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Annex to the

**Annual Report on research and technological development activities of the European
Union in 2003**

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TABLE OF CONTENTS

1.	European Support to Research: Activities and Results in 2003.....	3
1.1.	Policy Strategy and coordination	3
1.2.	Indirect support actions	5
1.3.	Direct actions by the Joint Research Centre (JRC).....	12
1.4.	Achievements of previous Framework Programmes and other activities.....	13
1.5.	Research and training actions under the Euratom treaty.....	15
1.6.	Research programme of the research fund for coal and steel	15
2.	Developments in European Union Member States	16
2.1.	The Open Method of Coordination in support of reaching the Barcelona objectives	16
2.2.	Trends in research investment.....	19
3.	International Cooperation Agreements	22
4.	Consultation and Monitoring Procedures.....	24
4.1.	Scientific and Technical Research Committee (CREST)	24
4.2.	Programme Committees	24
4.3.	External Advisory Groups.....	25
4.4.	Monitoring.....	25
4.5.	European Research Advisory Board (EURAB).....	26
5.	Statistical tables on the implementation of the 6 th framework programme	27
5.1.	Explanatory notes.....	27
5.2.	List of tables in the statistical annex	28

1. EUROPEAN SUPPORT TO RESEARCH: ACTIVITIES AND RESULTS IN 2003

1.1. Policy Strategy and coordination

2003 was the first year of the effective **implementation of the sixth Framework Programme**, the key instrument of community research policy. Allocated a budget of 17.5 billion euro over the period 2002-2006, the sixth Framework Programme contributes in a significant way to the realization of the European Research Area. The new Member States have been able to participate in it since its launch due to association agreements. At the end of 2003, some modifications of the Framework Programme were proposed by the Commission to increase its budget in view of the enlargement in 2004.

The 6th Framework Programme introduced two **new instruments**: the Networks of Excellence and the Integrated Projects. These instruments aim at bringing together in strong collaboration the best teams and research institutes in order to constitute critical mass of resources and increase their impact on the structuring and integration of European research.

This **first year of implementation of the Framework Programme** was an overwhelming success in terms of participation and impact of the interventions. Following the first calls for proposals launched at the end of 2002, more than 150 000 participants from more than 50 countries presented around 16000 proposals. All of the thematic priorities were covered by the proposals, which were generally of a very high quality. For the new instruments, the average number of participants (in order of 25 to 30) in proposals and retained projects was higher than that observed in the 5th Framework Programme, and the average financing was also higher (in the order of 10 million euro per project) and that registered in previous framework programmes. The new instruments correspond to around 75% of the available budget of approximately 5 billion euro that was available from the first calls for proposals. The implementation of the 6th Framework Programme was preceded by the adoption by the Commission of the necessary legal framework, including the model contracts and guidelines for evaluation and selection of proposals.

2003 also witnessed the **opening of the thematic priorities of the 6th Framework Programme to the participation of third countries**, with a budget of 285 million euro, as well as access by third country researchers to mobility and training grants. In addition, a general call was published for specific support actions for the then accession countries with the aim of promoting their participation in the 6th Framework Programme and their integration in the European Research Area.

Furthermore, as foreseen in the agreement reached in the specific programme “Integrating and strengthening the European research area”, an **inter-institutional dialogue on stem cells** took place during the year. The report of 3 April 2003¹ provided a base for the discussions in an inter-institutional seminar held on 24 April 2003 in Brussels. Following this, the Commission proposed on 9 July 2003² to modify the specific programme by special conditions for community financing of research activities concerning stem cells from human embryos. On 11 November 2003, the Commission adopted the modalities to follow during evaluation,

¹ SEC(2003)441

² COM(2003)390

selection and financing of projects involving the use of human embryonic stem cells, stored in banks or isolated in culture.³

The **open method of coordination**⁴ in the field of research was progressed by the European Council and Council of ministers in March 2003. With the adoption of the action plan “Investing in Research”,⁵ in response to a request from the Barcelona European Council, new perspectives for European research were opened. The objective is to reach a level of 3% of GDP invested in research and development (of which two thirds to come from the private sector) by 2010. Four axes were specified in the action plan: the coordination of efforts by Member States, including by the creation of European technology platforms; improving the effectiveness of public support to research through actions in areas such as research careers or the interface between public research and businesses; increasing the level of public investment towards research; and promoting a better environment for research and for technological innovation, particularly in the area of protection of intellectual property and competition rules.

A new perspective for the Europe of knowledge was opened up with proposals put forward in a Communication⁶ for strengthening **basic research** in Europe. This Communication raised to a political level the debate on this issue that had been taken place within the scientific community for a number of years. A new mechanism is envisaged to provide further support to basic research at a European level.

The Communication on the **role of universities** in the Europe of knowledge⁷ opened a debate of the range of challenges facing universities, such as the need for excellence, international competition, as well as the role of universities for economic and regional development. This led to the organization of a major conference held in Liege in April 2004.

The Commission launched a three-year **preparatory action for security research** (2004-06). This followed a Commission Communication on a European Union policy for defence equipment,⁸ and aims to prepare the ground for a full European Programme to promote security through research and technological developments (ESRP) from 2007 onwards. A further Commission Communication is planned on the creation of a European Security Research Advisory Board to advise on the content and implementation of the Programme and to establish user needs and encourage cooperation between Member States. For the longer term, the works of ESRAB could eventually evolve towards the preparation of a long term vision and strategic agenda for security research.

