. The research will measure the effects of such a system of irrigation on the vigour of the plant growth, production of fruit, use of water and use of fertilisers. The various methods of partial drying of the root will be evaluated in order to determine the optimum efficiency of various crops and define the parameters for more efficient use of water without reducing the yield.

Research for development

Tuberculosis is now the most widespread human infection. This makes the search for an effective vaccine a major public health priority at global level, all the more so as there are many cases of resistance to current treatments. Previous research funded under earlier Framework Programmes has already led to major advances. Following on from these, a broad research consortium entitled VACSEL, involving European and African research institutes, will carry out a study of the long-term immune correlates. It will be based on a new protocol and on the extensive clinical testing facilities in Lusaka. Thus, in a few years, large-scale tests of vaccines against tuberculosis could become a reality in one of the regions of the world where the disease is spreading the fastest.

Implementation of the recommendations of the 1998 external monitoring panel

Of the many actions undertaken in this area, mention may be made of the following:

- Completion of the INCOPOL study and the launch of various initiatives (for example in the framework of MoCo, Asem) to strengthen collaboration between INCO activities and those of the Member States. This action will be carried forward by the launch of two studies, one on conditions for receiving foreign researchers in Europe and the other on flows of researchers entering and leaving Europe;
- Continuation, through accompanying measures, of efforts to improve the preparation of the central and eastern European countries and the New Independent States for participation in the programme;
- Promotion of S&T cooperation agreements: information measures (e.g. conference in Stuttgart), encouragement of joint projects, evaluations of impact of agreements etc.;
- More support for the definition of a research policy in relations with developing countries;
- Efforts to achieve greater coordination between INCO and MEDA.

Main recommendations of the 1999 external monitoring panel

The monitoring panel recognised the successful launch of the programme as a whole, in particular the evaluation procedures which it analysed in greater detail. It made the following recommendations:

– make information documents more user friendly and make greater use of national contact points and delegations in third countries;

– improve internal monitoring and evaluation of the management of the programme, the life cycle of projects and the achievement of objectives;

– adopt a more dynamic approach to the communication of results.

As part of an on-going, constructive dialogue, the Programme Committee enabled the INCO programme to be launched with the attainment of 1999 objectives. As regards the Directors Group, it is a consultation forum which is very useful for the definition of the policy guidelines for the programme, e.g. for the definition of work programmes. In 1999, the review of the work programme made it possible to determine the priorities and scientific content of calls for proposals to be published in 2000 and 2001 in order to meet the expectations of the researchers concerned.

* * *

Examples of results of the 4th Framework Programme

Microbicide research: AIDS is killing more and more women throughout the world and more than three quarters of the cases are by heterosexual transmission. The development of an anti-HIV vaginal agent has therefore become a major priority. Recent clinical studies have shown the ineffectiveness of the main potential substance, the long standing spermicide Nonoxynol-9 (N-9), which moreover has significant side effects. An INCO project has therefore recently been started with the aim of investigating the use of new microbicides in phase I and beyond and, in phase II, testing a standardised preparation of Dextrane sulphate, which is cheap and harmless, in Uganda and the Ivory Coast. The objective is to give fresh impetus to the development of a new generation of microbicides capable of entering the distribution systems for medicinal products in a few years time. The microbicides should, moreover, have a positive impact on female genital infections, one of the most common and neglected health problems in many developing countries.

Care for refugees: A project with input from research institutions in Kenya, Uganda and a number of Member States aims to determine whether the usual refugee camps, their isolation from the host population and the development of health programmes specially targeted on residential camps could not be replaced by an alternative integrated approach using the health services of the host country which would receive substantial assistance to this end. An analysis recently published in *The Lancet* described the successful implementation of this alternative strategy in Guinea.

Pollution of the Black Sea resulting from mining activities: Evaluation, prevention and remedies: intensive mining in the coastal area of the Black Sea has resulted in the production of millions of tonnes of mine waste. As part of an INCO-Copernicus project, a team of three eastern European partners and two partners from the Union has carried out a study on the environmental impact of these mining activities. The project developed innovative, low-cost technologies, both preventive and curative, to minimise the impact of contamination, improve water quality in the Black Sea and ensure the survival of

local ecosystems.

Laser interferometer for high-grade industrial activities: An INCO-Copernicus project developed and patented a new principle for stabilisation of laser frequencies. The prototype was tested successfully in industrial conditions and three Polish, Bielorussian and Ukrainian SMEs which are partners in the project have begun commercial production of the new instrument. The new laser interferometer is much cheaper and more compact and robust than current systems on the market and it opens up the possibility of a range of applications, particularly in the engineering industries of the central and eastern European countries and the New Independent States which will facilitate the adoption of European quality standards.

Development of methods and instruments for the detection of oil slicks: Four partners from Germany, the Ukraine and Russia have developed an advanced radar system with considerable potential for the detection of oil slicks on the sea's surface. The system offers clear benefits and can be used for remote exploration of the earth and its atmosphere (including the monitoring of pollution and plant cover, or cartography and analysis of clouds and air flows).

Small Mediterranean reservoirs: hill lakes/reservoirs are dams created by means of banks of earth. An INCO-DC project selected some examples in Tunisia, Morocco and Syria to establish an observation and monitoring network. Automatic data-collection equipment makes it possible to acquire the main hydro-climatic parameters. Satellite teletransmission of the data enables the research teams to intervene rapidly. The project includes studies on agronomy, agricultural economy, social management of water and erosion as well as the sustainability of hill reservoirs and their integration into the sustainable development of isolated regions. The objective of replenishing the water table and supplying water to surface wells has been achieved in most cases.

Promotion of innovation and encouragement of SME participation

Key indicators	Proposals received in 1999		Proposals selected for funding in 1999		Contracts signed on the 1999 budget (up to 31.03.2000)	
	Number	Contribution requested (million €)	Number	Contribution proposed (million €)	Number	Contribution Granted (million €)
Shared cost actions	99	56.26	20	14.18	10	7.90
Grants						
Support to networks	35	8.96	4	0.78		
Concerted actions						
Accompanying measures	168	109.62	87	46.97	6	4.32
TOTAL	**302**	**174.84**	**111**	**61.93**	**16**	**12.22**

The "Innovation and SMEs" programme focuses on two closely connected issues:

– innovation as the principal means to enhance competitiveness and economic growth;

– access to research for SMEs which play an essential role in boosting economic competitiveness in Europe and make a crucial contribution to employment.

In the context of the 5th Framework Programme, this horizontal programme thus fulfils three main functions:

– as a service provider, offering information and assistance to innovating enterprises (in particular SMEs) and supporting the thematic programmes to promote innovation and participation of SMEs;

– as a clearing house, collecting and analysing data on innovation and information on European and national initiatives and policies;

– as a test bed, with pilot projects designed to try out new ideas in order to improve innovation and technology transfer at European level.

This programme has a total budget of €363 million. Its work programme comprises four main headings:

– promotion of innovation;

– encouraging SME participation;

– joint innovation/SME activities;

– coordination and support activities.

Implementation of the recommendations of the 1999 external monitoring panel

The recommendations of the 1998 monitoring panel have mainly been implemented through the following measures:

- The "Innovation and SME" programme established a framework for coordinating the activities of the innovation units provided for in the thematic programmes.
- The programme encompasses activities to ensure greater participation by SMEs and activities to promote innovation - and coordination between their respective networks - and has thereby created the conditions for enhancing dissemination and the transfer of technologies to SMEs. Moreover, the coordination of the Innovating Regions in Europe Network and the Innovation Relay Centres Network has been brought together in a single unit.
- The action lines for the promotion of innovation have been reduced from 14 to 7 in order to better focus the main priorities. Moreover, benchmarking has been introduced for the impact of each action line.
- Finally, the programme makes provision for activities involving cooperation with other Specific Programmes, in particular to support innovation. In combination with the Union's other policies, cooperation has been established in particular with the European Regional Development Fund to produce a European directory of regional public support measures for the promotion of innovation (RINNO project).

Main recommendations of the 1999 external monitoring panel

The monitoring panel formulated 8 recommendations to improve the effectiveness and acceptance of the programme:

- taking stock of experience gained in the various pilot actions and studies of the 4th Framework Programme;
- compiling statistics on patents resulting from Community research on the basis of information contained in the technological implementation plans submitted for each project;
- facilitating SME access to CORDIS, offering them translation services and raising awareness of its role as a help-desk for intellectual property rights;
- ensuring that economic intelligence projects are from the outset better geared to the features peculiar to certain industrial sectors;
- continuing to simplify procedures;
- giving instructions and clear objectives to the innovation units set up under the thematic programmes;
- improving cooperation among the various services aiding SMEs: single Commission entry point, national contact points, innovation relay centres , etc.;
- drawing up specific rules for the participation of SMEs in the Framework Programme in general.

The innovation part of the programme includes the following actions in particular:

Promotion of innovation and new approaches to technological transfer: The new system supports innovative research into non-technical and demonstration aspects to foster a culture of innovation and technological transfer. The demonstration component contributes to transnational dissemination and utilisation of the results obtained and also covers integration of new technologies and the taking into account of socio-economic and organisational results obtained in the projects.

Innovation Relay Centres: the Innovation Relay Centres Network constitutes an important infrastructure for transnational technology transfer and for assisting SMEs in the field of technological innovation. The 68 IRCs, which are technology advice centres, provide transnational cooperation services for SMEs based on detailed knowledge of the technological or economic profile of the companies and regions for which they are responsible. To this end, they cooperate with other complementary networks. The network started a new phase on 1 April 2000 which will last two years, harnessing the enormous human potential of some 1500 innovation professionals in 30 different European countries.

Various projects have been carried out to develop *regional innovation strategies*: 50 regional innovation strategy (RITTS/RIS) projects were in progress in 1999, as well as 11 transregional innovation projects (TRIPs), aimed at encouraging interregional collaboration. In addition, the "Innovating Regions in Europe Network" facilitated the exchange of experience between the regions concerned. This network supports RITTS/RIS operations by disseminating the results of projects within the network and the RITTS/RIS concept outside the network. Its website (http://www.innovating-regions.org/) is an important part of the network. A regional innovation poilicy measures (RINNO) database is being set up to encourage the exchange and application of best practices between European regions in terms of innovation and regional development policies.

The Intellectual Property Rights (IPR) Helpdesk provides information and assistance on the rules relating to the protection and dissemination of research results in the context of the Framework Programme. More generally, this service makes the innovating community in Europe aware of intellectual property rights and facilitates access to patent information. It has a telephone helpline and a website offering a wide range of information: tutorials, guides, briefing papers, links, etc. It is mainly intended for current and prospective participants in Community research programmes.

Access to the financing of innovation is supported by three schemes: Innovation and Technology Equity Capital (I-TEC) in collaboration with the European Investment Fund (EIF) and the European Investment Bank (EIB) to encourage "early-stage" investment in technologically innovative SMEs; FIT for the exchange and dissemination of good practice in developing durable links between finance, innovation and technology; and the LIFT pilot project which offers awareness-raising, information, training and financing assistance services for participants in Community research projects wishing to commercially exploit their results. "Exploitation" may take the form of setting up a new business or take place in an existing business. To date over 1500 researchers, technology entrepreneurs and European innovation and RTD stakeholders have benefited from LIFT.

Internet service (CORDIS) and other means of dissemination: The CORDIS Internet service has been adapted to cover the entire 5th Framework Programme, with a website and a quick reference guide for each Specific Programme. The importance of this information website in promoting participation in the Framework Programme is shown by the number of documents downloaded in 1999: more than 2 million. The services offered through CORDIS (and beyond) by the IPR Helpdesk and the LIFT project (Linking Innovation, Finance and Technology) have attained their objectives and have contributed to the high quality of the proposals. The number of SMEs that have made use of these services is particularly encouraging. The Internet service is supplemented by a series of periodical (*Innovation & Technology Transfer, VIPs and CORDIS focus*) and *ad hoc* publications (brochures, folders, etc).

The "SME" dimension of the programme mainly aims at facilitating SME participation in the Framework Programme. To this end, the following activities were pursued in 1999:

Establishment of a single entry point for SMEs wishing to take part in the Framework Programme:

- Development of a specific website (www.cordis.lu/sme) holding all the information and documents necessary for participation;
- Assistance by telephone (over 7000 requests for information in 1999) and e-mail. More than 350 requests for information concerning SMEs and the Framework Programme have been received each month and have all been followed up within 24 hours.
- Receipt of proposals (more than 1 000 in 1999) and verification of their eligibility. Coordinators of non-eligible proposals submitted more than three weeks before an evaluation date received notice of preliminary verification which gave them a chance to rectify their proposal and submit it anew.

Establishment of the network of national contact points, providing information and assistance to SMEs at local level for participation in the Framework Programme.

Coordination of specific measures for SMEs:

- Publication of a simplified Guide for Proposers enabling SMEs to submit bids concerning specific measures addressed to them, regardless of their field of research. This Guide and the concomitant forms are available in all official languages of the Union.
- Drawing-up of contractual procedures and documents necessary to take part in the Framework Programme: evaluation manual, model contracts for exploratory awards and cooperative research (CRAFT), etc.
- Publication of information brochures in various formats (single page and ten pages), of examples of projects and of information on the impact of the Framework Programme on SMEs, enabling SMEs to judge whether it would be worth their while to participate.
- Organisation of evaluation of proposals received. Two meetings were held, one in April and one in September 1999, dealing with 850 exploratory awards and 150 CRAFT projects. More than 2 500 SMEs were involved in these proposals, i.e. 20% more than for similar measures during the first year of the previous Framework Programme. The common evaluation method made it possible to re-allocate among the programmes nearly 15% of proposals which would have been considered ineligible if there had been no such flexibility. The SMEs selected – approximately 40% of proposers – were quickly informed of the outcome of the evaluation (between 6 and 13 weeks after submitting their proposal) so that they were able to get down to work right away.

Technological and economic intelligence actions: 56 of these were evaluated in 1999. The 22 actions selected include projects in various sectors: leather, biomass, electronic commerce, aerospace and nanotechnology. Other actions were designed to provide training for SMEs in less developed regions or in associated countries.

Examples of projects selected in 1999

Innovation projects

The growing concern about the impact of conventional fishing practices on the environment has kindled an interest in recycling techniques. In this context, a European innovation project (MISTRAL-MAR)

will adopt a multidisciplinary approach towards studying key issues in the development, construction, functioning and management of a fishery undertaking with large-scale recycling. This will take the form, in particular, of reciprocal technological transfer between the members of the pan-European SME and research institutes consortium.

Lubricants are widely used on land and at sea. The large quantities used contribute significantly to the wide-spread contamination of the soil and surface waters. The LLINCWA project is intended to prevent and reduce environmental pollution at the highest potential risk, i.e. surface waters. To this end, major changes will have to be introduced on the lubricants market. The objectives are as follows: increasing the number of users of bio-lubricants to attain the critical mass necessary for their acceptance on the market; stimulating the process of self-organisation and self-regulation on the lubricants market; enhancing market transparency; promoting methods designed to protect the environment. An advisory group will be set up in each country participating in the project to ensure cooperation in this field. Each group will consist of representatives of local authorities, lubricant suppliers, shipowners and water quality control agencies.

Economic and technological intelligence actions

National Contact Points for SMEs play a key role under the 5th Framework Programme. Covering all Member States and all associated states, they provide information and assistance to the SMEs of their own country to enable them to participate better in the Framework Programme. The TRANSTRACC project is designed to pool their experience so as to pinpoint best practice and to facilitate reciprocal training and transfer of innovative practices. Specifically, the project will contribute towards providing training for staff at the National Contact Points of countries that have recently become associated to the Framework Programme and will encourage all members of the network to use accredited ISO 9000 methods.

Wine production not only has an economic impact but also consequences for the environment, economic cohesion in various rural areas of the countries of the Mediterranean, and the health of Europe's citizens. The WIAM project brings together regional development agencies, wine producers' associations, research centres and SME National Contact Points from three countries of the Union and from Hungary and Israel. Together they will monitor economic and technological trends in the sector and promote the submission of projects designed to reduce the environmental impact of wine production, improve the quality of wine and maintain it throughout the distribution chain. The project will thus benefit wine-growing regions in particular, which are among the least wealthy of the Union.

* * *

Example of a result of the 4th Framework Programme

The financial losses due to the chemical and microbiological breakdown of natural cork stoppers are estimated at almost €500 million a year. Under the CRAFT 5144 project, three Spanish, Portuguese and German SMEs had their manufacturing process analysed by a German institute. This enabled them to develop a new manufacturing process using microwaves to sterilise the raw materials and reduce the chemical contaminants responsible for degradation. Recently patented, this technology will be integrated in SME production lines to meet customer demand in more than 10 European countries but also in Chile, Australia and the United States..