A progress report of 5 March 2003⁹ on implementing the **European strategy for life sciences and biotechnology**, responding to a request from the Barcelona European Council, presented the current progress and future actions in this area.

³ C(2003)2952/4

⁴ The Open Method of Coordination is an intergovernmental coordination tool that is applied to areas where the Community does not have competencies defined by the Treaties. The principles of the Open Method of Coordination were established at the Lisbon Council in 2000.

⁵ COM(2003)226

⁶ COM(2004)9

⁷ COM(2003)58

⁸ COM(2003)113

⁹ COM(2003)96

Regarding the regional dimension of the European Research Area, the research directorate general of the Commission designed and implemented the “**Regions of Knowledge**” **pilot action**, initiated by the European Parliament for 2003, with a budget of 2.5 million euro. The aim is to develop experimental actions involving networks of European regions, to provide models for the regional implementation of the Lisbon strategy. Project implementation is considered as part of the overall objective of setting up a Mutual Learning Platform for the Regions in the context of the 3% Barcelona objective. A significant part of the projects is devoted to Regional Foresight. Following a call for proposals published on 1 August 2003, 14 projects are being financed. The action is being progressed in coherence with the network of Innovative Regions of Europe. In addition, the first phase of the work on the Bonus scheme enabling successful applicants to the Framework Programme coming from Objective 1 regions to claim additional financing from the Structural Funds has been finalised.

The **international dimension of the European Research Area** was strengthened with a number of bilateral agreements. The proposals for negotiations of a scientific and technical cooperation agreement with Egypt, and agreements concluded with Morocco, Tunisia and Israel,¹⁰ open up new perspectives for Mediterranean partnerships. Proposals to open negotiations with Japan¹¹ and agreements signed with Switzerland, Mexico and Brazil and that concluded with Chili,¹² as well as the renewal of agreements with the United States, Russia and the Ukraine,¹³ underline the breadth and diversity of international exchanges (see Section 4 for further details).

1.2. Indirect support actions

1.2.1. Genomics and biotechnology for health

Poverty related diseases were a particular point of focus during 2003. In order to develop new clinical treatments to fight against HIV/AIDS, malaria and tuberculosis, the European Parliament and Council adopted on the 16 June 2003 a decision concerning the participation of the European Community in a long term partnership between Europe (the EU and Norway) and developing countries.¹⁴ Allocated a budget of a maximum of 600 million euros, of 200 million from the European Community, this project is the **first application of Article 169** of the Treaty, which foresees the participation in research programmes jointly undertaken by Member States.

In order to create a **European Area for Brain Research**, the Research DG organised in September 2003, in collaboration with the European Parliament, a conference titled “Brain Research in Europe: Structuring European Neurosciences.” The problem of antibacterial resistance linked to human health from the perspective of basic and clinical research was also the object of a European conference, “Combating Antibiotic Resistance” in November 2003.

Following the first **calls for proposals** of the 6th Framework Programme, over 200 propositions have been selected, covering most of the subjects in the work programme. Nearly 80% of the available budget has been committed to Networks of Excellence and to Integrated Projects.

¹⁰ SEC(2003)286, COM(2003)551, COM(2003)549 and COM(2003)568 respectively

¹¹ SEC(2003)540

¹² COM(2003)656, COM(2003)438, COM(2003)381 and COM(2003)82 respectively

¹³ COM(2003)569, COM(2003)95 and COM(2003)231 respectively

¹⁴ Decision number 1209/2003/EC

1.2.2. Information society technologies

The key role of Information Society Technologies (IST) in improving competitiveness and growth and in addressing the major societal challenges has been confirmed by recent European and international studies¹⁵. IST research in the 6th Framework Programme helps Europe master these technologies, shape their development and make the best use of their applications in all sectors of the economy and society. Community support to research in IST is one of the three pillars of Community policy actions for the Information Society in addition to the eEurope initiative and the regulatory framework for the Information Society. In the context of the eEurope 2005 mid term review, the Commission has initiated a political debate on a renewed strategy for the mastering and uptake of IST.

Two **calls for proposals** for the IST priority in the 6th Framework Programme have been evaluated in 2003 covering all areas of the IST Work Programme for 2003-2004. These have attracted over 2500 proposals covering essential technology components and their integration into various application contexts. Out of these, around 400 proposals were selected for funding. The selected proposals will receive total Community funding of around 1.7 B€. This in turn will mobilise about 1 B€ of private sector spending. The selected proposals bring together more than 5000 partners from industry and academia from across Europe. Industry will receive around 45% of the funding and 16.5 % of the funding will go to SMEs.

Building on Europe's strengths in areas such as mobile and wireless systems, micro and nano-electronics, services, industrial systems and embedded systems, the selected projects will not only reinforce Europe's leadership in these fields but will also improve the competitiveness of all major economic sectors. Projects address in particular the sectors that are increasingly ICT-dependent including manufacturing, automotive, aerospace, pharmaceuticals, medical equipment, agro-food, as well as financial services, media and retail. The projects aim to bring technology closer to people needs and address key societal challenges from health, to security, safety and environment. Activities relating to IMS, a multilateral RTD cooperation framework between major industrialised countries were supported by a call for proposals. A number of projects were launched in the Future and Emerging Technologies open scheme in the IST thematic priority.

In order to make sure that research priorities respond to industrial and citizen needs and to ensure a better coordination of the research effort with and between the member states, three pilot **European Technology Platforms** were launched in IST by the industrial and research Community. With the Commission acting as facilitator, these Platforms cover the areas of Nano-electronics, Mobile Communications and Embedded systems. They aim at developing common visions and roadmaps for research in these fields between all key industrial and academic research actors and help pool the necessary private and public resources to implement these roadmaps.

Major policy developments relating to IST research include Commission communications on the role of eGovernment, on safe and intelligent vehicles, and on digital broadcasting and electronic communications, as well as a Directive on eMoney. Significant dissemination events include ministerial conferences on eHealth and eGovernment.

¹⁵ "The Policy Agenda for Growth" and "The Sources of Economic Growth in OECD Countries", OECD, 2003

1.2.3. *Nanotechnology, intelligent materials, new production processes and devices*

Research in this new priority concerns nanotechnology and nanosciences, and knowledge based multifunctional materials and production devices integrating multifunctionality, intelligence and autonomy. They offer an enormous potential for many industrial sectors. Using an integrated and multidisciplinary approach, based on strong partnerships between universities and industry, long term research projects were financed throughout 2003 to stimulate the introduction of these emerging technologies and contribute to the modernization of European industry. Several communication actions were launched to emphasize the huge possibilities in this new area.

To support **European manufacturing industry**, a high level group was created to develop a long term vision in the context of sustainable development and globalization. A first Commission reflection document on a “Manufacturing Technology Action Plan” was welcomed during a conference in Milan in December 2003, which brought together representatives of industry, academia and government.

In addition, a common and integrated **strategy for the future of research on nanotechnology** in an enlarged Europe was the subject of a discussion forum during a conference in Trieste in December 2003. On this basis, a Communication was prepared to promote political level debate on nanotechnology, its potential impact in many areas, and the opportunities and challenges to ensure that it leads to a better future for Europe.

A large number of projects are being financed following the first **call for proposals**. One example is the NAIMO integrated project which is undertaking a wide programme of basic and applied research with the aim of creating a new industry of organic electronics. Following a call for proposals for traditional industries, a number of projects are being supported, mostly on research at the frontier of current knowledge.

1.2.4. *Aeronautics and space*

The Commission launched a consultation process and debate on the **future of Europe in the field of Space** by adopting a Green Paper of 21 January 2003,¹⁶ with the aim of strengthening the contribution of space research to European policies and quality of life. The Paper was welcomed by the European Council and Parliament and the Economic and Social Committee. Following this, a White Paper was adopted on 11 November 2003.¹⁷ The Commission emphasised the necessity of Europe’s independent access to Space, the development of Space technologies, the promotion of Space exploration, attracting young people to scientific careers and strengthening European excellence in Space science. A Framework Agreement between the European Commission and the European Space Agency (ESA) was signed on 25 November 2003 to facilitate joint activities and to overcome the difference between the Community approach and the intergovernmental approach inherent to the structure of ESA.

The **GMES initiative**, which aims to provide the European Union with an independent capacity for global monitoring, represents the second most important initiative launched in collaboration with ESA. Its initial phase was completed and a Commission Communication evaluated the lessons learned so far and set out the strategy for launching the next phases. In view of strengthening international cooperation in the field of global monitoring for

¹⁶ COM(2003)17

¹⁷ COM(2003)673

sustainable development, a first Summit of Earth Observation in July 2003 in Washington, brought 34 countries together and the European Commission. At the end of the Summit, a joint declaration was issued, an objective to prepare a 10-year plan before the end of 2004 was fixed, and an ad-hoc group on Earth observation was established.

Following the first **calls for proposals** in the fields of aeronautics and of space, one network of excellence was established in each field, and a number of integrated projects were financed.

ACARE (the Advisory Council for Aeronautics Research in Europe), the first experience of a technology platforms, which was launched on June 2001, carried out extensive work during 2003 and the first trimester of 2004, particularly in preparing the second edition of the Strategic Research Agenda. ACARE was also involved in the monitoring of the implementation of the first Strategic Research Agenda by all stakeholders, the analysis of the capabilities in the Member States with less developed aeronautical industry, the economic impact of air transportation in the European economy, a common European taxonomy for aeronautical RTD, the analysis of possible air transport scenarios, and the analysis of aeronautical education schemes in European universities and possibilities for improvement.

1.2.5. Food quality and safety

In the March 2003 progress report on the **European strategy for lifesciences and biotechnology**, issues were raised concerning research, competitiveness, innovation and intellectual property, as well as genetically modified organisms (GMOs), the relationship between science and society, and the international dimension. The theme of food quality and safety is an important part of the Commission strategy, and an initiative was launched in June 2003 foreseeing the development of an action plan for 2004-2010 for the environment and health.

2003 witnessed the results of a colloquium on **quality assurance and genetic testing**, organized jointly with the OECD, which lead to a major publication and a catalogue of projects on genetic testing. These links should allow an appropriate balance between the interests of patients and society and those of the emerging industry and genetic technologies.

Following the first **call for proposals** a number of projects have been financed, including two integrated projects. One of these is on quality and safety in the food chain, the other focuses on the interaction between the genome and nutrition in metabolism. A second call, specifically targeted at support actions for the then accession countries, closed in June 2003 and three projects retained for financing.