Improving human research potential and the socio-economic knowledge base

Key indicators	Proposals received in 1999		Proposals selected for funding in 1999		Contracts signed on the 1999 budget (up to 31.03.2000)	
	Number	Contribution requested (million €)	Number	Contribution proposed (million €)	Number	Contribution granted (million €)
Shared cost actions	377	467.69	167	138.10	154	125.27
Grants	2 316	399.16	761	122.78	461	59.23
Support to networks	523	633.50	199	234.42	63	60.21
Concerted actions						
Accompanying measures	313	23.84	225	12.20	219	11.03
TOTAL	**3 529**	**1 524.19**	**1 352**	**507.50**	**897**	**255.74**

Implementation of the various activities provided for in the Specific Programme began in 1999. In the course of the year the work programme was revised twice, with a specific update in October followed in December by an adaptation of the tasks and financial priorities for calls for proposals for 2000.

Implementation of the recommendations of the 1998 external monitoring panel

Major efforts were agreed to improve coordination of the activities under the programme. Under the 5th Framework Programme, training networks were reoriented towards young postgraduates while Marie Curie grants are now aimed at post-doctoral students.

Special attention was given to disseminating the results of research among potential users and to improving mutual understanding between researchers and the general public. These issues have become major objectives of the Human Potential programme. Equal chances for men and women is another aim of primary importance under the programme.

Verification of the implementation of the Marie Curie fellowship scheme was completed in 1999, thus covering all the fellowships awarded under the 4th Framework Programme, and their impact was evaluated. Moreover, membership of the Marie Curie fellowship association was encouraged.

The selection procedure of training networks was further refined to include evaluation on a multidisciplinary basis in parallel with the overall reform of evaluation under the 5th Framework Programme; Finally, the Euro conferences were reorganised, taking account of all of the panel's recommendations.

The panel's recommendations for socio-economic research were fully integrated in the 5th Framework Programme. In particular, all information to potential proposers is now disseminated through CORDIS; the names of evaluators are regularly passed on to the Programme Committee; joint proposals are treated together so as to make optimum use of synergies between the different projects; and the accompanying measures mainly concern the dissemination of results.

Main recommendations of the 1999 external monitoring panel

The panel recommended:

- greater clarity of evaluation procedures;
- further strengthening of coordination of activities;
- improving verification systems;
- more openness towards non-member countries.

With regard to key action on socio-economic research, the panel recommended that research projects should be clearer about the way they contribute new knowledge, which should be evaluated in the last stage of implementing each project. The panel regards utilisation and dissemination as priorities in implementing the programme, which may require additional resources. Lastly, the panel calls for closer integration of support activities in developing S&T policies (strategic analysis and indicators) in key action.

To increase the number of researchers and encourage their mobility and networking the support to researcher training and mobility activity supports the training of young researchers, their mobility and transnational cooperation among research teams. The means used to this end are grants and training networks which under the 5th Framework Programme forge even closer links between academic research and research by companies.

Marie Curie fellowships have been diversified into "industry host fellowships" to contribute to industrial competitiveness, "development host fellowships" for the less favoured regions of the Community, and "training sites" offering young postgraduates brief stays in another country at recognised international institutions. Three calls for proposals were issued for the different types of fellowships, in response to which 2300 applications were submitted, of which 2230 were eligible and were evaluated. Accordingly, 415 individual fellowships, 85 industry host fellowships, 53 development host fellowships and 203 stays at training sites were granted by the Commission for a total amount of €123 million. The main achievements in 1999 were the successful launch of new types of fellowships, the establishment of common implementing rules for all programmes and the compilation of methods for evaluating the impact of fellowships financed.

In response to the first call concerning research training networks, 454 proposals were received, of which 167 were accepted, involving a Community contribution of €220 million. More than 1300 different teams of researchers were involved in the projects financed, which will ensure 4000 researcher-years of research training for young researcher, and postgraduate and post-doctoral researchers.

Another activity under the programme is devoted to enhancing access to research infrastructures. This objective takes the form of aiding researchers in gaining transnational access to infrastructures and providing support to creating and improving infrastructure networks. A first call for proposals was launched in 1999 with a budget €115 million. Of the 228 proposals received, with 28 countries participating, 143 were earmarked for financing.

The promotion of scientific and technological excellence activity encourages the best researchers and teams of researchers to engage in research in Europe and to better publicise their results. This activity also seeks to improve awareness of science and research in society at large and foster mutual understanding between researchers and the general public.

The activity is implemented in particular through Euroconferences, practical courses and summer universities organised at European level. Over the past four years, financing has amounted to €32 million which made it possible to organise more than 1 000 Euroconferences, summer courses and Eurolabor courses in which hundreds of prominent European scientists participated. In response to the call for proposals issued in 1999, 213 projects concerning 360 events were selected. To improve the dissemination of results a conference database has been set up on the Internet. Moreover, new types of conferences such as EUROTRON conferences (virtual conferences on Internet) and conferences for young researchers have been organised.

Prizes have also been awarded for the best scientific research projects: the Descartes and Archimedes prizes which have been newly introduced under the 5th Framework Programme. The eleventh European Contest for Young Scientists was held in Thessaloniki (Greece) from 18 to 26 September, bringing together 85 young scientists from 30 European countries and observers from several continents. The twelfth Contest will be held in Amsterdam on 18 September 2000.

The European Science Week and various round tables have also been planned to inform the general public and raise awareness. Following a first call for proposals in June 1999, €4 million has been earmarked for financing the proposals evaluated. The next European Science Week is planned for 6 to 12 November 2000. A second call for proposals devoted to round tables and information services is planned for 2000.

An overall goal of the Framework Programme is to give women equal access to disciplines and scientific research, and a team of the "Human Potential" Programme is entirely dedicated to promoting this aspect. On 17 February 1999 the Commission adopted a Communication entitled *Women and Science: Mobilising Women to Enrich European Research.* It puts forward an action plan to promote research by, for and on women throughout all the activities of the 5th Framework Programme. In this spirit, the Commission is setting a 40% target for the participation of women in the Marie Curie fellowships, in the advisory groups and the evaluation and monitoring panels (see the main report).

The first annual report on the socio-economic dimension of the 5th Framework Programme was compiled in accordance with the work programme. It was drawn up in close collaboration with the Specific Programmes and shows how the socio-economic dimension was integrated in the activities of these Specific Programmes in the first year of implementation.

The training networks have continued their work started under the 4th Framework Programme: monitoring of 249 contracts under the previous programme has continued and led to more than 60 evaluations at the half-way point of contracts in progress. By the end of 1999 this activity will have made it possible to provide training for about 2 000 young researchers. The activity is being continued under the 5th Framework Programme and a call for proposals is planned for the middle of 2000.

Examples of projects selected in 1999

Marie Curie individual fellowships

In the context of exchanges between universities and industry, an experienced Israeli researcher has been granted an individual Marie Curie fellowship to do research at a prominent European aerospace centre. He will be studying the fundamental processes of the interaction of the environment in weak terrestrial orbits and organic and inorganic materials, in particular thermal control linings in satellites. The project will focus on ways of extending the life of satellites and improving their performance to enable longer satellite missions at optimum performance.

Marie Curie industry host fellowships

An SME selected to host a Marie Curie fellow will develop a process for rapid evaluation of damage after natural disasters, the production of Geographic Information Systems (GIS) maps and the transmission of information to on-the-spot rescue teams via Internet. The project will be carried out in cooperation with two universities and will be based on experience gained in earlier projects in Honduras, Colombia, Peru, Cambodia and the Philippines.

Marie Curie development host fellowships

A Spanish company has proposed a project on biodiversity conservation on the Iberian Peninsula. With additional skills which it is seeking through the Marie Curie scheme, it wishes to enrich bioecological studies in progress by using molecular genetics techniques. These techniques should make it possible to assess genetic variability in target populations to improve estimates of their chances of survival.

Marie Curie training sites

A training site in Greece will offer training through research at PhD level in the following fields: laser-mater and the manufacture of advanced materials where the accent will be on new materials and structures, non-linear optics, and environmental and biomedical applications. The young researchers will be working in an international environment of high quality and will benefit from state-of-the-art equipment for experiments. This project at the frontier of several disciplines and industries will give the training scheme considerable added value for the young researchers.

Research training networks

Information archives have become extremely complex with the advent of multimedia. As yet there are no search tools to efficiently utilise and analyse the data in these archives. The Moumir network will focus on this problem not only through the theoretical development of methods but also their practical application. Training young researchers in this network will bring the academic and industrial sectors together, and tangible results are expected in the relatively short term.

High-level scientific conferences

The Ten Years of Hercules Euroconference was held in Grenoble in April 2000. The aim of the conference was to teach young European researchers to optimise the use of major research tools (neutron source, synchrotron radiation) for studies in solid physics, molecular biology and matter sciences. The conference was organised at a European scientific research centre of major importance because of the proximity of the European Synchroton Radiation Facility (ESRF), the Laue Langevin Institute (ILL) and the Nuclear Science Institute (ISN), and benefited from the participation of Professor J. Walker, Nobel Prize 1997.

KEY ACTION : IMPROVING THE SOCIO-ECONOMIC KNOWLEDGE BASE

This key action is designed to define the bases for social, economic and cultural development which will generate employment and the establishment of the European knowledge society. Accordingly, it attaches particular importance to the social sciences, the principal domain for analysing structural trends in economic, demographic and social development.

A first call for proposals was published in 1999, covering 12 research tasks. The resulting proposals have been evaluated and selected. The emphasis was on education, life-long learning, policies of employment linked to technology, social security, changes in family structure, the concept of European citizenship, the impact of the new media, globalisation, and the fight against xenophobia and racism.

The continuation of the socio-economic projects of the 4th Framework Programme in 1999 involved the dissemination of results, in particular on the CORDIS Internet site. The European conference on socio-economic research held in April 1999 also contributed to this dissemination and to the drawing-up of a second call for proposals, finalised in December 1999. Moreover, studies were completed for setting up a database on local initiatives to fight social exclusion. The database contains detailed descriptions of some 750 initiatives in the fifteen Member States of the Union. It will be available on Internet in autumn 2000.

The programme committee actively supported the implementation of activities. A subcommittee was set up in the field of socio-economic research. The advisory group of experts connected with the key action provided guidance for the work involved in the key action.

Example of a project selected in 1999

The impact of macro-economic policies on science and technology is largely unknown or at best inadequately treated. A new European project starts from the assumption that technological development and macro-economic circumstances are strongly interconnected. This project is designed to enhance our understanding of the links between macro-economic (national and supranational) policies and "explicit" scientific and technological policies. It will in particular assess the compatibility or incompatibility of these policies in the applicant countries. The project will lead to recommendations which should be widely disseminated to the political authorities.

Joint Research Centre

In 1999, the JRC pursued several initiatives to develop its mission as a reference scientific and technical research centre devoted to supporting EU policies. These have in particular consisted of arranging for independent external monitoring of its expertise and scientific resources, adopting project-based management and total quality management, devising a new personnel policy accompanied by a recruitment plan and training programme, and setting up a project group with special responsibility for the management of JRC knowledge.

Mission statement

The JRC's mission is to provide customer-driven scientific and technical support for the design, implementation and monitoring of EU policies. As a European Commission department, it functions as a reference centre of science and technology for the Union. Close to the policy-making process, it serves the common interest of the Member States, while being independent of special private or national interests.

To complete its mission, the JRC has a unique combination of facilities and expertise which surpass national frontiers. In addition, its networks enable it to stimulate collaborative research and to broaden its knowledge base.

Adopted on 16 April 1999, the JRC work programme in 1999 devoted a budget of some €250 million to four main themes:

I.	Serving the citizen	€74.1 million
II.	Strengthening sustainable development	€80.98 million
III.	Supporting European competitiveness	€26.15 million
IV.	Euratom work programme	€71.8 million.

A large part of the programme is devoted to services directly linked to EU regulations, such as the activities of the European Chemicals Bureau (ECB), the European Integrated Pollution Prevention and Control Bureau (EIPPCB) and the European Reference Laboratory for Air Pollution (ERLAP). This "customer-supplier" relationship has been strengthened by the signature of agreement protocols with the Directorates-General for Enterprise, the Environment and Education and Culture.

1999 was also the inaugural year for "clusters" at the JRC, i.e. the clustering of projects around major scientific, technological and social themes. This operation is intended to promote an interdisciplinary approach by putting teams of researchers from the various JRC institutes in touch with each other, making the Centre more widely known and strengthening mutual links with customers. The clustered themes include e-commerce, emissions and their impact on human health and the environment, global change, food, the agricultural environment and reactor ageing.

The JRC has made efforts to devise a coherent networking strategy to improve its technical and scientific support for EU policies. Several agreements have been negotiated and signed with national research organisations, such as TNO (Dutch Organisation for Applied Scientific

Research), and the DERA (the UK Defence Evaluation and Research Agency). In 1999, negotiations started with European industrial networks such as EUCAR (automobile industry) and CONCAWE (oil industry) to work together on vehicle emissions. The JRC's approach gives priority to establishing closer ties with the representative industrial associations rather than with companies in order to preserve the independent nature of its support for European competitiveness.

Scientific audit

The aim of the audit carried out between June and October 1999 was to determine whether the JRC was sufficiently well-equipped, materially and intellectually, to discharge the tasks assigned to it under the 5th Framework Programme. The 30 outside experts who took part made up eight teams (one per Institute) and have come to the following conclusions:

- The JRC's new mission statement has been warmly welcomed and enjoys the support of management and staff. Networking with the laboratories in the Member States, an essential part of the JRC's mission, is strongly encouraged.
- The scientific basis underpinning the mission statement is vital and must remain solid. Special attention must be paid to the balance between services and research.
- Modest, but significant, participation in joint actions with industry is desired, as are efforts on technology transfer.
- The importance of clusters for collaboration between the institutes is stressed. Efforts should be made to strengthen their operation.
- The JRC's effort to promote nuclear technology is recognised and encouraged; however, its sustainability depends on the maintenance of the present level of funding.
- The JRC's recruitment strategy needs to be improved to promote scientific robustness and the long-term viability of the organisation.

At the beginning of 1999, each JRC institute drew up a plan on competitive activities for the 5th Framework Programme as a whole in order to be certain of taking part in those which represent genuine added value for the work programme. The plan covers in particular the shared-cost actions, work for third parties and activities on behalf of the client Directorates-General. The JRC has submitted more than 250 projects under the first call for proposals; a third of them, with an overall value of €11.6 million, have been selected.

The European Technology Transfer Initiative (ETTI) continued in 1999. Twenty JRC researchers have taken part in the first cycle of business management training which took place from January to June 1999. Three possible spin-offs are in preparation. A call has been launched to capital management companies interested in the creation, setting-up and administration of a start-up capital fund, and negotiations have taken place with the tenderer selected.

Examples of projects

The fight against BSE: An important step forward was made in the fight against BSE in 1999. Coordinated by the Health and Consumer Protection DG and in collaboration with expert

institutes in the Member States, the JRC prepared over 14 000 samples and evaluated the results of four candidate BSE diagnostic tests. The resulting statement from the Commission's Scientific Steering Committee speaks for itself: three of these tests can identify animals clinically affected with BSE. Other projects cover the heat-treatment procedures for BSE decontamination and the detection of animal meal in vegetarian food, the evaluation of newly developed post-mortem tests (e.g. the presence of prions in blood), the setting-up of a sample bank for negative BSE samples, the production of reference materials to calibrate BSE post-mortem tests and the evaluation of tests to detect and distinguish between bovine spongiform encephalopathy and scrapie in sheep.

Adoption of the IUCLID base worldwide: In 1999, the International Council of Chemical Associations (ICCA) adopted the international uniform chemical information database (IUCLID), the development and management of which are being handled by the European Chemicals Bureau. This is a major advance in terms of standardisation as the worldwide chemical industry will now be using this base to extract and disseminate chemical data and improve access to information on chemical substances.

Nuclear energy

Key indicators	Proposals received in 1999		Proposals selected for funding in 1999		Contracts signed on the 1999 budget (up to 31.03.2000)	
	Number	Contribution requested (€ million)	Number	Contribution proposed (€ million)	Number	Contribution granted (€ million)
Shared cost actions	314	360.84	113	93.22	25	24.04
Grants						
Support to networks	18	7.70	13	3.33		
Concerted actions	11	2.90	8	1.76		
Accompanying measures	7	2.43	5	0.22		
TOTAL	**350**	**373.83**	**139**	**98.53**	**25**	**24.04**

The Nuclear Energy R&T Specific Programme of the EURATOM FP5 comprises the following components:

– A key action on controlled thermonuclear fusion;

– A key action on nuclear fission;

– Generic research on radiological sciences;

– Support to research infrastructures.

The transition from FP4 to FP5 was handled well and the response to the new structure and management arrangements from the research community was generally favourable. A significant reduction was achieved in the time required to process contracts, which will need to be sustained in the future. One lesson already evident from the first two calls of FP5 is that the Commission should be in a position to be more proactive in seeking good proposals in line with programme objectives. There is evidence of improved collaboration between different DGs and the JRC.

All activities relating to nuclear fusion are described below in the section relating to the key action.