1.2.6. Sustainable development, global change and ecosystems

The contribution of research was decisive in many **Commission policy initiatives**, such as the Strategy for Sustainable Development, the Environmental Technology Action Plan and the Directive on a trading system for quotas for emissions of greenhouse gases. The Commission also participated in numerous major international events having implications in research matters, such as the Biodiversity strategy, the Global Forum on Water, the Intergovernmental Panel on Climate Change, and the Action Plan of the G8 on Science and Technology for Sustainable Development, the International Partnership for the Hydrogen Economy and the Carbon Sequestration Leadership Forum, the Johannesburg Renewable

Energy coalition, the United Nations Framework Convention on Climate Change (Kyoto), the United Nations Economic Commission for Europe and the International Energy Agency.

In the field of energy, the **European strategy for hydrogen and fuel cells** progressed with the launch of a technology platform, following the recommendations of a “Vision Report” by a high level group. A similar process was followed for photovoltaics. Furthermore, first steps have been taken for the creation of a Biofuels for Transport Technology Platform. With regard to **surface transport**, a Technology Platform for Road Transport was also launched (ERTRAC – European Road Transport Advisory Council), while the platform for **rail transport** (ERRAC – European Rail Research Advisory Council) continued its strategic agenda and the Maritime Industry Forum (MIF) furthered its efforts in **maritime transport**.

Following the **first call for proposals on global change and ecosystems** a number of Integrated Projects and Networks of Excellence were established in areas of global change, water, natural disasters, ecosystems and biodiversity. Several projects will also lead to strengthened support for Community policies, in particular those concerning the evaluation of the environmental and economic impacts of policies and technologies. **In energy research, the first call for proposals** lead to projects, including Integrated Projects and Networks of Excellence, relevant to renewable energy, in particular biomass and PV, new energy carriers such as hydrogen and electricity, fuel cells and carbon dioxide capture and storage. Among the major themes of the **first call in the area of surface transport**, are environmental aspects of road haulage, the competitiveness of the shipping industry as well as inter-operability and building capacity in rail transport. A second call was launched in this area at the end of 2003.

1.2.7. Citizens and governance in the knowledge society

Concerning new instruments, the emerging themes relate to new modes of governance, freedom and security in Europe in the context of a constantly changing environment, research and innovation policies for the construction of the European Research Area, as well as aspects of migration, international integration and social cohesion. Additional efforts were also made for a better integration of social sciences and humanities in the European Research Area with a particular objective of a better articulation of national and European programmes.

Following the first **call for proposals** over 40 projects were selected for funding. One of the Integrated Projects brings together 40 experts in political science, sociology, economics and international relations, coming from 13 European countries; it will study the links between internal security and foreign security in Europe and will establish an observatory to promote security and freedom. For the second call, a greater mobilisation of researchers was evident. The call included for the first time an important element of humanities and subjects such as European history and the European identity.

1.2.8. Specific measures covering a wider field of research

Scientific support to policy is an activity introduced in the 6th Framework Programme to provide support to Community policies in areas such as agriculture, fisheries, environment, health, justice, home affairs, security, internal market, competitiveness, employment, education, culture, energy, transport, regional development, external relations, etc. A first call for new approach of Scientific Support to Policy closed on 13 March 2003 with over 80 proposals retained for funding. A second call was published on 3 July in response to the SARS epidemic with a deadline of 30 September 2003, with 7 proposals being negotiated. The third call closed on 13 January 2004, with an indicative budget of €83.1 million.

For the **anticipation of scientific and technological needs**, 2003 saw the launch of NEST (New and Emerging Science and Technology), which aims to support visionary research and open up new horizons for science and technology and address emerging questions. The first call was published on 27 February 2003, with 13 projects being funded.

In addition to the participation of SMEs across the whole Framework Programme, in particular in the Priority Thematic Areas, the **Horizontal Research Activities involving SMEs** offer two schemes allowing innovative SMEs with limited research capabilities to outsource their research needs to RTD performers, while retaining the ownership of IPR. Calls for proposals under both schemes have experienced high response rates. The first call for Co-operative research received 652 eligible proposals involving around 3,500 SMEs. From these proposals 121 were retained for funding. This call also had a second deadline in 2003 and received 968 eligible proposals of which 86 were retained for funding. The first call for Collective research, a new scheme based on a 5th Framework Programme pilot action allowing SME associations and groupings to outsource their research needs to RTD performers, gave rise to 117 eligible proposals of which 22 were selected for funding. An internal Commission task force has been set up to monitor SME participation in the Priority Thematic Areas and the progress towards the 15% participation target and to identify concrete measures that could be implemented to foster SME participation based on good practices.

Concerning **specific support measures for international cooperation**, support actions were launched for Mediterranean countries, the Balkans, developing countries, and for Russia and the Newly Independent States. The call for specific targets research projects received strong participation in all the areas covered (environment, agriculture, health).

1.2.9. Strengthening the bases of the European Research Area

The new **ERA-NET initiative**, aiming at networking and opening up national and regional research programmes, was a success. Over 70 proposals were received under the first call closing on 3 June 2003 and over 30 proposals funded.

The Commission continued its support for the **European Cooperation for Scientific and Technological research** (COST). A contract was signed on 26 August 2003 with the European Science Foundation, the organisation designated by COST to provide from there on its secretariat.

Concerning the **benchmarking of national research and innovation policies**, some progress was achieved with the publication of five reports on: human resources, public and private investments, the impact of research on competitiveness and employment, scientific and technological productivity, and the promotion of a scientific culture. **The European Innovation Scoreboard and the Trend Chart on Innovation** in Europe are in an expansion phase both as regards sectoral analysis and insights into innovation policies of other world regions, such as Asia and NAFTA. In the area of comparative research policies and the improvement of the administrative environment for research in Europe, a feasibility study was launched with the European Investment Fund to promote cooperation between centres of excellence in risk capital for start ups. The first series of **innovation policy studies** under the 6th Framework Programme was successfully launched, including studies on innovation clusters in the new Member States, governance, public procurement and organisational innovation.

The **pilot exercise on mapping of excellence** undertaken in the areas of biosciences, nanotechnology and economics demonstrated the complexity of mapping excellence and the limits of the exercise. A report presented the principal conclusions and established the next steps.

1.2.10. Structuring the European Research Area

A number of activities were supported in the area of **research and innovation**. The PAXIS activity, which helps innovative small companies to set up and develop, was fully implemented in 2003 including awareness raising activities in over 40 cities. The PAXIS II contracts were successfully negotiated. The networks established under the Gate2Growth initiative grew well during the year and the European database of investment opportunities in innovating companies continued to expand in spite of the difficult market conditions for early stage technology investment.

In 2003 the Commission continued to support the **Innovation Relay Centres (IRC)** as well as their cooperation with other business oriented networks, EUREKA and the ESA. A call for proposals for the FP6 IRC phase (2004-2008) was published in March 2003. The work of the IRC-Innovating Regions of Europe Central Unit continued; a two calls for tenders (for splitting the service into two secretariats for the respective networks) were published in June 2003. A call on Regional Innovation Policies including new tools and approaches was launched in March 2004. Among the FP5 activities of the Innovating Regions in Europe (IRE) network continued in 2003 and early 2004 were projects on the implementation of the Regional Innovation Schemes in 16 regions in 10 candidate countries, and the completion of the work of the 14 Thematic Networks

In the area of **Economic and Technological Intelligence** a call was launched targeting the participation of SMEs and SME groupings in the 6th Framework Programmed and in particular in Integrated Projects. This call received 107 eligible proposals; initially 20 were retained for funding. A call for proposals for the **IPR-Helpdesk** (2005-2007) was launched in March 2004, which is expected to focus on a fast-reply helpline, in particular for SMEs, a range of topic documents.

In view of the objective of the European Research Area of **developing human resources for research**, the Commission adopted on 18 July 2003¹⁸ a Communication entitled “Researchers in the ERA: one profession, multiple careers”. This Communication proposes the opening of a structured dialogue between the various actors and suggests to launch specific actions, such as the development of a **European charter** and a **code of conduct for the recruitment of researchers**, with the aim of reaching a better overall coordination of efforts for the recognition of the profession and concerned careers as well as to establish a European labour market in this field. The approach of the Commission received a favourable reception from the Council on 10 November 2003¹⁹. Furthermore, significant progress was made regarding the removal of legal and administrative obstacles to the mobility of researchers with for example the launching of the **Researcher’s Mobility Portal** - offering information for researchers on job opportunities, financial support schemes as well as practical and

¹⁸ COM(2003) 436

¹⁹ JO C 282 du 25.11.2003 et Bull. 11-2003, point 1.3.63.

administrative information -and as presented in the second implementation report²⁰ on “A mobility strategy for the ERA”.

As regards the financial instrument, with the same view of making Europe as a whole more attractive for researchers through better career perspectives, **the Marie Curie actions** provide a coherent framework addressing research training and mobility at all stages of researchers careers in both academia and industry, with a strong emphasis on transfer of knowledge and the benefits of international mobility. These European actions contribute significantly to the emergence of a genuine European labour market for researchers, to the structuring throughout Europe-25 of research training and career development capacities of research organisations and through national and international research funding schemes and to thereby improve, quantitatively and qualitatively, the overall research capacity in Europe against the background of the need for a substantial number of additional researchers. The Marie Curie Actions were a major success with around 5000 proposals received in 2003 with a success rate of around 20%. In 2004, these numbers strongly increased with a total of 7200 proposals received and a success rate of 13%. It was also noticeable that the rate of participation in the reintegration projects increased strongly in 2003.

The **European Strategic Forum for Research Infrastructures** (ESFRI) continued its activities, with the objective of developing a strategic approach and coherent policy to facilitate multilateral initiatives, and the development, creation and utilization of European research infrastructures. ESFRI's first annual report was published in September 2003 demonstrating the constructive work of several groups already in operation. The need to reinforce the role of the Forum was highlighted during a conference on research infrastructures held in Trieste in November 2003.

The development of **electronic infrastructures** continued, including an increase in the transmission capacity of the GEANT network of research and education communities underpinned by a new Internet Protocol (IPv6), as well as support for GRIDS architectures through projects (e.g. the European DataGrid project, DataTAG and others). The first **call for proposals for research infrastructures**, concerning transnational access, led to a number of projects being funded. A second call, concerning the construction of new infrastructures and accompanying measures, was published in November 2003. Two calls for proposals on GEANT and GRIDS were launched with funding available of 140 million euro.