Three calls were launched in March, two for the key action on Nuclear Fission with deadlines in June and October, and a continuously open call for generic research, support to infrastructures, training activities and accompanying measures, with different cut-off dates for the evaluation.

Research in severe accident phenomenology has reached a point where a move from detailed basic research to problem solving and applications is now possible. Similarly, in decommissioning, the research area is now considered mature and future work can focus on making knowledge more widely available and in bringing interested parties together. Strategies in the partitioning and transmutation area have been developed to minimise radioactive waste and to demonstrate the different requirements for the available options.

In the radioactive waste management area, it has been shown that efficient planning and execution, including public dissemination, of a major cost shared project, can be achieved.

A major step in emergency planning has been the facilitation of the upkeep and development of effective emergency preparations in Member States and in Candidate Countries. The generic research in radiological sciences has significantly advanced the understanding of the induction of cancer in human cells exposed to radiation.

The programme was managed with the assistance of the Programme Committee and with the assistance of the Experts Advisory Group (EAG). The latter was in close contact with the EAGs on Non Nuclear Energy and on Environment given the multidisciplinary character of these activities. On every occasion the Committee issued positive opinion and the EAGs contributed to the preparation of the calls, as well as to the work programme revision.

The Group of Directors responsible for the programme and the related EU policies gave guidance for initiated activities and contributed in a co-ordinated way. Its clear approach avoided most potentially harmful delays in the procedures for decisions on selected proposals.

Implementation of the recommendations of the 1998 Monitoring Panel

Most of the recommendations made by the 1998 monitoring panel concerning the improvement of the management of the programme have been implemented, either as an effect of changed rules for the 5th Framework Programme or as specific steps introduced. Some of the recommendations, e.g. appointment of evaluators for the whole of FP5, could, however, not be implemented as they were against the rules for FP5.

Some of the recommendations concerning dissemination of results and post-job evaluations will be acted on during this year.

Recommendations on increased networking, increased participation of industry and utilities, and activities to maintain expertise in critical areas have been acted on in the work programme for FP5 and will be implemented further as part of the efforts that will be devoted to the European Research Area.

Main recommendations of the 1999 Monitoring Panel

An examination of the newly revamped evaluation process has led to recommendations on that process, notably on the selection and guidance of evaluators and panel rapporteurs and the simplification of information required from proposers. The Panel also suggested that a strategic review of the outcomes and achievements of FP4 should be prepared in good time for the next monitoring exercise, and that the case for European centres of excellence should be made well in advance of FP6 decision deadlines.

In 2000 the main priorities of the Specific Programme are on the main revision of the work programme, the targeting of the next calls, and the exploration of the possibilities for the energy sector under the Commission's Communication on the European Research Area.

KEY ACTION 1: CONTROLLED THERMONUCLEAR FUSION

Since its inception, the EU Fusion Programme has been progressing towards a clearly defined long-term objective: "the joint creation of prototype reactors which will lead to electric power plants that meet society's needs: operational safety, respect for the environment, economic viability". The Community's financial support takes the form of shared-cost actions and accompanying measures (studies of socio-economic aspects, dissemination of results, training, etc).

Activities in 1999

Since the signature of a Contract of Association by Greece in 1999, all of the EU Member States (and the Swiss Confederation) are taking part in fusion research on the basis of contracts of association with EURATOM. Out of the seven candidate countries, which are associated with the EURATOM Framework Programme, three (the Czech Republic, Hungary, Romania) signed a contract of association in 1999, while individual shared-cost actions of limited duration have been prepared for the other candidate countries. The management of fusion research on the basis of contracts of association makes it possible to ensure that the programmes of the various Member States are directed towards the long-term objective and are complementary and coordinated. The joint effort of the Association also enables projects to be undertaken which would be too big for each member acting on its own.

The Commission coordinates the research programme and grants funds on the opinion of the committee of representatives of each Member State, the EURATOM Consultative Committee (Fusion), or CCE-FU. EURATOM financial support of 25% is granted to Associations for operational expenditure. For investments approved by CCE-FE, preferential support of 45% may be granted.

In 1999, the European Fusion Development Agreement (EFDA) was established. The EFDA is a framework contract between EURATOM and its customary fusion research partners. It covers three activities: the fusion technology activities carried out by the Associations and by European industry, the collective use of JET facilities and the EU's contribution to international collaboration such as the international thermonuclear experimental reactor (ITER). The operation of JET facilities is ensured by means of a separate contract between the Commission and the UK Atomic Energy Authority.

The physics programmes of the Associations and the JET have been focused on the use of existing fusion devices in order to develop high-performance operational scenarios of benefit for a "Next Step", such as the ITER, and in order to establish new, more precise laws of scale providing greater confidence in predicting the performance of such a large machine. In addition, new experimental facilities aimed at providing data to improve the concepts underlying fusion machines have started to provide results. R&D on fusion technology has covered a broad range of activities, both for the Next Step (e.g. the construction of a superconducting coils model and a prototype remote handling system) and for the long term, such as the development of low-activation materials which will be necessary for a fusion reactor.

The 1998 external monitoring report has stressed the quality of the work provided, the compliance with the deadlines set and the saving of resources allocated to the coordination of the programme.

The funding and coordination of fusion R&D by the Community have resulted in an integrated Europen programme and have put Europe at the head of world research in this field. The Fusion key action also contributes to the horizontal programmes of the 5th Framework Programme. Industrial investment (in particular by SMEs) in the development and supply of components for fusion devices is set to become increasingly important. The level of mobility of researchers is also very high (about 500 person-months per annum) and about forty young researchers receive training grants. Increasing attention has been paid to the socio-economic aspects of fusion energy, with studies in progress on environmental and safety issues and acceptability to the general public. Exhibitions and multimedia presentations have been prepared to inform the public more fully about fusion.

Example of a project selected in 1999

The EURATOM – CIEMAT Association (Madrid, Spain) has recently brought into operation a new, large fusion machine known as TJ-II, a Heliac-type stellarator, an alternative to the Tokamak. Its major role is to explore how the basic concepts of fusion machines could be improved. This installation provided interesting results in 1999. An operating mode with improved confinement has been obtained and filamentary structures have been observed in the plasma. Improvement of the diagnostics measuring the plasma parameters and the increase in the additional heating power are underway and will help to make progress in this research.

Activities in 2000

The key action will continue with its three main lines of action: activities related to the Next Step, the aim of which is to develop the capacity to construct and operate an experimental reactor; structured activities in the field of physics focused on improving the basic concepts about fusion devices; and structured activities in the field of technology aimed at preparing the demonstration fusion reactor (DEMO) and then a prototype reactor.

KEY ACTION 2: NUCLEAR FISSION

Activities in 1999

The objectives of the key action are: to improve operational safety of the nuclear installations, the safety of the fuel cycle, the safety and efficiency of future systems and to improve our understanding of practical issues in Radiation Protection such as, risk assessment and management, off site emergency management and the restoration and long term management of contaminated environments, as well as others. The knowledge base in Radiation Protection is also supported via Generic Research in Radiological Sciences.

Most of the projects launched under FP4 have been completed during 1999, final reports are or are being published and cluster summary reports will be prepared. The results of the projects in radioactive waste management and disposal and decommissioning have been presented at a conference, EURADWASTE 99, in mid-November. Equally the results of the reactor safety projects were presented at FISA-99 in late November. In radiation protection a mid-term report is also published.

Support has been given to the development of political initiatives, to the setting of terms of reference and the evaluation of projects under TACIS and PHARE, as well as to the Environment and Transport European policies. International co-operation has been pursued through relations with international organisations (IAEA, OECD/NEA and ICRP) as well as through scientific management of some INCO projects.

Examples of projects selected in 1999

"Loss of reactor core during a serious accident" (COLOSS): this project is aimed at improving

understanding of the phenomena which would take place in a nuclear reactor following a serious accident (involving the simultaneous failure of several safety systems). It deals more especially with core degradation as a function of risks and factors such as combustion rates, MOX fuel and boron carbide control rods. Experiments will be conducted on different scales, using real fuel materials, and models will be developed and introduced into the codes for the calculation of serious accidents. The results will make it possible it improve measures for the management of serious accidents in large light water reactors of both West European and Eastern European design (Central and Eastern European countries being associated with the project).

"Steam generator failure scenarios": this project tackles a serious accident scenario involving failure of a steam generator tube following a serious accident with core meltdown. This scenario, which could lead to a short circuit and a release of radioactive gas into the environment, has been considered important on the basis of probabilistic safety assessments. In particular, the project studies the possibilities of retention (i.e. non-release) of fission products by deposit in the steam generator. The results are applicable for testing the various procedures for managing accidents in pressurised water reactors (both Western and Eastern).

Activities in 2000

Main activities implemented or anticipated during 2000:

- Evaluation of proposals received under the third call (continuously open) and subsequent contract negotiation and signature (January - December 2000).
- Mid term review of the work programme (March - July).
- Follow-up of ongoing projects (continuous).
- Preparation and issue of the 4th call for proposals, by mid October 2000 (closing date 22 January 2001).
- Valorisation of results of completed projects to be published in CORDIS and preparation of cluster synthesis reports (continuous)
- Continuous assessment of technology evolution and active collaboration with international organisations.
- Training activities (e.g. EUROCOURSES)

RTD ACTIVITIES OF A GENERIC NATURE

These activities cover the following areas of the radiological sciences:

- Radiation protection and health to gain a thorough understanding of radiation action leading to health effects and to improve the quantification of radiation risk at low doses;
- Environmental transfer of radioactive material with a view to developing good practice in managing the impact of radiation sources;
- Industrial and medical uses of radiation sources in view of improving the safety and efficacy application;
- Internal and external dosimetry aiming at improving the methods of exposure assessment.

Main operational activities as for the key action on nuclear fission.

Examples of projects selected in 1999

"Methods for the repair of DNA in health physics": detailed knowledge of the basic mechanisms by which ionising radiation causes cancer and genetic disorders is essential to make progress in health physics, in particular as regards the effects of low doses and low dose rates. This project uses new technologies to study more especially the various damage repair paths and their interactions in order to gain a better understanding of genetic changes and carcinogenesis in man.

"Late health effects in persons exposed to ionising radiation in the southern Urals": our knowledge about the effects of ionising radiation is based on two information sources: molecular biology and epidemiological studies. In the latter field, the data are derived chiefly from survivors of the atomic bomb and patients treated using ionising radiation. In both cases, they refer to the effects of exposure to a high dose for a short period of time. Since the 1950s, about 10 000 people have been exposed to ionising radiation in low doses but for long periods in the southern Urals due to the dumping of radioactive waste in the Techa river. This project (which includes a Russian partner) is studying the incidence of cancer in this population, which will for the first time make it possible to quantify the long-term effects of low-dose ionising radiation on human health.

SUPPORT FOR RESEARCH INFRASTRUCTURES

Support for research infrastructures covers the following main activities:

– Support for the access to large-scale facilities by shared usage and collaborative programmes.

– Networking and creation of databases are also included where needed.

Main operational activities as for the key action on Nuclear fission.

Example of project selected in 1999

"European Network for the Consolidation of the Integral System Experimental Databases for Reactor Thermal-Hydraulic Safety Analysis" (CERTA): The reactor safety experimental databases acquired in European integral system test facilities provide reference information for the understanding of governing physical phenomena and for the validation of related computational methodologies. This project uses advanced information technologies to ensure a distributed collection of experimental data together with supporting test facility design and instrumentation data. The underlining rationale is the fact that advancement on hardware and software technologies is making traditional data storage obsolete and retrieval impractical. Since there is a continuous need to access representative experimental data for benchmarking reactor safety code predictive capabilities, the nuclear community is thus asked to take prompt action to preserve the experimental heritage acquired in the past with a considerable investment of resources.

* * *

Examples of results from the 4th Framework Programme

A comprehensive overview of all results in the areas of reactor safety, radioactive waste management and disposal, innovative fuel cycle concepts and decommissioning, were discussed at the FISA'99 and EURADWASTE'99 international conferences, bringing together all major stakeholders (industry, safety authorities, decision-makers, research organisations, etc.).

The main outcome and recommendations for future activities were:

- The understanding of the phenomenology of severe accident progression has been furthered to the point where a change in emphasis to problem-solving and end-user application is justified in FP5.
- Research in decommissioning is considered mature.
- Radiation protection and generic research in radiation science has been instrumental in underpinning optimised radiation protection practices.
- Radioactive waste management issues remain important and are being addressed logically leading in a stepwise fashion towards practical demonstration.
- The dissemination of results to the technical community and collaboration with other directorates general have been improved.
- A strategic review of the technical achievements of FP4 is recommended

ANNEX 2

STATISTICAL AND FINANCIAL DATA

TABLE OF CONTENTS

TABLE 1A: FP5 OVERVIEW: ALL PROPOSALS RECEIVED IN 1999 - ALL PROPOSALS SELECTED FOR FUNDING IN 1999 (1)

	ALL PROPOSALS RECEIVED IN 1999					ALL PROPOSALS SELECTED FOR FUNDING IN 1999 (2) (3)				
	A	B	C=B/A	D	E=D/A	F	G	H=G/F	I	J=I/F
	Number of proposals	Number of participations	Average number of participations per proposal	Requested financial contribution (€ million)	Average requested financial contribution per proposal (€ million)	Number of proposals	Number of participations	Average number of participations per proposal	Total financial contribution proposed by the Commission (€ million)	Average financial contribution per proposal
Shared-cost actions	10 657	74 061	6,95	17 888,94	1,68	1 851	13 198	7,13	2 709,44	1,46
of which R&D projects	*8 676*	*64 786*	*7,47*	*15 510,70*	*1,79*	*1 332*	*10 902*	*8,18*	*2 268,25*	*1,70*
of which Demonstration projects	*271*	*1 528*	*5,64*	*770,05*	*2,84*	*86*	*530*	*6,16*	*128,19*	*1,49*
of which Combined projects	*558*	*4 637*	*8,31*	*1 276,80*	*2,29*	*103*	*1 002*	*9,73*	*206,96*	*2,01*
of which Support to infrastructures	*169*	*212*	*1,25*	*239,29*	*1,42*	*111*	*111*	*1,00*	*86,83*	*0,78*
of which Cooperative research	*148*	*1 122*	*7,58*	*73,50*	*0,50*	*31*	*248*	*8,00*	*15,31*	*0,49*
of which Exploratory awards	*835*	*1 776*	*2,13*	*18,60*	*0,02*	*188*	*405*	*2,15*	*3,90*	*0,02*
Fellowships	2 960	2 960	1,00	468,06	0,16	875	958	1,09	140,50	0,16
Support to networks	802	7 648	9,54	892,95	1,11	252	2 494	9,90	278,25	1,10
Concerted actions	266	3 240	12,18	193,34	0,73	34	366	10,76	14,25	0,42
Accompanying measures	1 558	4 604	2,96	873,58	0,56	549	1 424	2,59	187,29	0,34
Total	**16 243**	**92 513**	**5,70**	**20 316,87**	**1,25**	**3 561**	**18 440**	**5,18**	**3 329,73**	**0,94**

TABLE 1B: FP5 OVERVIEW: CONTRACTS SIGNED IN 1999 - ALL FPs OVERVIEW: CONTRACTS UNDER WAY (1)

	FP5 CONTRACTS SIGNED IN 1999							CONTRACTS UNDER WAY (ALL FPs) (4) (4a)	
	A	B	C=B/A	D	E	F=E/A	G	H	I
	Number of contracts signed	Number of participations	Average number of participations per contract	Average number of countries per contract	Total Community financial contribution (€ million) (5)	Average financial contribution per contract (€ million)	Average duration of signed contracts (in months)	Number of contracts under way at 31.12.99	Total payments 1999 (€ million)
Shared-cost actions	696	3 741	5,38	3,38	1 032,08	1,48	33,58		
of which R&D projects	*549*	*3 200*	*5,83*	*3,61*	*959,30*	*1,75*	*38,65*		
of which Demonstration projects	*4*	*45*	*11,25*	*5,25*	*2,21*	*0,55*	*27,00*		
of which Combined projects	*32*	*290*	*9,06*	*4,53*	*54,88*	*1,72*	*29,13*		
of which Support to infrastructures	*16*	*16*	*1,00*	*1,00*	*13,57*	*0,85*	*36,00*	6 946	1 760,83
of which Cooperative research									
of which Exploratory awards	*95*	*190*	*2,00*	*2,00*	*2,12*	*0,02*	*5,69*		
Fellowships	242	242	1,00	1,00	28,48	0,12	22,22		
Support to networks	13	67	5,15	4,08	14,89	1,15	35,88		
Concerted actions								420	63,99
Accompanying measures	73	256	3,51	2,66	85,16	1,17	25,59	1 518	174,97
Total	**1 024**	**4 306**	**4,21**	**2,77**	**1 160,62**	**1,13**	**30,36**	**8 884**	**1 999,79**

TABLE 1C: FP5 OVERVIEW: CONTRACTS SIGNED UNTIL 31 MARCH 2000 (BUDGET 1999) (1)