The implementation of the **action plan “Science and Society”** which covers 39 actions, progressed and three actions were completed in 2003 (Women and industry, women and enlargement, and research and foresight). Following a call for proposals, numerous proposals were received, included 33 concerning European science week. For the René Descartes prize, two winners were named in a ceremony that received good coverage in the media. A number of **calls for proposals** were launched: in the field of research ethics, 7 proposals were selected of the 16 received; for the European initiative for science education, 36 proposals were received; and following a call for proposals for a European platform for women scientists, 21 proposals were submitted.

²⁰ SEC(2004) 412

1.3. Direct actions by the Joint Research Centre (JRC)

In 2003, the JRC consolidated its role as a research-based policy support organisation. The new JRC Multi-Annual Work Programme for the Sixth Framework Programme, adopted in March 2003, reflects the emphasis which JRC places on customers and users, whilst also allowing the development of new scientific competences in order to meet emerging needs. The 2003 JRC Annual Report²¹ contains an overview of its activities, of which the following achievements can be noted.

In the **food and chemicals area**, the JRC provided valuable support to the new chemicals policy, particularly with reference to the registration, evaluation, authorisation and restrictions on chemicals. JRC's expertise in this field will facilitate the establishment of the new European Chemicals Authority in Helsinki. The JRC was designated Community Reference Laboratory for GMO food and feed legislation and is actively engaged in leading the European Network of GMO Laboratories (ENGL). Food safety support saw the launch of a first inter-laboratory comparison for determining acrylamide in food, a successful proficiency test for detecting animal constituents in meat and bone meal – important for controlling the spread of Transmissible Spongiform Encephalopathies (TSEs), and the production of a new isotopic reference material for determining mercury in tuna fish.

The JRC also demonstrated its ability to respond rapidly and professionally to **crisis situations**. This included satellite data support to France and Portugal during the summer 2003 forest fires. In Portugal alone, over 379,000 ha of land were burned. Up to then, fire risk calculations were performed at local/national level but now, together with DG ENV, the JRC has established a coherent reporting system called the European Forest Fire Information System. On a similar plane, the JRC used its advanced crop yield forecasting system to predict the effects of the drought on the year's EU harvest yield – an important prerequisite for agricultural planning and decision making.

In **support to energy policies**, the JRC studied innovative hydrogen storage technologies for road transport with special focus on harmonising test methods and safety standards. The installation of specific test facilities for hydrogen storage commenced.

Environmental support work included vehicle emissions measurements at the JRC's European Reference Laboratory for Air Pollution and the production, with partner organisations, of European and global reference data sets such as the global land cover map and the European soil database.

In 2003, **support to enlargement** of the European Union continued to focus on integration, training and the uptake of the "acquis communautaire"- the body of EU legislation that the New Member States must implement. 72 workshops and 15 information events were organised and JRC reported over 70% inclusion of New Member States in all FP6 proposals.

Last, but not least, the JRC evaluated and granted **excellence awards** to its top young scientists – stressing the importance it accords to research training.

1.4. Achievements of previous Framework Programmes and other activities

1.4.1 Previous Framework Programmes

The continuation, achievement and evaluation of actions and projects started under previous framework programmes was progressed and the Commission ensured the scientific, technical,

²¹ COM(2004)362

legal and financial monitoring of projects. The scientific and technical results and the socio-economic impacts of completed research actions was demonstrated through a large number of high level publications as well as numerous conferences and dissemination workshops.

The opportunities offered by the “Host Organisation” across Europe continued to be available in the context of Marie Curie grants and research training networks. Throughout 2003, more than 200 researchers per month were recruited for the posts vacant.

In 2003, 1019 contracts under the **5th Framework Programme** were closed and 10028 contracts were still underway as of 31 December 2003. For the closed contracts, the “Technology Implementation Plans” and final reports were approved. Some 6277 payments were processed in the year under the 5th Framework Programme.

1.4.2 Evaluation activities

A significant amount of evaluation work was either completed or in progress during the year. This included strategic level exercises as well as evaluations at the level of research activities.

Preparations for the **Five-year Assessment** (1999-2003) of the Framework Programme included preparation of the mandate, identification of experts for the Panel and further expertise to be used and development of supporting studies and other analyses. In this regard an evaluation of Technological Implementation Plans (TIPs) and an impact evaluation of the 3rd and 4th Framework Programmes were completed; and preparations were made for an evaluation of High Impact research activities under the 3rd, 4th and 5th Framework Programmes, an impact evaluation of research under 5th Framework Programme and a bibliometrics study of research under the 3rd and 4th Framework Programmes. Further supporting analyses planned include an analysis of Europe’s changing research landscape and a synthesis study of all Community research evaluation work undertaken during the period covered by the Five-year Assessment.

Six **evaluations of research activities** were completed in the areas of industrial technologies and materials, international cooperation, SMEs, lifesciences, non-nuclear energy, and support for policies²²; and two other evaluations started²³. In addition, two major evaluations were launched in the Information Society Technologies area.²⁴

Overall, the evaluations confirmed that Community research activities have provided very major contributions to Europe’s scientific and technological knowledge base, creating

²² an evaluation of the impact of projects finished under the Industrial Materials and Technologies (IMT) programmes, the Measurement and Testing/Standards, Measurements and Testing (SMT) programmes and the Transport programmes; impact assessment of the EU-US S&T agreement; an intermediate evaluation on project-completion monitoring of SME RTD projects; an assessment of the industrial impact and commercial success of the AIR programme in the area of biomaterials and green chemicals (non-food); an impact assessment of projects under the Framework Programme 4 non-nuclear energy programme; a mid-term assessment of the sub-action ‘Support for the Development of Science and Technology Policies in Europe’, the latter of which was both started and finished during the during the course of the year.