	FP5 CONTRACTS SIGNED UNTIL 31 MARCH 2000 (BUDGET 1999)						
	A	B	C=B/A	D	E	F=E/A	G
	Number of contracts signed	Number of participations	Average number of participations per contract	Average number of countries per contract	Total Community financial contribution (€ million) (5)	Average financial contribution per contract (€ million)	Average duration of signed contracts (in months)
Shared-cost actions	1 504	9 798	6,51	3,95	2 267,96	1,51	34,46
of which R&D projects	*1 235*	*8 898*	*7,20*	*4,32*	*2 036,94*	*1,65*	*36,85*
of which Demonstration projects	*4*	*45*	*11,25*	*5,25*	*2,21*	*0,55*	*27,00*
of which Combined projects	*56*	*545*	*9,73*	*4,91*	*141,62*	*2,53*	*31,43*
of which Support to infrastructures	*108*	*108*	*1,00*	*1,00*	*84,94*	*0,79*	*36,00*
of which Cooperative research							
of which Exploratory awards	*101*	*202*	*2,00*	*2,00*	*2,25*	*0,02*	*5,57*
Fellowships	550	550	1,00	1,00	70,12	0,13	21,84
Support to networks	77	647	8,40	6,08	76,50	0,99	39,64
Concerted actions	1	8	8,00		0,58	0,58	24,00
Accompanying measures	301	577	1,92	1,66	107,01	0,36	31,44
Total	**2 433**	**11 580**	**4,76**	**3,07**	**2 522,19**	**1,04**	**31,39**

TABLE 2A: FP5: CONTRACTS SIGNED UNTIL 31 MARCH 2000 (BUDGET 1999) BY TYPE OF FINANCIAL PARTICIPATION (1)

	ALL FP5 CONTRACTS SIGNED					SHARED-COST ACTIONS		FELLOWSHIPS		SUPPORT TO NETWORKS		CONCERTED ACTIONS		ACCOMPANYING MEASURES	
	A	B	C=B/A	D	E=D/A	F	G	H	I	J	K	L	M	N	O
	Number of contracts signed	Number of participations	Average number of participations per contract	Community financial contribution (€ million)	Average financial contribution per contract (€ million)	Number of contracts signed	Community financial contrib. (€ million)	Number of contracts signed	Community financial contrib. (€ million)	Number of contracts signed	Community financial contrib. (€ million)	Number of contracts signed	Community financial contrib. (€ million)	Number of contracts signed	Community financial contrib. (€ million)
QUALITY OF LIFE	**341**	**1 987**	**5,83**	**413,83**	**1,21**	**277**	**407,40**	**64**	**6,43**						
1- Food, nutrition and health	51	342	6,71	57,72	1,13	46	57,09	6	0,64						
2- Control of infectious diseases	42	269	6,40	67,16	1,60	35	66,42	7	0,74						
3- The "cell factory"	54	302	5,59	71,05	1,32	43	70,11	11	0,94						
4- Environment and health	28	179	6,39	32,30	1,15	23	31,82	5	0,49						
5- Sustainable agriculture, fisheries and forestry	66	260	4,46	39,13	0,70	43	37,85	13	1,28						
6- The ageing population and disabilities	35	206	5,89	39,43	1,13	29	38,83	6	0,60						
RTD activities of a generic nature	59	412	6,98	102,31	1,73	57	102,09	2	0,23						
Support to infrastructures	16	27	1,69	4,72	0,29	2	3,20	14	1,52						
INFORMATION SOCIETY	**474**	**3 434**	**7,24**	**794,66**	**1,68**	**416**	**738,91**	**10**	**2,89**	**6**	**5,12**			**42**	**47,74**
1- Systems and services for the citizen	85	779	9,16	146,82	1,72	83	143,87							2	1,95
2- New methods of work and electronic commerce	76	563	7,41	122,29	1,61	76	122,29								
3- Multimedia content and tools	81	605	7,47	126,44	1,56	72	116,02			1	0,95			8	9,47
4- Essential technologies and infrastructures	145	969	6,68	288,44	1,99	123	263,87							22	24,57
Cross-programme themes	96	315	5,63	68,32	1,22	31	49,51	10	2,88	5	4,17			10	11,75
RTD activities of a generic nature	31	203	6,55	43,35	1,40	31	43,35								
Support to infrastructures															
SUSTAINABLE GROWTH	**315**	**2 623**	**8,33**	**584,58**	**1,86**	**296**	**532,33**			**8**	**11,17**			**11**	**41,07**
1- Innovative products, processes and organisation	102	626	6,13	121,28	1,19	99	121,03							3	0,25
2- Sustainable mobility and intermodality	32	330	10,31	88,90	2,77	17	36,50			8	11,17			7	40,83
3- Land transport and marine technologies	33	314	9,52	52,16	1,58	33	52,16								
4- New perspectives for aeronautics	43	595	13,84	179,06	4,16	43	179,06								
RTD activities of a generic nature	105	759	7,23	143,59	1,37	104	143,57							1	0,02
Support to infrastructures															
ENERGY & ENVIRONMENT	**154**	**1 146**	**7,44**	**173,82**	**1,13**	**154**	**173,82**								
ENVIRONMENT	**303**	**822**	**7,08**	**323,77**	**1,20**	**303**	**323,77**								
1- Sustainable management and quality of water	22	170	7,73	29,65	1,35	22	29,65								
2- Global change, climate and biodiversity	41	353	8,61	48,67	1,19	41	48,67								
3- Sustainable marine ecosystems	16	119	7,44	23,49	1,47	16	23,49								
4- The city of tomorrow and cultural heritage	8	65	8,13	6,80	0,85	8	6,80								
RTD activities of a generic nature	12	80	6,67	9,49	0,79	12	9,49								
Support for research infrastructures	4	35	8,75	5,67	1,42	4	5,67								
ENERGY	**51**	**324**	**6,35**	**50,05**	**0,98**	**51**	**50,05**								
1- Cleaner energy systems, incl. renewables	22	125	5,68	21,38	0,97	22	21,38								
2- Economic and efficient energy	25	175	7,00	27,50	1,10	25	27,50								
RTD activities of a generic nature	4	24	6,00	1,17	0,29	4	1,17								

TABLE 2A: FP5: CONTRACTS SIGNED UNTIL 31 MARCH 2000 (BUDGET 1999) BY TYPE OF FINANCIAL PARTICIPATION (1)

(continued)

	ALL FP5 CONTRACTS SIGNED					SHARED-COST ACTIONS		FELLOWSHIPS		SUPPORT TO NETWORKS		CONCERTED ACTIONS		ACCOMPANYING MEASURES	
	A	B	C=B/A	D	E=D/A	F	G	H	I	J	K	L	M	N	O
	Number of contracts signed	Number of participations	Average number of participations per contract	Community financial contribution (€ million)	Average financial contribution per contract (€ million)	Number of contracts signed	Community financial contrib. (€ million)	Number of contracts signed	Community financial contrib. (€ million)	Number of contracts signed	Community financial contrib. (€ million)	Number of contracts signed	Community financial contrib. (€ million)	Number of contracts signed	Community financial contrib. (€ million)
NUCLEAR ENERGY	**182**	**419**	**2,30**	**265,73**	**1,46**	**178**	**265,29**	**4**	**0,44**						
Controlled thermonuclear fusion	157	191	1,22	241,69	1,54	153	241,25	4	0,44						
Nuclear fission	12	129	10,75	11,36	0,95	12	11,36								
RTD activities of a generic nature	13	99	7,62	12,68	0,98	13	12,68								
Support for infrastructures															
INTERNATIONAL ROLE	**54**	**164**	**3,04**	**21,61**	**0,40**	**19**	**17,04**	**11**	**1,13**			**1**	**0,58**	**23**	**2,85**
Countries in the pre-accession phase	10	18	1,80	0,40	0,04									10	0,40
MS and CEEC not in the pre-accession phase															
Mediterranean partner countries	13	78	6,00	9,31	0,72	11	8,67					1	0,58	1	0,06
Developing countries	20	57	2,85	10,76	0,54	8	8,37							12	2,39
Emerging economies and industrialised cies															
Fellowships for developing countries															
Fellowships for Community researchers	11	11	1,00	1,13	0,10			11	1,13						
Coordination															
INNOVATION-SMEs	**16**	**118**	**7,38**	**12,22**	**0,76**	**10**	**7,90**							**6**	**4,32**
Innovation projects	16	118	7,38	12,22	0,76	10	7,90							6	4,32
Economic and technological intelligence															
HUMAN POTENTIAL	**897**	**1 689**	**1,88**	**255,74**	**0,29**	**154**	**125,27**	**461**	**59,23**	**63**	**68,71**			**219**	**11,03**
Training and mobility of researchers	601	767	1,53	109,79	0,22			461	59,23	40	50,56				
Access to research infrastructures	131	321	2,45	104,98	0,80	123	101,43			8	3,55				
Promotion of S&T excellence	223	284	1,27	12,42	0,06					6	1,90			217	10,52
Improving the socio-economic knowledge base	36	245	6,81	25,76	0,72	31	23,84			5	1,92				
Support for the dvnt. of S&T policies	6	72	12,00	2,79	0,47					4	2,28			2	0,51
FP5 TOTAL	**2 433**	**11 580**	**4,76**	**2 522,19**	**1,04**	**1 584**	**2 267,96**	**550**	**70,12**	**77**	**76,50**	**1**	**0,58**	**361**	**107,01**

TABLE 2B: FP5: CONTRACTS SIGNED UNTIL 31 MARCH 2000 (BUDGET 1999) BY TYPE OF SHARED-COST ACTIONS (1)

	TOTAL SHARED-COST ACTIONS					R&D PROJECTS		DEMONSTRATION PROJECTS		COMBINED PROJECTS		SUPPORT TO INFRASTRUCTURES		COOPERATIVE RESEARCH		EXPLORATORY AWARDS	
	A	B	C=B/A	D	E=D/A	F	G	H	I	J	K	L	M	N	O	P	Q
	Number of contracts signed	Number of participations	Average number of participations per contract	Community financial contribution (€ million)	Average financial contribution per contract (€ million)	Number of contracts signed	Community financial contrib. (€ million)	Number of contracts signed	Community financial contrib. (€ million)	Number of contracts signed	Community financial contrib. (€ million)	Number of contracts signed	Community financial contrib. (€ million)	Number of contracts signed	Community financial contrib. (€ million)	Number of contracts signed	Community financial contrib. (€ million)
QUALITY OF LIFE	**277**	**1 923**	**6,94**	**407,40**	**1,47**	**234**	**406,44**									**43**	**0,96**
1- Food, nutrition and health	45	336	7,47	57,09	1,27	31	56,77									14	0,31
2- Control of infectious diseases	35	262	7,49	66,42	1,90	33	66,36									2	0,05
3- The "cell factory"	43	291	6,77	70,11	1,63	35	69,93									8	0,18
4- Environment and health	23	174	7,57	31,82	1,38	21	31,77									2	0,05
5- Sustainable agriculture, fisheries and forestry	43	237	5,51	37,85	0,88	29	37,54									14	0,31
6- The ageing population and disabilities	29	200	6,90	38,83	1,34	27	38,78									2	0,05
RTD activities of a generic nature	57	410	7,19	102,09	1,79	66	102,06									1	0,02
Support to infrastructures	2	13	6,50	3,20	1,60	2	3,20										0,00
INFORMATION SOCIETY	**416**	**3 208**	**7,71**	**738,91**	**1,78**	**373**	**680,32**	**4**	**2,21**	**33**	**56,25**					**6**	**0,13**
1- Systems and services for the citizen	63	769	9,27	143,86	1,73	60	125,17	3	1,51	12	17,18						
2- New methods of work and electronic commerce	76	563	7,41	122,30	1,61	65	102,42	1	0,70	10	19,18						
3- Multimedia content and tools	72	555	7,71	116,02	1,61	68	108,80			4	7,20						
4- Essential technologies and infrastructures	123	681	7,16	263,86	2,15	121	260,87			2	3,01						
Cross-programme themes	31	237	7,65	49,51	1,60	21	41,25			4	8,13					6	0,13
RTD activities of a generic nature	31	203	6,55	43,34	1,40	30	41,79			1	1,55						
Support to infrastructures																	
SUSTAINABLE GROWTH	**296**	**2 504**	**8,46**	**532,33**	**1,80**	**230**	**453,55**			**14**	**77,62**					**52**	**1,16**
1- Innovative products, processes and organisation	99	615	6,21	121,03	1,22	67	111,21			4	9,20					28	0,63
2- Sustainable mobility and intermodality	17	222	13,06	36,50	2,15	15	29,96			2	6,53						
3- Land transport and marine technologies	33	314	9,52	52,16	1,58	27	50,25			1	1,80					5	0,11
4- New perspectives for aeronautics	43	586	13,84	179,06	4,16	40	125,52			2	53,52					1	0,02
RTD activities of a generic nature	104	758	7,29	143,57	1,38	81	136,61			5	6,57					18	0,40
Support to infrastructures																	
ENERGY & ENVIRONMENT	**154**	**1 146**	**7,44**	**173,82**	**1,13**	**154**	**173,82**										
ENVIRONMENT	***103***	***822***	***7,98***	***123,77***	***1,20***	***103***	***123,77***										
1- Sustainable management and quality of water	22	170	7,73	29,65	1,35	22	29,65										
2- Global change, climate and biodiversity	41	353	8,61	48,67	1,19	41	48,67										
3- Sustainable marine ecosystems	16	119	7,44	23,49	1,47	16	23,49										
4- The city of tomorrow and cultural heritage	8	65	8,13	6,80	0,85	8	6,80										
RTD activities of a generic nature	12	80	6,67	9,49	0,79	12	9,49										
Support for research infrastructures	4	35	8,75	5,67	1,42	4	5,67										
ENERGY	***51***	***324***	***6,35***	***50,05***	***0,98***	***51***	***50,05***										
1- Cleaner energy systems, incl. renewables	22	125	5,68	21,38	0,97	22	21,38										
2- Economic and efficient energy	25	175	7,00	27,50	1,10	25	27,50										
RTD activities of a generic nature	4	24	6,00	1,17	0,29	4	1,17										

TABLE 2B: FP5: CONTRACTS SIGNED UNTIL 31 MARCH 2000 (BUDGET 1999) BY TYPE OF SHARED-COST ACTIONS (1)

(continued)

	TOTAL SHARED-COST ACTIONS					R&D PROJECTS		DEMONSTRATION PROJECTS		COMBINED PROJECTS		SUPPORT TO INFRASTRUCTURES		COOPERATIVE RESEARCH		EXPLORATORY AWARDS	
	A	B	C=B/A	D	E=D/A	F	G	H	I	J	K	L	M	N	O	P	Q
	Number of contracts signed	Number of participations	Average number of participations per contract	Community financial contribution (€ million)	Average financial contribution per contract (€ million)	Number of contracts signed	Community financial contrib. (€ million)	Number of contracts signed	Community financial contrib. (€ million)	Number of contracts signed	Community financial contrib. (€ million)	Number of contracts signed	Community financial contrib. (€ million)	Number of contracts signed	Community financial contrib. (€ million)	Number of contracts signed	Community financial contrib. (€ million)
NUCLEAR ENERGY	**178**	**415**	**2,33**	**265,29**	**1,49**	**178**	**265,29**										
Controlled thermonuclear fusion	153	187	1,22	241,25	1,58	153	241,25										
Nuclear fission	12	129	10,75	11,36	0,95	12	11,36										
RTD activities of a generic nature	13	99	7,62	12,68	0,98	13	12,68										
Support for infrastructures																	
INTERNATIONAL ROLE	**19**	**113**	**5,95**	**17,04**	**0,90**	**19**	**17,04**										
Countries in the pre-accession phase																	
NIS and CEEC not in the pre-accession phase																	
Mediterranean partner countries	11	69	6,27	8,67	0,79	11	8,67										
Developing countries	8	44	5,50	8,37	1,05	8	8,37										
Emerging economies and industrialised cies																	
Fellowships for developing countries																	
Fellowships for Community researchers																	
Coordination																	
INNOVATION SMEs	**10**	**84**	**8,40**	**7,90**	**0,79**	**1**	**0,15**			**9**	**7,75**						
Innovation projects	10	84	8,40	7,90	0,79	1	0,15			9	7,75						
Economic and technological intelligence																	
HUMAN POTENTIAL	**154**	**405**	**2,63**	**125,27**	**0,81**	**46**	**40,33**					**108**	**84,94**				
Training and mobility of researchers																	
Access to research infrastructures	123	213	1,73	101,43	0,82	15	16,49					108	84,94				
Promotion of S&T excellence																	
Improving the socio-economic knowledge base	31	192	6,19	23,84	0,77	31	23,84										
Support for the dvel. of S&T policies																	
FP5 TOTAL	**1 504**	**9 798**	**6,51**	**2 267,96**	**1,51**	**1 235**	**2 036,94**	**4**	**2,21**	**56**	**141,62**	**108**	**84,94**			**101**	**2,25**

TABLE 3: FP4: CONTRACTS UNDER WAY, CUMULATIVE FIGURES AND PAYMENTS

	ALL TYPES OF CONTRACTS						
	A	B	C	D	E	F	G
	Number of contracts under way at 31.12.99 (4)	Of which, number of shared-cost actions under way at 31.12.99 (4)	Overall number of contracts (6)	Overall number of participations (6)	Overall FP4 financial contribution (€ million) (6)	1999 FP4 payments (€ million)	Overall FP4 payments (€ million)
Telematics applications	377	370	703	7 292	835,84	75,16	675,88
Communication technologies	65	55	228	3 011	625,35	73,44	563,41
Information technologies	674	439	2 021	10 836	1.978,95	314,67	1.569,69
Industrial and materials technologies	1 075	1 012	2 606	15 047	1.708,45	289,33	1.231,22
Standards, measurements & testing	228	204	574	2 865	169,87	30,91	131,68
Environment and climate	408	312	1 211	5 306	547,84	89,02	464,32
Marine science and technology	115	75	335	1 548	232,84	39,97	194,31
Biotechnology	409	269	1 080	3 496	581,65	83,00	438,73
Biomedicine and health	425	199	1 043	2 931	364,33	44,54	273,85
Agriculture and fisheries	591	369	1 354	6 142	591,49	85,50	381,96
Non-nuclear energy	755	574	2 027	8 663	1.014,90	164,84	599,69
Transport	82	70	284	2 746	249,61	43,96	208,56
Targeted socio-economic research	105	100	283	1 280	97,49	14,09	72,20
International cooperation	875	650	2 640	7 340	462,40	102,73	385,84
Dissemination & utilization of the results	77	77	759	2 642	297,70	0,61	161,83
Training and mobility of researchers	1 476	1 148	4 034	5 973	775,17	122,48	536,35
Competitive S/T support (5)						27,92	87,67
Nuclear fission safety	41	9	313	1 533	136,74	25,02	130,04
Controlled thermonuclear fusion	53	43	706	810	815,91	52,46	653,69
FP4 TOTAL	**7 831**	**5 975**	**22 201**	**89 461**	**11 486,53**	**1 679,65**	**8 760,92**

TABLE 4A: FP5: CONTRACTS SIGNED UNTIL 31 MARCH 2000 (BUDGET 1999) BY TYPE OF ORGANISATION

(contributions in million euros)

	TYPES OF ORGANISATIONS (7)										of which SMEs (7a)			
	Enterprise sector		Higher education		Research centres (including JRC)		Others (8)		Total		Total no of SMEs		SMEs of the enterprise sector	
	Contribution	Participations	Contribution	Participations	Contribution	Participations	Contribution	Participations	Contribution	Participations	Contribution	Participations	Contribution	Participations
QUALITY OF LIFE	**23,78**	**187**	**196,82**	**881**	**172,03**	**722**	**22,00**	**197**	**413,83**	**1 987**	**30,56**	**161**	**8,69**	**63**
1- Food, nutrition and health	2,18	32	24,48	118	26,85	135	4,21	57	57,72	342	3,70	34	0,86	13
2- Control of infectious diseases	4,36	24	30,29	130	27,36	95	5,15	20	67,16	269	3,81	10	0,08	1
3- The "cell factory"	7,43	42	33,66	134	26,72	98	3,03	28	71,05	302	10,12	36	4,21	19
4- Environment and health	0,37	2	17,75	91	12,57	69	1,52	17	32,30	179	0,94	6		
5- Sustainable agriculture, fisheries and forestry	4,49	55	15,10	73	18,70	89	0,84	33	39,13	250	6,26	40	1,31	16
6- The ageing population and disabilities	1,50	10	24,46	117	11,27	58	2,19	21	39,43	206	1,58	12	0,82	5
RTD activities of a generic nature	3,44	22	47,71	200	46,10	169	5,06	21	102,31	412	3,99	22	1,41	9
Support to infrastructures			2,36	18	2,36	9			4,72	27	0,15	1		
INFORMATION SOCIETY	**339,26**	**1 374**	**175,71**	**774**	**201,83**	**706**	**77,86**	**500**	**794,66**	**3 434**	**214,37**	**998**	**145,35**	**650**
1- Systems and services for the citizen	62,49	316	31,66	136	28,80	145	22,87	182	145,82	779	44,38	233	28,54	145
2- New methods of work and electronic commerce	67,76	318	22,53	99	21,77	91	10,23	55	122,29	563	43,75	229	31,62	164
3- Multimedia content and tools	46,42	203	35,56	169	29,46	128	15,00	105	126,44	605	39,35	200	24,83	120
4- Essential technologies and infrastructures	135,16	412	44,62	194	94,19	294	14,47	69	288,44	969	68,06	251	47,67	168
Cross-programme themes	24,48	112	17,86	61	11,57	56	14,41	86	68,32	315	16,19	72	11,77	48
RTD activities of a generic nature	2,95	13	23,48	115	16,04	72	0,88	3	43,35	203	2,64	13	0,92	5
Support to infrastructures														
SUSTAINABLE GROWTH	**282,23**	**1 258**	**118,10**	**526**	**154,41**	**680**	**29,84**	**157**	**584,58**	**2 623**	**91,25**	**649**	**66,43**	**515**
1- Innovative products, processes and organisation	60,05	368	30,11	113	27,97	119	3,13	25	121,26	625	33,83	246	28,69	216
2- Sustainable mobility and intermodality	46,56	120	8,71	56	27,48	99	6,76	55	88,50	330	13,43	74	5,86	38
3- Land transport and marine technologies	20,35	150	13,91	66	15,36	79	2,54	19	52,16	314	6,88	64	4,87	53
4- New perspectives for aeronautics	102,09	283	28,70	141	34,02	146	14,25	26	179,06	596	9,65	67	7,48	46
RTD activities of a generic nature	54,19	337	36,67	152	49,58	238	3,15	32	143,59	759	27,45	198	19,53	162
Support to infrastructures														
ENERGY & ENVIRONMENT	**22,76**	**173**	**70,38**	**421**	**74,26**	**484**	**6,42**	**68**	**173,82**	**1 146**	**27,80**	**209**	**8,57**	**75**
ENVIRONMENT	***5,99***	***52***	***58,00***	***353***	***54,67***	***364***	***5,11***	***53***	***123,77***	***822***	***17,92***	***134***	***3,12***	***32***
1- Sustainable management and quality of water	2,14	12	16,99	87	10,27	61	0,25	10	29,65	170	3,79	27	1,21	7
2- Global change, climate and biodiversity	0,28	4	20,89	150	24,43	182	3,07	17	48,67	353	5,29	35	0,06	1
3- Sustainable marine ecosystems	0,47	6	11,87	56	11,09	54	0,06	3	23,49	119	3,80	21	0,47	6
4- The city of tomorrow and cultural heritage	0,84	12	2,50	18	2,46	19	1,00	16	6,80	65	2,00	24	0,57	9
RTD activities of a generic nature	2,22	17	3,13	25	3,66	32	0,48	6	9,49	80	2,34	24	0,77	8
Support for research infrastructures	0,04	1	2,62	17	2,76	16	0,25	1	5,67	35	0,70	3	0,04	1
ENERGY	***16,77***	***121***	***12,38***	***68***	***19,59***	***120***	***1,31***	***15***	***50,05***	***324***	***9,88***	***75***	***5,45***	***43***
1- Cleaner energy systems, incl. renewables	6,96	43	5,40	30	8,24	43	0,78	9	21,38	125	3,63	24	1,72	13
2- Economic and efficient energy	9,72	75	6,79	34	10,50	61	0,49	5	27,50	175	5,73	42	3,67	28
RTD activities of a generic nature	0,09	3	0,19	4	0,85	16	0,04	1	1,17	24	0,52	9	0,06	2

TABLE 4A: FP5: CONTRACTS SIGNED UNTIL 31 MARCH 2000 (BUDGET 1999) BY TYPE OF ORGANISATION

(continued) (contributions in million euros)

	TYPES OF ORGANISATIONS (7)										of which SMEs (7a)			
	Enterprise sector		Higher education		Research centres (including JRC)		Others (8)		Total		Total no of SMEs		SMEs of the enterprise sector	
	Contribution	Participations	Contribution	Participations	Contribution	Participations	Contribution	Participations	**Contribution**	**Participations**	Contribution	Participations	Contribution	Participations
NUCLEAR ENERGY	**6,78**	**50**	**17,74**	**81**	**239,50**	**263**	**1,31**	**25**	**265,73**	**419**	**2,02**	**18**	**1,26**	**7**
Controlled thermonuclear fusion	3,28	14	11,41	29	226,49	133	0,51	15	241,69	191				
Nuclear fission	3,46	35	1,50	17	5,94	71	0,46	6	11,36	129	1,67	11	1,26	7
RTD activities of a generic nature	0,04	1	4,83	35	7,47	59	0,34	4	12,68	99	0,35	7		
Support for infrastructures														
INTERNATIONAL ROLE	**0,86**	**9**	**9,11**	**67**	**8,68**	**56**	**2,96**	**32**	**21,61**	**164**	**1,08**	**7**		
Countries in the pre-accession phase	0,01	1	0,02	1	0,13	6	0,24	10	0,40	18				
NIS and CEEC not in the pre-accession phase														
Mediterranean partner countries	0,47	6	4,97	39	3,26	27	0,60	6	9,31	78	0,40	5		
Developing countries	0,37	2	4,12	27	5,29	23	0,98	5	10,76	57	0,68	2		
Emerging economies and industrialised cies														
Fellowships for developing countries														
Fellowships for Community researchers							1,13	11	1,13	11				
Coordination														
INNOVATION-SMEs	**4,61**	**57**	**2,64**	**19**	**3,05**	**23**	**1,92**	**18**	**12,22**	**117**	**6,77**	**70**	**4,28**	**53**
Innovation projects	4,61	57	2,64	19	3,05	23	1,92	18	12,22	117	6,77	70	4,28	53
Economic and technological intelligence														
HUMAN POTENTIAL	**13,46**	**69**	**115,77**	**892**	**121,39**	**651**	**5,11**	**77**	**255,74**	**1 689**	**n.a.**	**n.a.**	**n.a.**	**n.a.**
Training and mobility of researchers	10,03	45	59,33	456	37,79	249	2,64	17	109,79	767	n.a.	n.a.	n.a.	n.a.
Access to research infrastructures	3,03	11	30,90	115	70,67	191	0,38	4	104,98	321	n.a.	n.a.	n.a.	n.a.
Promotion of S&T excellence	0,15	7	6,26	133	4,57	105	1,42	39	12,42	284	n.a.	n.a.	n.a.	n.a.
Improving the socio-economic knowledge base	0,08	3	18,27	156	7,08	79	0,32	7	25,75	245	n.a.	n.a.	n.a.	n.a.
Support for the devt. of S&T policies	0,17	3	0,99	30	1,28	27	0,35	10	2,79	72	n.a.	n.a.	n.a.	n.a.
FP5 TOTAL	**693,74**	**3 177**	**705,46**	**3 663**	**975,56**	**3 665**	**147,43**	**1 074**	**2 522,19**	**11 579**	**373,84**	**2 112**	**234,58**	**1 363**

TABLE 4B: FP5: CONTRACTS SIGNED UNTIL 31 MARCH 2000 (BUDGET 1999) BY TYPE OF ORGANISATION

(in %)

	TYPES OF ORGANISATIONS (f)										of which SMEs (fa)			
	Enterprise sector		Higher education		Research centres (including JRC)		Others (fi)		Total		Total no of SMEs		SMEs of the enterprise sector	
	Contribution	Participations	Contribution	Participations	Contribution	Participations	Contribution	Participations	Contribution	Participations	Contribution	Participations	Contribution	Participations
QUALITY OF LIFE	**5,7**	**9,4**	**47,4**	**44,3**	**41,6**	**36,3**	**5,3**	**9,9**	**100,0**	**100,0**	**7,4**	**8,1**	**2,1**	**3,2**
1- Food, nutrition and health	3,8	9,4	42,4	34,5	46,5	39,5	7,3	16,7	100,0	100,0	6,4	9,9	1,5	3,8
2- Control of infectious diseases	6,5	8,9	45,1	48,3	40,7	35,3	7,7	7,4	100,0	100,0	5,7	3,7	0,1	0,4
3- The "cell factory"	10,5	13,9	47,7	44,4	37,6	32,5	4,3	9,3	100,0	100,0	14,2	11,9	5,9	6,3
4- Environment and health	1,1	1,1	54,9	50,8	39,2	38,5	4,7	9,5	100,0	100,0	2,9	3,4		
5- Sustainable agriculture, fisheries and forestry	11,5	22,0	38,6	29,2	47,8	35,6	2,2	13,2	100,0	100,0	16,0	16,0	3,3	6,4
6- The ageing population and disabilities	3,8	4,9	62,0	56,8	28,6	28,2	5,6	10,2	100,0	100,0	4,0	5,8	2,1	2,4
RTD activities of a generic nature	3,4	5,3	46,6	48,5	46,1	41,0	4,9	5,1	100,0	100,0	3,9	5,3	1,4	2,2
Support to infrastructures			50,1	66,7	49,9	33,3			100,0	100,0	3,2	3,7		
INFORMATION SOCIETY	**42,7**	**40,0**	**22,1**	**22,5**	**25,4**	**22,9**	**9,8**	**14,6**	**100,0**	**100,0**	**27,0**	**29,1**	**18,3**	**18,9**
1- Systems and services for the citizen	42,9	40,6	21,7	17,5	19,8	18,6	15,7	23,4	100,0	100,0	30,4	29,9	19,6	18,6
2- New methods of work and electronic commerce	55,4	56,5	18,4	17,6	17,8	16,2	8,4	9,8	100,0	100,0	35,8	40,7	25,9	29,1
3- Multimedia content and tools	36,7	33,6	28,1	27,9	23,3	21,2	11,9	17,4	100,0	100,0	31,1	33,1	19,6	19,8
4- Essential technologies and infrastructures	46,9	42,5	15,5	20,0	32,7	30,3	5,0	7,1	100,0	100,0	23,6	25,9	16,5	17,3
Cross-programme themes	35,8	35,6	26,1	19,4	16,9	17,8	21,1	27,3	100,0	100,0	23,7	22,9	17,2	15,2
RTD activities of a generic nature	6,8	6,4	54,2	56,7	37,0	35,5	2,0	1,5	100,0	100,0	6,1	6,4	2,1	2,5
Support to infrastructures														
SUSTAINABLE GROWTH	**48,3**	**48,0**	**20,2**	**20,1**	**26,4**	**25,9**	**5,1**	**6,0**	**100,0**	**100,0**	**15,6**	**24,7**	**11,4**	**19,6**
1- Innovative products, processes and organisation	49,5	58,9	24,8	18,1	23,1	19,0	2,6	4,0	100,0	100,0	27,9	39,4	23,7	34,6
2- Sustainable mobility and intermodality	51,5	36,4	9,8	17,0	31,0	30,0	7,6	16,7	100,0	100,0	15,2	22,4	6,6	11,5
3- Land transport and marine technologies	39,0	47,8	26,7	21,0	29,4	25,2	4,9	6,1	100,0	100,0	13,2	20,4	9,3	16,9
4- New perspectives for aeronautics	57,0	47,6	16,0	23,7	19,0	24,4	8,0	4,4	100,0	100,0	5,4	11,3	4,2	7,7
RTD activities of a generic nature	37,7	44,4	25,5	20,0	34,5	31,4	2,2	4,2	100,0	100,0	19,1	26,1	13,6	21,3
Support to infrastructures														
ENERGY & ENVIRONMENT	**13,1**	**15,1**	**40,5**	**36,7**	**42,7**	**42,2**	**3,7**	**5,9**	**100,0**	**100,0**	**16,0**	**18,2**	**4,9**	**6,5**
ENVIRONMENT	***4,8***	***6,3***	***46,9***	***42,9***	***44,2***	***44,3***	***4,1***	***6,4***	***100,0***	***100,0***	***14,5***	***16,3***	***2,5***	***3,9***
1- Sustainable management and quality of water	7,2	7,1	57,3	51,2	34,6	35,9	0,8	5,9	100,0	100,0	12,8	15,9	4,1	4,1
2- Global change, climate and biodiversity	0,6	1,1	42,9	42,5	50,2	51,6	6,3	4,8	100,0	100,0	10,9	9,9	0,1	0,3
3- Sustainable marine ecosystems	2,0	5,0	50,5	47,1	47,2	45,4	0,3	2,5	100,0	100,0	16,2	17,6	2,0	5,0
4- The city of tomorrow and cultural heritage	12,4	18,5	36,8	27,7	36,2	29,2	14,7	24,6	100,0	100,0	29,4	36,9	8,4	13,8
RTD activities of a generic nature	23,4	21,3	33,0	31,3	38,6	40,0	5,1	7,5	100,0	100,0	24,7	30,0	8,1	10,0
Support for research infrastructures	0,7	2,9	46,2	48,6	48,7	45,7	4,4	2,9	100,0	100,0	12,3	8,6	0,7	2,9
ENERGY	***33,5***	***37,3***	***24,7***	***21,0***	***39,1***	***37,0***	***2,6***	***4,6***	***100,0***	***100,0***	***19,7***	***23,1***	***10,9***	***13,3***
1- Cleaner energy systems, incl. renewables	32,6	34,4	26,3	24,0	38,5	34,4	3,6	7,2	100,0	100,0	17,0	19,2	8,0	10,4
2- Economic and efficient energy	35,3	42,9	24,7	19,4	38,2	34,9	1,8	2,9	100,0	100,0	20,8	24,0	13,3	16,0
RTD activities of a generic nature	7,7	12,5	16,2	16,7	72,6	66,7	3,4	4,2	100,0	100,0	44,4	37,5	5,1	8,3

TABLE 4B: FP5: CONTRACTS SIGNED UNTIL 31 MARCH 2000 (BUDGET 1999) BY TYPE OF ORGANISATION

(continued) (in %)

	TYPES OF ORGANISATIONS (7)										of which SMEs (9a)			
	Enterprise sector		Higher education		Research centres (including JRC)		Others (8)		**Total**		Total no of SMEs		SMEs of the enterprise sector	
	Contribution	Participations	Contribution	Participations	Contribution	Participations	Contribution	Participations	**Contribution**	**Participations**	Contribution	Participations	Contribution	Participations
NUCLEAR ENERGY	**2,6**	**11,9**	**6,7**	**19,3**	**90,3**	**62,8**	**0,5**	**6,0**	**100,0**	**100,0**	**0,8**	**4,3**	**0,5**	**1,7**
Controlled thermonuclear fusion	1,4	7,3	4,7	15,2	93,7	69,6	0,2	7,9	100,0	100,0				
Nuclear fission	30,5	27,1	13,2	13,2	52,3	55,0	4,0	4,7	100,0	100,0	14,7	8,5	11,1	5,4
RTD activities of a generic nature	0,3	1,0	38,1	35,4	58,9	59,6	2,7	4,0	100,0	100,0	2,8	7,1		
Support for infrastructures														
INTERNATIONAL ROLE	**4,0**	**5,5**	**42,1**	**40,9**	**40,2**	**34,1**	**13,7**	**19,5**	**100,0**	**100,0**	**5,0**	**4,3**		
Countries in the pre-accession phase	3,0	5,6	4,0	5,6	32,6	33,3	60,5	55,6	100,0	100,0				
NIS and CEEC not in the pre-accession phase														
Mediterranean partner countries	5,1	7,7	53,4	50,0	35,1	34,6	6,5	7,7	100,0	100,0	4,3	6,4		
Developing countries	3,5	3,5	38,3	47,4	49,1	40,4	9,1	8,8	100,0	100,0	6,3	3,5		
Emerging economies and industrialised cies														
Fellowships for developing countries														
Fellowships for Community researchers							100,0	100,0	100,0	100,0				
Coordination														
INNOVATION-SMEs	**37,7**	**48,7**	**21,6**	**16,2**	**25,0**	**19,7**	**15,7**	**15,4**	**100,0**	**100,0**	**55,4**	**59,8**	**35,0**	**45,3**
Innovation projects	37,7	48,7	21,6	16,2	25,0	19,7	15,7	15,4	100,0	100,0	55,4	59,8	35,0	45,3
Economic and technological intelligence														
HUMAN POTENTIAL	**5,3**	**4,1**	**45,3**	**52,8**	**47,5**	**38,5**	**2,0**	**4,6**	**100,0**	**100,0**	**n.a.**	**n.a.**	**n.a.**	**n.a.**
Training and mobility of researchers	9,1	5,9	54,0	59,5	34,4	32,5	2,4	2,2	100,0	100,0	n.a.	n.a.	n.a.	n.a.
Access to research infrastructures	2,9	3,4	29,4	35,8	67,3	59,5	0,4	1,2	100,0	100,0	n.a.	n.a.	n.a.	n.a.
Promotion of S&T excellence	1,2	2,5	50,6	46,8	36,8	37,0	11,4	13,7	100,0	100,0	n.a.	n.a.	n.a.	n.a.
Improving the socio-economic knowledge base	0,3	1,2	71,0	63,7	27,5	32,2	1,2	2,9	100,0	100,0	n.a.	n.a.	n.a.	n.a.
Support for the devt. of S&T policies	6,1	4,2	35,5	44,4	45,8	37,5	12,6	13,9	100,0	100,0	n.a.	n.a.	n.a.	n.a.
FP5 TOTAL	**27,5**	**27,4**	**28,0**	**31,6**	**38,7**	**31,7**	**5,8**	**9,3**	**100,0**	**100,0**	**16,5**	**21,4**	**10,3**	**13,8**

TABLE 5A: FP5: SHARED-COST CONTRACTS SIGNED UNTIL 31 MARCH 2000 (BUDGET 1999) BY TYPE OF ORGANISATION

(contributions in millios euros)

	TYPES OF ORGANISATIONS (/)										of which SMEs			
	Enterprise sector		Higher education		Research centres (including JRC)		Others (8)		Total		Total no of SMEs		SMEs of the enterprise sector	
	Contribution	Participations	Contribution	Participations	Contribution	Participations	Contribution	Participations	**Contribution**	**Participations**	Contribution	Participations	Contribution	Participations
QUALITY OF LIFE	**23,78**	**187**	**109,59**	**817**	**172,03**	**722**	**22,01**	**197**	**407,40**	**1 923**	**30,56**	**161**	**8,69**	**63**
1- Food, nutrition and health	2,18	32	23,84	112	26,85	135	4,21	57	57,09	336	3,70	34	0,86	13
2- Control of infectious diseases	4,36	24	29,55	123	27,36	95	5,15	20	66,42	262	3,81	10	0,08	1
3- The "cell factory"	7,43	42	32,94	123	26,72	98	3,03	28	70,11	291	10,12	36	4,21	19
4- Environment and health	0,37	2	17,26	86	12,67	69	1,52	17	31,82	174	0,94	6		
5- Sustainable agriculture, fisheries and forestry	4,49	55	13,81	60	18,70	89	0,84	33	37,85	237	6,26	40	1,31	16
6- The ageing population and disabilities	1,50	10	23,86	111	11,27	68	2,19	21	38,83	200	1,58	12	0,82	5
RTD activities of a generic nature	3,44	22	47,48	198	46,10	169	5,06	21	102,09	410	3,99	22	1,41	9
Support to infrastructures			0,84	4	2,36	9			3,20	13	0,15	1		
INFORMATION SOCIETY	**319,11**	**1 284**	**167,71**	**750**	**181,54**	**714**	**70,55**	**460**	**738,91**	**3 208**	**197,09**	**917**	**133,79**	**601**
1- Systems and services for the citizen	61,74	312	31,48	135	28,36	143	22,30	179	143,87	769	42,66	226	27,61	142
2- New methods of work and electronic commerce	67,76	318	22,53	99	21,77	91	10,23	55	122,29	563	43,75	229	31,03	161
3- Multimedia content and tools	42,03	188	33,82	164	27,00	119	13,17	84	116,02	555	32,77	171	20,77	106
4- Essential technologies and infrastructures	125,95	372	43,84	190	80,17	252	13,91	67	263,87	881	62,91	227	44,01	151
Cross-programme themes	18,66	81	12,56	47	8,21	37	10,06	72	49,51	237	12,66	62	9,72	37
RTD activities of a generic nature	2,95	13	23,48	115	16,04	72	0,88	3	43,35	203	2,36	12	0,65	4
Support to infrastructures														
SUSTAINABLE GROWTH	**248,69**	**1 205**	**116,00**	**512**	**140,97**	**641**	**26,67**	**146**	**532,33**	**2 504**	**83,61**	**601**	**63,39**	**486**
1- Innovative products, processes and organisation	59,83	358	30,11	113	27,97	119	3,13	25	121,03	615	33,61	236	28,46	206
2- Sustainable mobility and intermodality	12,26	78	6,61	40	14,03	60	3,60	44	36,50	222	6,04	37	3,07	20
3- Land transport and marine technologies	20,35	150	13,91	66	15,36	79	2,54	19	52,16	314	6,88	64	4,87	53
4- New perspectives for aeronautics	102,09	283	28,70	141	34,02	145	14,25	26	179,06	595	9,65	67	7,48	46
RTD activities of a generic nature	54,17	336	36,67	152	49,58	238	3,15	32	143,57	758	27,43	197	19,51	161
Support to infrastructures														
ENERGY & ENVIRONMENT	**22,76**	**173**	**70,38**	**421**	**74,26**	**484**	**6,42**	**68**	**173,82**	**1 146**	**27,80**	**209**	**8,57**	**75**
ENVIRONMENT	***5,99***	***52***	***58,00***	***353***	***54,67***	***364***	***5,11***	***53***	***123,77***	***822***	***17,92***	***134***	***3,12***	***32***
1- Sustainable management and quality of water	2,14	12	16,99	87	10,27	61	0,25	10	29,65	170	3,79	27	1,21	7
2- Global change, climate and biodiversity	0,26	4	20,89	160	24,43	182	3,07	17	48,67	363	5,29	35	0,06	1
3- Sustainable marine ecosystems	0,47	6	11,87	56	11,09	54	0,06	3	23,49	119	3,80	21	0,47	6
4- The city of tomorrow and cultural heritage	0,84	12	2,50	18	2,46	19	1,00	16	6,80	65	2,00	24	0,57	9
RTD activities of a generic nature	2,22	17	3,13	25	3,66	32	0,48	6	9,49	80	2,34	24	0,77	8
Support for research infrastructures	0,04	1	2,62	17	2,76	16	0,25	1	5,67	35	0,70	3	0,04	1
ENERGY	***16,77***	***121***	***12,38***	***68***	***19,59***	***120***	***1,31***	***15***	***50,05***	***324***	***9,88***	***75***	***5,45***	***43***
1- Cleaner energy systems, incl. renewables	6,96	43	5,40	30	8,24	43	0,78	9	21,38	125	3,63	24	1,72	13
2- Economic and efficient energy	9,72	75	6,79	34	10,50	61	0,49	5	27,50	175	5,73	42	3,67	28
RTD activities of a generic nature	0,09	3	0,19	4	0,85	16	0,04	1	1,17	24	0,52	9	0,06	2

TABLE 5A: FP5: SHARED-COST CONTRACTS SIGNED UNTIL 31 MARCH 2000 (BUDGET 1999) BY TYPE OF ORGANISATION

(continued) (contributions in million euros)

	TYPES OF ORGANISATIONS (*)										of which SMEs			
	Enterprise sector		Higher education		Research centres (including JRC)		Others (B)		Total		Total no of SMEs		SMEs of the enterprise sector	
	Contribution	Participations	Contribution	Participations	Contribution	Participations	Contribution	Participations	Contribution	Participations	Contribution	Participations	Contribution	Participations
Controlled thermonuclear fusion	3,26	14	11,17	27	226,29	131	0,51	15	241,25	187				
Nuclear fission	3,46	35	1,50	17	5,94	71	0,46	6	11,36	129	1,57	11	1,26	7
RTD activities of a generic nature	0,04	1	4,83	35	7,47	59	0,34	4	12,68	99	0,36	7		
Support for infrastructures														
INTERNATIONAL ROLE	**0,70**	**6**	**8,58**	**56**	**6,87**	**44**	**0,88**	**7**	**17,04**	**113**	**1,08**	**7**		
Countries in the pre-accession phase														
NIS and CEEC not in the pre-accession phase														
Mediterranean partner countries	0,33	4	4,76	35	3,21	26	0,37	4	8,67	69	0,40	5		
Developing countries	0,37	2	3,83	21	3,66	18	0,51	3	8,37	44	0,68	2		
Emerging economies and industrialised cies														
Fellowships for developing countries														
Fellowships for Community researchers														
Coordination														
INNOVATION-SMEs			**2,64**	**19**	**1,86**	**14**	**3,40**	**51**	**7,90**	**84**	**3,77**	**45**		
Innovation projects			2,64	19	1,86	14	3,40	51	7,90	84	3,77	45		
Economic and technological intelligence														
HUMAN POTENTIAL	**2,99**	**12**	**47,11**	**196**	**74,55**	**190**	**0,62**	**7**	**125,27**	**405**	**n.a.**	**n.a.**	**n.a.**	**n.a.**
Training and mobility of researchers											n.a.	n.a.	n.a.	n.a.
Access to research infrastructures	2,91	9	30,07	73	68,08	129	0,37	2	101,43	213	n.a.	n.a.	n.a.	n.a.
Promotion of S&T excellence											n.a.	n.a.	n.a.	n.a.
Improving the socio-economic knowledge base	0,08	3	17,04	123	6,47	61	0,25	5	23,84	192	n.a.	n.a.	n.a.	n.a.
Support for the dvpt. of S&T policies											n.a.	n.a.	n.a.	n.a.
FP5 TOTAL	**618,03**	**2 867**	**687,01**	**2 771**	**652,88**	**2 809**	**130,55**	**936**	**2 002,67**	**9 383**	**343,90**	**1 948**	**214,44**	**1 225**

TABLE 5B: FP5: SHARED-COST CONTRACTS SIGNED UNTIL 31 MARCH 2000 (BUDGET 1999) BY TYPE OF ORGANISATION

(in %)

	TYPES OF ORGANISATIONS (7)										of which SMEs (9a)			
	Enterprise sector		Higher education		Research centres (including JRC)		Others (8)		Total		Total no of SMEs		SMEs of the enterprise sector	
	Contribution	Participations	Contribution	Participations	Contribution	Participations	Contribution	Participations	Contribution	Participations	Contribution	Participations	Contribution	Participations
QUALITY OF LIFE	**5,8**	**9,7**	**46,5**	**42,5**	**42,7**	**37,5**	**5,4**	**10,2**	**100,0**	**100,0**	**7,5**	**8,4**	**2,1**	**3,3**
1- Food, nutrition and health	3,8	9,5	41,8	33,3	47,0	40,2	7,4	17,0	100,0	100,0	6,5	10,1	1,5	3,9
2- Control of infectious diseases	6,6	9,2	44,5	46,9	41,2	36,3	7,8	7,6	100,0	100,0	5,7	3,6	0,1	0,4
3- The "cell factory"	10,6	14,4	47,0	42,3	38,1	33,7	4,3	9,6	100,0	100,0	14,4	12,4	6,0	6,5
4- Environment and health	1,2	1,1	54,3	49,4	39,8	39,7	4,8	9,8	100,0	100,0	3,0	3,4		
5- Sustainable agriculture, fisheries and forestry	11,9	23,2	36,5	25,3	49,4	37,6	2,2	13,9	100,0	100,0	16,5	16,9	3,5	6,8
6- The ageing population and disabilities	3,9	5,0	61,5	55,5	29,0	29,0	5,7	10,5	100,0	100,0	4,1	6,0	2,1	2,5
RTD activities of a generic nature	3,4	5,4	46,5	48,3	46,2	41,2	5,0	5,1	100,0	100,0	3,9	5,4	1,4	2,2
Support to infrastructures			26,4	30,8	73,6	69,2			100,0	100,0	4,7	7,7		
INFORMATION SOCIETY	**43,2**	**40,0**	**22,7**	**23,4**	**24,6**	**22,3**	**9,5**	**14,3**	**100,0**	**100,0**	**26,7**	**28,6**	**18,1**	**18,7**
1- Systems and services for the citizen	42,9	40,6	21,9	17,6	19,7	18,6	15,5	23,3	100,0	100,0	29,6	29,4	19,2	18,5
2- New methods of work and electronic commerce	55,4	56,5	18,4	17,6	17,8	16,2	8,4	9,8	100,0	100,0	35,8	40,7	25,4	28,6
3- Multimedia content and tools	36,2	33,9	29,2	29,5	23,3	21,4	11,4	15,1	100,0	100,0	28,2	30,8	17,9	19,1
4- Essential technologies and infrastructures	47,7	42,2	16,6	21,6	30,4	28,6	5,3	7,6	100,0	100,0	23,8	25,6	16,7	17,1
Cross-programme themes	37,7	34,2	25,4	19,8	16,6	15,6	20,3	30,4	100,0	100,0	25,6	21,9	19,6	15,6
RTD activities of a generic nature	6,8	6,4	54,2	56,7	37,0	35,5	2,0	1,5	100,0	100,0	5,4	5,9	1,5	2,0
Support to infrastructures														
SUSTAINABLE GROWTH	**46,7**	**48,1**	**21,8**	**20,4**	**26,5**	**25,6**	**5,0**	**5,8**	**100,0**	**100,0**	**15,7**	**24,0**	**11,9**	**19,4**
1- Innovative products, processes and organisation	49,4	58,2	24,9	18,4	23,1	19,3	2,6	4,1	100,0	100,0	27,8	38,4	23,5	33,5
2- Sustainable mobility and intermodality	33,6	36,1	18,1	18,0	38,4	27,0	9,9	19,8	100,0	100,0	16,5	16,7	8,4	9,0
3- Land transport and marine technologies	39,0	47,8	26,7	21,0	29,4	25,2	4,9	6,1	100,0	100,0	13,2	20,4	9,3	16,9
4- New perspectives for aeronautics	57,0	47,6	16,0	23,7	19,0	24,4	8,0	4,4	100,0	100,0	5,4	11,3	4,2	7,7
RTD activities of a generic nature	37,7	44,3	25,5	20,1	34,5	31,4	2,2	4,2	100,0	100,0	19,1	26,0	13,6	21,2
Support to infrastructures														
ENERGY & ENVIRONMENT	**13,1**	**15,1**	**40,5**	**36,7**	**42,7**	**42,2**	**3,7**	**5,9**	**100,0**	**100,0**	**16,0**	**18,2**	**4,9**	**6,5**
ENVIRONMENT	***4,8***	***6,3***	***48,9***	***42,9***	***44,2***	***44,3***	***4,1***	***6,4***	***100,0***	***100,0***	***14,5***	***16,3***	***2,5***	***3,9***
1- Sustainable management and quality of water	7,2	7,1	57,3	51,2	34,6	35,9	0,8	5,9	100,0	100,0	12,8	15,9	4,1	4,1
2- Global change, climate and biodiversity	0,6	1,1	42,9	42,5	50,2	51,6	6,3	4,8	100,0	100,0	10,9	9,9	0,1	0,3
3- Sustainable marine ecosystems	2,0	5,0	50,5	47,1	47,2	45,4	0,3	2,5	100,0	100,0	16,2	17,6	2,0	5,0
4- The city of tomorrow and cultural heritage	12,4	18,5	36,8	27,7	36,2	29,2	14,7	24,6	100,0	100,0	29,4	36,9	8,4	13,8
RTD activities of a generic nature	23,4	21,3	33,0	31,3	38,6	40,0	5,1	7,5	100,0	100,0	24,7	30,0	8,1	10,0
Support for research infrastructures	0,7	2,9	46,2	48,6	48,7	45,7	4,4	2,9	100,0	100,0	12,3	8,6	0,7	2,9
ENERGY	***33,5***	***37,3***	***24,7***	***21,0***	***39,1***	***37,0***	***2,6***	***4,6***	***100,0***	***100,0***	***19,7***	***23,1***	***10,9***	***13,1***
1- Cleaner energy systems, incl. renewables	32,6	34,4	25,3	24,0	38,5	34,4	3,6	7,2	100,0	100,0	17,0	19,2	8,0	10,4
2- Economic and efficient energy	35,3	42,9	24,7	19,4	38,2	34,9	1,8	2,9	100,0	100,0	20,8	24,0	13,3	16,0
RTD activities of a generic nature	7,7	12,5	16,2	16,7	72,6	66,7	3,4	4,2	100,0	100,0	44,4	37,5	5,1	8,3

TABLE 5B: FP5: SHARED-COST CONTRACTS SIGNED UNTIL 31 MARCH 2000 (BUDGET 1999) BY TYPE OF ORGANISATION
(continued) (in %)

	TYPES OF ORGANISATIONS (f)										of which SMEs (9a)			
	Enterprise sector		Higher education		Research centres (including JRC)		Others (8)		Total		Total no of SMEs		SMEs of the enterprise sector	
	Contribution	Participations	Contribution	Participations	Contribution	Participations	Contribution	Participations	Contribution	Participations	Contribution	Participations	Contribution	Participations
NUCLEAR ENERGY	**2,6**	**12,0**	**6,6**	**19,0**	**90,4**	**62,9**	**0,5**	**6,0**	**100,0**	**100,0**	**0,0**	**4,3**	**0,5**	**1,7**
Controlled thermonuclear fusion	1,4	7,5	4,6	14,4	93,8	70,1	0,2	8,0	100,0	100,0				
Nuclear fission	30,5	27,1	13,2	13,2	52,3	55,0	4,0	4,7	100,0	100,0	14,7	8,5	11,1	5,4
RTD activities of a generic nature	0,3	1,0	38,1	36,4	58,9	59,6	2,7	4,0	100,0	100,0	2,8	7,1		
Support for infrastructures														
INTERNATIONAL ROLE	**4,1**	**5,3**	**50,4**	**49,6**	**40,3**	**38,9**	**5,2**	**6,2**	**100,0**	**100,0**	**6,3**	**6,2**		
Countries in the pre-accession phase														
NIS and CEEC not in the pre-accession phase														
Mediterranean partner countries	3,8	5,8	54,8	50,7	37,1	37,7	4,3	5,8	100,0	100,0	4,6	7,2		
Developing countries	4,5	4,5	45,8	47,7	43,7	40,9	6,1	6,8	100,0	100,0	8,1	4,5		
Emerging economies and industrialised cies														
Fellowships for developing countries														
Fellowships for Community researchers														
Coordination														
INNOVATION-SMEs			**33,4**	**22,6**	**23,5**	**16,7**	**43,0**	**60,7**	**100,0**	**100,0**	**47,7**	**53,6**		
Innovation projects			33,4	22,6	23,5	16,7	43,0	60,7	100,0	100,0	47,7	53,6		
Economic and technological intelligence														
HUMAN POTENTIAL	**2,4**	**3,0**	**37,6**	**40,4**	**59,5**	**46,9**	**0,5**	**1,7**	**100,0**	**100,0**	**s, o,**	**s, o,**	**s, o,**	**s,o,**
Training and mobility of researchers											s, o,	s, o,	s, o,	s, o,
Access to research infrastructures	2,9	4,2	29,6	34,3	67,1	60,6	0,4	0,9	100,0	100,0	s, o,	s, o,	s, o,	s, o,
Promotion of S&T excellence											s, o,	s, o,	s, o,	s, o,
Improving the socio-economic knowledge base	0,3	1,6	71,5	64,1	27,1	31,8	1,0	2,6	100,0	100,0	s, o,	s, o,	s, o,	s, o,
Support for the devt. of S&T policies											s, o,	s, o,	s, o,	s, o,
FP5 TOTAL	**27,5**	**29,8**	**27,3**	**29,1**	**39,3**	**31,3**	**5,8**	**9,8**	**100,0**	**100,0**	**16,1**	**20,8**	**10,1**	**13,1**

TABLE 6: FP5: PROPOSALS RECEIVED IN 1999 AND CONTRACTS SIGNED UNTIL 31 MARCH 2000 (BUDGET 1999) BY COUNTRY

PROPOSALS RECEIVED IN 1999 (9)	EUROPEAN UNION																CANDIDATE COUNTRIES & COUNTRIES ASSOCIATED TO FP5 (10)																Others & unknown	TOTAL
	B	DK	D	EL	E	F	IRL	I	L	NL	A	P	FIN	S	UK	Tot.	BG	CY	CZ	EE	HU	LV	LT	MT	PL	RO	SK	SI	TR	IS	LI	NO	CH	IL	Tot.		
TOTAL NUMBER OF PARTICIPATIONS	3 282	2 488	12 481	3 902	8 440	9 893	1 637	9 323	853	5 258	2 033	1 870	2 226	3 496	11 934	**76 267**	377	180	865	281	959	170	536	15	1 173	483	329	434	79	184	9	1 587	1 523	571	**9 863**	5 040	**91 260**

CONTRACTS SIGNED UNTIL 31 MARCH 2000 (9)	EUROPEAN UNION																CANDIDATE COUNTRIES & COUNTRIES ASSOCIATED TO FP5 (10)																Others	TOTAL
NUMBER OF PARTICIPATIONS BY SPECIFIC PROGRAMME	B	DK	D	EL	E	F	IRL	I	L	NL	A	P	FIN	S	UK	Tot.	BG	CY	CZ	EE	HU	LV	LT	MT	PL	RO	SK	SI	TR	IS	LI	NO	CH	IL	Tot.		
Quality of life	74	74	293	28	186	262	36	188		186	29	24	69	105	322	**1 784**	3	1	12	7	13	1	2		13	1	5	7		2		26	59	23	**174**	18	**1 976**
Information society	134	62	572	102	223	458	55	446	12	163	79	64	93	88	438	**3 052**	3	5	16		18		2		25	4	4	23		3	1	60	97	36	**294**	53	**3 401**
Sustainable growth	84	54	551	68	160	384	36	246		142	70	39	66	105	365	**2 439**		1	24		17	1	2		24	4	5	7		2	1	44	48	12	**193**	20	**2 623**
Energy-environment	27	44	184	37	79	148	18	108	2	76	23	26	24	42	153	**993**	1	1	12	2	6				10	1	4	2		1	1	55	35	6	**140**	13	**1 136**
of which Environment	*17*	*23*	*124*	*27*	*47*	*84*	*8*	*79*	*1*	*47*	*16*	*12*	*17*	*22*	*109*	***697***	*1*	*1*	*8*	*2*	*4*				*6*	*1*	*1*	*2*		*1*		*42*	*29*	*8*	***97***	*9*	***803***
of which Energy	*10*	*21*	*60*	*10*	*32*	*24*	*3*	*29*	*1*	*29*	*6*	*6*	*7*	*20*	*33*	***282***			*1*		*2*				*2*		*3*				*1*	*13*	*6*	*1*	***29***	*2*	***313***
Nuclear energy	14	9	57	9	22	52	6	44	2	23	5	6	18	23	36	**370**	1		12		5					1	3	1					18		**41**	8	**419**
of which Fission	*8*		*50*	*3*	*17*	*28*	*2*	*24*		*12*	*3*		*8*	*17*	*28*	***200***	*1*		*11*		*4*						*3*	*1*					*6*		***26***	*8*	***228***
of which Fusion	*8*	*8*	*44*	*6*	*8*	*17*	*4*	*28*	*2*	*11*	*6*	*6*	*8*	*17*	*8*	***179***			*2*		*1*					*1*							*12*		***16***		***197***
International role	4	6	13	5	5	6	1	13		6	2	3	1		13	**79**	1	5	1	1	2	1	2	2	2	1	1	1	3					3	**26**	48	**153**
Innovation-SMEs	4	2	13	10	15	13	2	12	1	10	3	6	3	7	7	**108**														5		3	1		**9**		**117**
Human potential	49	46	252	58	165	273	30	166	1	129	29	31	29	46	324	**1 598**	2		9	4	12	3			18	3	3	7		1		21	21	19	**123**	6	**1 689**
TOTAL	**398**	**391**	**1 975**	**391**	**734**	**1 597**	**186**	**1 217**	**18**	**604**	**241**	**195**	**388**	**474**	**1 654**	**10 247**	**11**	**12**	**85**	**14**	**73**	**6**	**8**	**2**	**93**	**15**	**26**	**46**	**3**	**14**	**3**	**269**	**278**	**102**	**1 001**	**166**	**11 514**

TABLE 6: FP5: PROPOSALS RECEIVED IN 1999 AND CONTRACTS SIGNED UNTIL 31 MARCH 2000 (BUDGET 1999) BY COUNTRY

(continued)

CONTRACTS SIGNED UNTIL 31 MARCH 2000 (9)	EUROPEAN UNION																CANDIDATE COUNTRIES & COUNTRIES ASSOCIATED TO FP5 (10)																				Others	TOTAL
NUMBER OF PARTICIPATIONS BY TYPE OF FINANCIAL PARTICIPATION (1)	B	DK	D	EL	E	F	IRL	I	L	NL	A	P	FIN	S	UK	Tot.	BG	CY	CZ	EE	HU	LV	LT	MT	PL	RO	SK	SI	TR	IS	LI	NO	CH	IL	Tot.		
Shared-cost actions	325	248	1739	344	613	1329	159	1059	16	562	218	168	270	432	1332	**8 996**	6	15	79	8	63	2	6	1	79	10	22	28	3	13	3	186	255	15	**872**	132	**9 811**
of which R&D projects	*299*	*234*	*1662*	*329*	*593*	*1230*	*144*	*928*	*16*	*522*	*197*	*161*	*246*	*431*	*1296*	***8 687***	*6*	*9*	*67*	*5*	*53*	*2*	*5*	*1*	*77*	*9*	*21*	*27*	*2*	*5*	*3*	*169*	*245*	*10*	***782***	*122*	***8 682***
of which Demonstration projects	*2*	*1*	*17*	*1*	*4*	*3*		*7*		*2*			*2*		*3*	***37***									*1*							*1*			***2***	*4*	***43***
of which Combined projects	*37*	*31*	*50*	*23*	*28*	*67*	*12*	*88*		*37*	*6*	*8*	*22*	*35*	*42*	***476***			*9*		*9*		*1*		*7*		*1*	*2*		*5*		*20*	*9*	*3*	***88***	*4*	***567***
of which Support to infrastructures	*1*	*2*	*22*	*2*	*6*	*17*	*1*	*35*		*9*	*1*		*7*	*5*	*35*	***58***			*1*		*1*											*6*		*2*	***10***		***68***
of which Cooperative research																																					
of which Exploratory awards	*6*		*18*	*1*	*31*	*12*	*2*	*36*		*8*	*5*	*3*	*4*	*2*	*28*	***206***			*1*																***1***	*1*	***208***
Fellowships	16	8	60	15	45	62	6	32		47	7	3	2	7	153	**466**																3	1	5	**9**		**475**
Support to networks	24	15	181	19	37	95	12	64		42	9	19	10	23	39	**550**	2		3	2	5	1			8	2	2	4		1		10	14	8	**62**	25	**645**
Concerted actions	1			2				1								**4**		1						1										**2**	2	**8**
Accompanying measures	28	17	76	15	28	15	7	63	2	33	16	13	10	15	76	**513**	3	1	4	1	5	3	2		6	2	2	3				10	8	4	**55**	7	**575**
Total	**398**	**291**	**1 975**	**391**	**734**	**1 597**	**186**	**1 257**	**18**	**684**	**241**	**195**	**369**	**474**	**1 654**	**18 347**	**11**	**13**	**85**	**16**	**73**	**6**	**8**	**2**	**93**	**15**	**26**	**46**	**3**	**16**	**3**	**209**	**278**	**102**	**1 001**	**166**	**11 514**
NUMBER OF PARTICIPATIONS BY TYPE OF ORGANISATION	B	DK	D	EL	E	F	IRL	I	L	NL	A	P	FIN	S	UK	Tot.	BG	CY	CZ	EE	HU	LV	LT	MT	PL	RO	SK	SI	TR	IS	LI	NO	CH	IL	Tot.	Oth.	TOT.
Entreprise sector	109	59	434	116	207	434	29	375	10	185	73	56	74	116	259	**2 859**			2	2		65				15	1	7	11		5	2	53	59	16	**207**	29	**3 095**
Higher education	146	76	589	139	227	247	93	286		253	79	58	82	116	636	**3 179**	1	2	14	7	12	3	1	1	38	9	3	13	2	5		51	107	52	**337**	53	**3 569**
Research centres (including JRC)	95	103	659	107	206	782	39	424	5	265	68	53	91	125	256	**3 225**	6	2	36	5	34	2	4		29	6	14	10	1	1		77	72	16	**329**	67	**3 612**
Others (8)	48	43	173	49	94	154	25	186	3	81	21	34	53	42	153	**1 084**	4	7	14	2	12	1	3	1	8	3	2	5		3	1	28	20	16	**137**	17	**1 238**
Total	**398**	**291**	**1 975**	**391**	**734**	**1 597**	**186**	**1 257**	**18**	**684**	**241**	**195**	**369**	**474**	**1 654**	**18 347**	**11**	**13**	**85**	**16**	**73**	**6**	**8**	**2**	**93**	**15**	**26**	**46**	**3**	**16**	**3**	**209**	**278**	**102**	**1 001**	**166**	**11 514**
of which total number of SMEs	*70*	*49*	*346*	*69*	*113*	*229*	*25*	*286*	*5*	*107*	*50*	*50*	*49*	*85*	*222*	***1 584***			*6*	*2*		*17*		*1*		*35*	*1*	*9*	*21*		*5*		*55*	*43*	*13*	***268***	*23*	***2 103***
of which SMEs of the enterprise sector	*53*	*26*	*208*	*70*	*89*	*164*	*8*	*167*	*1*	*60*	*26*	*31*	*33*	*31*	*169*	***1 063***			*3*	*1*		*9*				*5*	*1*	*5*	*5*		*4*		*19*	*25*	*7*	***105***	*23*	***1 321***

TABLE 7: FP5: CO-OPERATION LINKS IN SHARED-COST CONTRACTS SIGNED UNTIL 31 MARCH 2000 (BUDGET 1999)

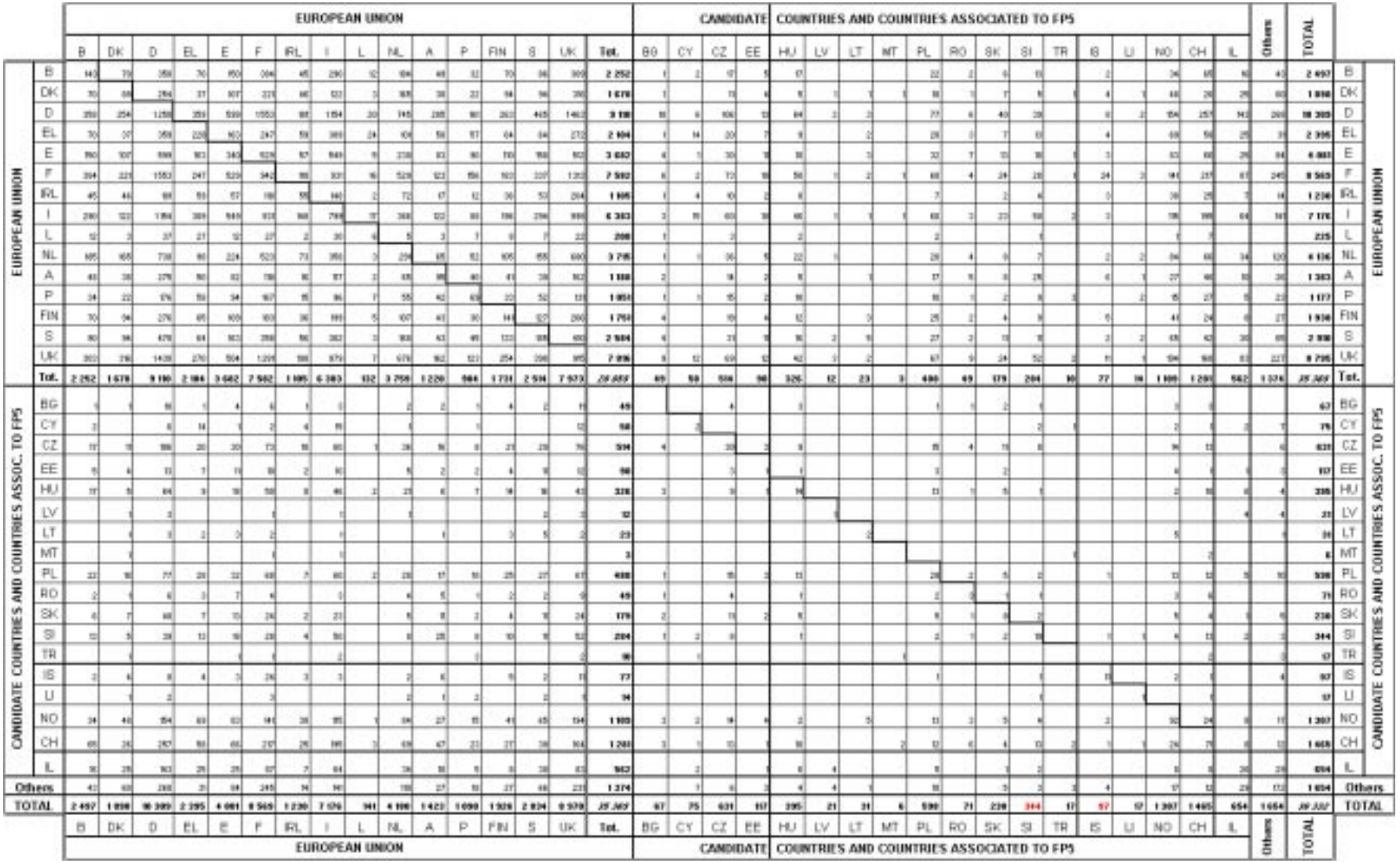

TABLE 8: FP5: FUNDING OF EC FP5 AND EURATOM FP

	Amount 1999-2002 (11)	Budget 1999
Fifth Framework Programme EC + Euratom	14960	3450
Fifth Framework Programme - EC	13700	3140
Quality of life and management of living resources	2413	553
Food, nutrition and health	290	
Control of infectious diseases	300	
The "Cell Factory"	400	
Environment and health	160	
Sustainable agriculture, fisheries and forestry, and integrated development of rural areas including mountain areas	520	
The ageing population and disabilities	190	
RTD activities of a generic nature	483	
Support for research infrastructures	70	
User-friendly information society	3600	857
Systems and services for the citizen	646	
New methods of work and electronic commerce	547	
Multimedia content and tools	564	
Essential technologies and infrastructures	1363	
RTD activities of a generic nature	319	
Support for research infrastructures	161	
Competitive and sustainable growth	2705	646
Innovative products, processes and organisation	731	
Sustainable mobility and intermodality	371	
Land transport and marine technologies	320	
New perspectives for aeronautics	700	
RTD activities of a generic nature	546	
Support for research infrastructures	37	
Energy, environment and sustainable development	2125	446
Environment and sustainable development	1083	223
Sustainable management and quality of water	254	
Global change, climate and biodiversity	301	
Sustainable marine ecosystems	170	
The city of tomorrow and cultural heritage	170	
RTD activities of a generic nature	119	
Support for research infrastructures	69	
Energy	1042	223
Cleaner energy systems, including renewables	479	
Economic and efficient energy for a competitive Europe	547	
RTD activities of a generic nature	16	

	Amount 1999-2002 (11)	Budget 1999
Confirming the international role of Community research	475	78
Cooperation with certain categories of third countries :		
- States in the pre-accession phase	26	
- NIS and CEECs not in the pre-accession phase	112	
- Mediterranean partner countries	55	
- Developing countries	210	
- Emerging economy and industrialised countries	5	
Training of researchers	15	
Coordination	52	
Promotion of innovation and encouragement of SME participation	363	78
Promotion of innovation	119	
Encouraging SME participation	44	
Joint innovation/SME activities	200	
Improving human research potential and the socio-economic knowledge base	1280	293
Supporting training and mobility of researchers	858	
Enhancing access to research infrastructures	182	
Promoting Scientific and technolocial excellence	50	
Improving the socio-economic knowledge base	165	
Support for the development of scientific and technology policies in Europe	25	
Direct Actions (JRC)	739	189
Serving the Citizen	292	
Enhancing Sustainability	321	
Underpinning European Competitiveness	126	
Fifth Framework Programme - Euratom	1260	310
Indirect Actions	979	238,2
Controlled Thermonuclear Fusion	788	207
Nuclear Fission	191	31,2
Key-action : nuclear fission	142	
RTD activities of a generic nature	39	
Support for research infrastructures	10	
Direct Actions (JRC)	281	71,8
Nuclear fission safety	122	
Nuclear safeguards	138	
Decommissioning and waste management	21	

TABLE 9A: COMMUNITY RESEARCH COMMITMENTS: TREND FOR THE PERIOD 1984 - 2002

(ECU and € million, current prices)

Situation au 05.04.2000

ANNEES	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	00 (14)	01 (15)	02 (15)	TOTAUX
PC 1984-87	593,0	735,0	874,0	701,8	260,8	101,1	4,9													3270,6
PC 1987-91				188,1	810,6	1241,3	1596,9	1270,7	230,9	14,8	3,9	0,2								5357,4
PC 1990-94								296,0	2160,5	2079,5	2014,7	1,0								6551,7
PC 1994-98 (12)												2982,5	3153,5	3485,6	3499,3					13120,9
PC 1998-02																3326,7	3630,0	3920,0	4083,3	14960,0
PROGRAMMES DE RDT	593,0	735,0	874,0	889,9	1071,4	1342,4	1601,8	1566,7	2391,4	2094,3	2018,6	2983,7	3153,5	3485,6	3499,3	3326,7	3630,0	3920,0	4083,3	43260,6
APAS				49,4	56,6	69,8	113,1	168,8	308,4	440,2	571,8	2,1								1780,2
RDT+APAS	593,0	735,0	874,0	939,3	1128,0	1412,2	1714,9	1735,5	2699,8	2534,5	2590,4	2985,8	3153,5	3485,6	3499,3	3326,7	3630,0	3920,0	4083,3	45040,8
SPRINT							16,0	16,0	17,0											49,0
CECA							17,5	17,5	17,5	17,5	17,5									87,5
80% de THERMIE							36,0	118,4	128,9	139,2	145,6									568,1
Total Recherche (13)	593,0	735,0	874,0	939,3	1128,0	1412,2	1784,4	1887,4	2863,2	2691,2	2753,5	2985,8	3153,5	3485,6	3499,3	3326,7	3630,0	3920,0	4083,3	45745,4

4269,3 c. à d. 2,42% du Budget

7151 c. à d. 3,18% du Budget

11980 c. à d. 4,05% du Budget

15878 c. à d. 4,02% du Budget

18459 c. à d. 3,94% du Budget

BUDGET CE(prix courants)	28905	29925	35842	38392	43080	42569	45057	56111	61232	67760	65929	75355	82125	85028	86523	95084	91646	95249	100249
Programm. de RDT en % Budget	2,1	2,5	2,4	2,3	2,5	3,2	3,6	2,8	3,9	3,1	3,1	4,0	3,8	4,1	4,0	3,5	4,0	4,1	4,1
Total Recherche en % 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	3,8	4,1	4,0	3,5	4,0	4,1	4,1

Table 9B: Community research commitments: trend for the period 1984 - 2002

(ECU and € million, 1992 prices)

Situation au 05.04.2000

ANNEES	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	0 (14)	01 (15)	02 (15)	TOTAUX
PC 1984-87	980,2	1146,6	1318,3	1024,5	367,3	135,5	6,3													4978,7
PC 1987-91				274,6	1141,7	1663,9	2047,3	1547,7	271,6	17,2	4,4	0,2								6968,6
PC 1990-94								360,5	2541,8	2412,4	2294,6	1,1								7610,4
PC 1994-98 (12)												3354,9	3435,2	3696,3	3648,9					14135,3
PC 1998-02																3394,6	3630,0	3850,7	3933,8	14809,1
PROGRAMMES DE RDT	980,2	1146,6	1318,3	1299,1	1509,0	1799,4	2053,6	1908,2	2813,4	2429,6	2299,0	3356,2	3435,2	3696,3	3648,9	3394,6	3630,0	3850,7	3933,8	48502,1
APAS				72,1	79,7	93,6	145,0	205,6	362,8	510,7	651,3	2,4								2123,2
RDT+APAS	980,2	1146,6	1318,3	1371,2	1588,7	1893,0	2198,6	2113,8	3176,2	2940,3	2950,3	3358,6	3435,2	3696,3	3648,9	3394,6	3630,0	3850,7	3933,8	50625,3
SPRINT							20,5	19,5	20,0											60,0
CECA							22,4	21,3	20,6	20,3	19,9									104,5
80% de THERMIE							46,2	144,2	151,7	161,5	165,8									669,4
Total Recherche (13)	980,2	1146,6	1318,3	1371,2	1588,7	1893,0	2287,7	2298,8	3368,5	3122,1	3136,0	3358,6	3435,2	3696,3	3648,9	3394,6	3630,0	3850,7	3933,8	51459,2

6405 c. à d. 2,41% du Budget

9439 c. à d. 3,15% du Budget

14213 c. à d. 4,04% du Budget

17275 c. à d. 4,02% du Budget

18458 c. à d. 3,94% du Budget

BUDGET CE	47777	46685	54060	56047	60676	57063	57765	68345	72038	78608	75090	84764	89461	90168	90222	97024	91646	93565	96579
Programm. de RDT en % Budget	2,1	2,5	2,4	2,3	2,5	3,2	3,6	2,8	3,9	3,1	3,1	4,0	3,8	4,1	4,0	3,5	4,0	4,1	4,1
Total Recherche en % 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	3,8	4,1	4,0	3,5	4,0	4,1	4,1
Facteurs de deflation (16)	0,605	0,641	0,663	0,685	0,71	0,746	0,78	0,821	0,850	0,862	0,878	0,889	0,918	0,943	0,959	0,98	**1,000**	1,018	1,038
Inflation annuelle en %		6,0	3,5	3,3	3,6	5,1	4,5	5,2	3,5	1,4	1,9	1,3	3,3	2,7	1,7	2,2	2,0	1,8	2,0

Notes

(1) Special measures are attached to either type of financial participation, as appropriate.

(2) Following selection decisions of the Commission.

(3) Not all proposals received have been subject to complete selection procedure during the year, therefore no success rates can be derived from the comparison of proposals received and proposals selected for funding in 1999

(4) All contracts and supplementary contracts signed in 1999 or before with a completion date for research work after 31.1

(4a) Fellowships and support to networks have been added to shared-cost actions for consistency with FP4 categories.

(5) Sum of the total Community contributions for the entire duration of all new projects, as stipulated in the contracts.

(6) All contracts signed over the whole duration of FP4, including those which have already been completed. Except where a specific programme provides otherwise, supplementary contracts (amending a preexisting contract) are not taken int account in the total number of contracts, but their effects are taken into account in the overall number of participations and in the overall Community contribution.

(7) Including the participations of EEIGs and international organisations.

(7a) For the International Role programme, SMEs participating in shared-cost actions only.

(8) Including non-research private non-profit organisations, non-research public organisations and unspecified.

(9) These figures do not include the participations of EEIGs and international organisations nor some individual fellowships

(10) Switzerland (CH) is associated to the EURATOM FP. Association with the FP (CE) is expected to enter into force in 2

(11) Indicative breakdown in italics; subtotals underlined.

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

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

(14) Budget for 2000

(15) Estimates for 2001-2002

(16) The deflation factors used from 1995 take account of the enlargement of the Union from 12 to 15 Member States (COM(96)65). They are estimates from 2001 onwards.

COUNTRY CODES

MEMBER STATES	
B	Belgium
D	Germany
DK	Denmark
EL	Greece
E	Spain
F	France
IRL	Ireland
I	Italy
L	Luxembourg
NL	Netherlands
A	Austria
P	Portugal
FIN	Finland
S	Sweden
UK	United Kingdom
CANDIDATE COUNTRIES AND COUNTRIES ASSOCIATED WITH FP5	
Candidate countries	
BG	Bulgaria
CY	Cyprus
CZ	Czech Republic
EE	Estonia
HU	Hungary
LV	Latvia
LT	Lithuania
MT	Malta
PL	Poland
RO	Romania
SK	Slovakia
SI	Slovenia
TR	Turkey
EEA countries	
IS	Iceland
LI	Liechtenstein
NO	Norway
Other States associated with FP5	
CH	Switzerland (10))
IL	Israel

ANNEX 3

MAIN REPORTS RELATING TO COMMUNITY RESEARCH ACTIVITIES

1. MAIN DOCUMENTS OF RELEVANCE TO COMMUNITY RTD ACTIVITIES PUBLISHED BY THE EUROPEAN COMMISSION

- Five-year Assessment of the European Union Research and Technological Development Programmes, 1995-1999: Report of the Independent Expert Panel chaired by J. Majó, not yet published, available on the CORDIS website (www.cordis.lu/fp5/5yr_reports.htm).

- Five-year Assessments of the Specific Programmes, 1995-1999: Reports of the Independent Expert Panels, available on the CORDIS website (www.cordis.lu/fp5/5yr_reports.htm).

- Annual Monitoring Reports drawn up for the EC and Euratom Framework Programmes and for all the Specific Programmes for 1995, 1996, 1997, 1998 and 1999.

- Joint Research Centre: 1999 Annual Report (COM(2000) 366 final)

- Implementation of the JRC's Mission: Report by ann Independent High-level Panel chaired by Viscount E. Davignon, available on the JRC's website (www.jrc.org).

- Scientific Audit of the JRC Institutes, available on the JRC's website (www.jrc.org).

- Evaluation of the Joint Research Centre 1995-1999, Communication from the Commission (not yet published).

- Second European Report on S&T Indicators 1997, EUR 17639 (1997) and Key figures (2000).

- Research and Development : Annual Statistics 1999 – Eurostat, European Commission (1999).

- R&D and Innovation Statistics for the Candidate Countries and the Russian Federation (Eurostat) .

2. MAIN ANNUAL BUDGETARY DOCUMENTS OF RELEVANCE TO COMMUNITY RTD ACTIVITIES

– General EC Budget for the Financial Year 2000, OJ L 40 (14 February 2000).

– Revenue and Expenditure Account and Balance Sheet, relating to Operations under the 1999 Budget (not yet published).

– The Community Budget: the Facts in Figures, which provides a time series of research payments from the year 1958, SEC(98) 1100.

ANNEX 4

MAIN ACRONYMS AND ABBREVIATIONS USED

ASEM	Asia-Europe Meeting
COST	European Cooperation in the field of Scientific and Technical research
CRAFT	Cooperative Research Action For Technology (technology stimulation measures for SMEs)
CREST	Scientific and Technical Research Committee (advises the Commission)
EU	European Union
EURATOM	European Atomic Energy Community
INCO-DC	Cooperation with third countries and international organisations in the field of RTD (second activity under 4th Framework Programme)
INTAS	International Association for the promotion of cooperation with scientists from the Independent States of the former Soviet Union
JRC	Joint Research Centre
OJ	Official Journal
R&D	Research and Development
RTD	Research and Technological Development
SMEs	Small and Medium-sized Enterprises
S&T	Science and Technology