²³ an impact assessment of Marie Curie Fellowships; and an impact assessment of the EU-China S&T Co-operation agreement

²⁴ an assessment of the use of FP6 instruments in IST to order to develop a set of Key Performance Indicators (KPIs) in support of the IST monitoring, evaluation and impact assessments; and an assessment of European IST patterns of research collaboration and integration across the European Research Area

extensive networking and collaborations between and amongst European researchers in the private and public sectors and with significant European Value Added.

1.5. Research and training actions under the Euratom treaty

Under the 6th Framework Programme of the European Atomic Energy Community (Euratom) projects were selected following two **calls in the area of nuclear fission** which covered all the priorities defined: management of radioactive waste, protection against radiation and other activities in the field of nuclear technologies and safety.

In the area of **fusion** energy research priority was given to R&D activities and the negotiations in relation to the joint implementation of the international fusion energy research project **ITER** (International Thermonuclear Experimental Reactor), as well as to specific co-ordinated activities in the fields of fusion physics and technology, new concepts for fusion devices, socio-economic studies and public information. The scientific exploitation of the JET (Joint European Taurus) facilities continued in the framework of the European Fusion Development Agreement (EFDA) which presently runs until 2006. On 27 March 2003, the Commission proposed some changes²⁵ to the voting rights of the consultative committee of the “fusion” programme that was instituted in the Council Decision of 16 December 1980²⁶. Following the Commission Communication of 28 April 2003²⁷, the Council selected the Cadarache site in France as the European candidate site for the construction of ITER, after which the European site proposal was transmitted to the international ITER Negotiators. The 21 fusion Contracts of Association, under which fusion R&D is carried out in the Member States, were extended until the end of 2005. Also, negotiations of a specific cooperation agreement were pursued between Euratom and the Republic of Korea.

The actions of the Joint Research Centre (JRC) included promoting the safety of Eastern European nuclear reactors, where the JRC provided analysis of reactor vessel data, launched a new project to provide safety support to Russian and Ukrainian nuclear power operators and helped organise training workshops on neutron embrittlement and nuclear safety.

1.6. Research programme of the research fund for coal and steel

With the expiry of the CECA Treaty on 23 July 2002, the research programme of the Coal and Steel fund was adopted by the Council on 1 February 2003. A Committee for the coal and steel research fund (COSCO) as well as two consultative committees were subsequently put in place.

Following the **first call**, 116 proposals were received of which 40 were for coal research and 76 in for steel research. Following the evaluation, 60 proposals were retained for a financing of 60 million euro (of which 11 coal and 49 steel). 60 contracts were signed in 2003. The second call led to 178 proposals, of which 144 for steel and 34 for coal.

Apart from the implementation of the research programme, activities focused on technical, financial and budgetary management as well as the monitoring of 320 research contracts CECA pre-existing at the start of the Funds.

²⁵ Com(2003)149 and Bull. 3-2003, point 1.3.79

²⁶ Fourteenth general report, no. 487

²⁷ COM(2003)215 and Bull. 4-2003, point 1.3.47

2. DEVELOPMENTS IN EUROPEAN UNION MEMBER STATES

2.1. The Open Method of Coordination in support of reaching the Barcelona objectives

2.1.1. Background

At the Lisbon European Council in 2000, Europe set itself the goal of becoming the most competitive and dynamic knowledge-based economy in the world. As the main driving force behind the creation of new knowledge, boosting public and private investment in R&D was recognised as pivotal to the Lisbon strategy. In recognition of this, the Barcelona European Council of 2002 called for the EU's overall research investment level as a percentage of GDP (R&D intensity) to reach 3 % by 2010, of which two-thirds should be funded by the private sector. In April 2003 the Commission set out the 3% Action Plan²⁸ in support of this objective. Most Member States have since adopted national targets to raise R&D investment in line with the Barcelona objective.

The application of the Open Method of Coordination for research policies was proposed by the Competitiveness Council of March 2003. Five areas of application were selected in the first instance: the 3% objective, human resources and researchers' mobility, science and society, networking and mutual opening of national and joint RTD programmes and infrastructures of European interest. The Spring European Council of 2003 subsequently endorsed the application of the Open Method of Coordination to research policies and specifically to the 3% objective and to human resources.

2.1.2. The first cycle of the Open Method of Coordination for the 3% objective

In 3% Action Plan identified 25 actions where OMC could be applied and for which the main competences lie in MS. The Competitiveness Council in September 2003 concluded that Committee for Scientific and Technical Research (CREST) would be the interface to put in practice and oversee the OMC 3% initiatives. The CREST regrouped the 25 Actions in different themes and created 5 Expert Groups (EGs) to deal with them: public research spending and policy mixes; public research base and its links to industry; fiscal measures and research; Intellectual Property and research; and SME's and research. The aspects of the five 3% actions related to Human Resources (see also Section 1.2.10) were taken up by the existing Steering Group on Human Resources and Mobility (SGHRM) which also reported to CREST. The following general trends in Member States were amongst others reported by the CREST expert groups:

Public research spending and policy mixes. An impressive set of measures and strategies to promote research and development and innovation is developed by the Member States but only in a few cases the measures are they components of a comprehensive strategy. The measures show, however, broad endorsement of the target to raise R&D expenditure in the EU to 3% of GDP. Whereas the most quoted driver of policy is the improvement of economic performance and competitiveness there is a lack of adequate resources to address research investment needs, both in the public and private sectors. Without exception, the responsibility for the implementation of the measures is distributed between different ministries, making it difficult to have an overview of the budgetary implications. Typically, budget negotiations

²⁸ *Investing in Research: An Action Plan for Europe – COM(2003) 226*

between ministries cover only part of the measures affecting R&D and Innovation. There is little indication of systematic programme evaluation and the results of studies on the possible impact of R&D on future competitiveness, growth and employment are rarely taken into account. Whereas several countries put forward their National Development Plans as a framework for measures to stimulate R&D and Innovation, limited consideration is given to the balance between EU and national funding.

Public research base and its links to industry. There has been a growing awareness within Member States that public funded research has to be better oriented to the needs of the new ‘knowledge-based’ economy. Substantial reorganisation of Public Research Institutions and Higher Education Institutions in Member States has occurred or is ongoing. The remit, organisation, structure and financing of higher education have recently undergone considerable change within most Member States. This has been accompanied by policies to increase the scale and diversity of industry-academic links. As well as reforming the public research base to stimulate the valorisation of research results, often involving the formation of new enterprises, Member States have also recognised that more and better links between research organisations in the public and private sectors have to be created as is illustrated by the large number of schemes in place. There are, however, only a few specific schemes to get private sector firms more interested in the possibilities of the benefits of undertaking R&D. This remains a significant barrier in most schemes and initiatives. Important exceptions are the national, regional and sectoral foresight programmes that have formally sought to include industry participation. In this sense, most countries that now have foresight programmes do have their research and innovation policies to some extent influenced by industry.

Fiscal measures and research. Fiscal measures are becoming an increasingly significant element of the overall policy mix to boost private R&D and major fiscal initiatives are being introduced or extended in many Member States. Although they must be considered as forgone revenues rather than public research funding, fiscal and other indirect measures are equivalent to a significant percentage of the total EU 25 public funding of R&D, although with significant differences from country to country.

Intellectual property and research. Both legislation and key policies in the field of Intellectual Property Rights (IPR) are in continuous change in Member States and therefore difficult to analyse and compare. For example, a large number of Member States have made, or are intending to make, major changes to their national policy to improve the coherence and effectiveness of IPR ownership regimes applicable in publicly funded research. National initiatives mostly do not take into account the “macro” issues that need to be considered such as the Community patent; the grace period; software patenting and State Aid and the valuation of IPR transfer within national systems. There is a growing trend in Member States towards Public Research Organisation ownership of IPR as opposed to professor privilege which still exists in some Member States. The national rules governing ownership of, disclosure of and compensation/sharing of IPR generated by universities and other Public Research Organisations are unclear in some countries and there is little consistency between countries. This lack of uniformity does not facilitate R&D collaborations or technology transfer activities between organisations subject to different regimes, in the same country or in different countries. In many Member States there is no earmarked funding for technology transfer activities; most only promote the management of Intellectual Property rights through awareness-raising mechanisms. A few Member States have introduced methods to promote IPR management within Public Research Organisations by linking them to funding. In this perspective, four important European associations (EUA, EARTO, EIRMA and ProTon) have

grouped together and are in the process of creating European guidelines for the management and exploitation. Some Member States already have national guidelines on the same topic and these European guidelines aim to build on them.

SME's and research. Governments have already started to redesign SME policies in the context of a coherent and integrated approach to economic growth and social development. Some Member States have redesigned and streamlined their innovation policies to follow systemic approaches. In others, R&D and innovation policy is to a large extent 'anchored' in the Community Support framework: strengthening the in-house capabilities of companies is an important element. In the new Member Countries there appears to be a need for international contacts and co-operation, so that SMEs become aware of the latest international technology developments. In many Member States a large proportion of R&D and innovation programmes actively support the technology upgrading of SMEs, namely by promoting their absorptive capacities and know-how/technology transfer. Achieving an optimal involvement of SMEs in R&D activities remains a prevailing policy objective of EU Member States. Policies aiming at boosting the R&D performance of SMEs in Europe are showing an increasing segmentation and complexity to take account of the heterogeneity of SMEs and their developmental stage. Policy mix approaches are being increasingly followed to optimise the targeted effects and allow for additionality in terms of impacts on SMEs. Different types of schemes are being put in place to enable SMEs to perform or being involved on R&D activities and allow them to evolve, e.g. through: (i) mobility into SMEs; (ii) provision of grants to highly qualified personnel engaged in R&D projects with interest to the SME; (iii) employment of highly skilled personnel by providing incentives, for instance, of a fiscal nature. With regard to financing, new types of financial instruments (capital grants, reimbursable advances, risk/venture capital, guarantee schemes, etc.) are put in place to meet the needs of SMEs. Risk/venture capital represent a key financial incentive for creating new R&D and Innovation based firms. The general situation in Member States can however be characterised by an absence of specific policies which discriminate and exclusively address R&D activities in SMEs. SMEs are often an implicit target group of general R&D promotion policies.

A number of lessons were learnt from this first cycle of the application of the Open Method of Coordination. The expert groups collected and discussed information on the policies in Member States with respect to the five fields selected by CREST. This process led to a process of benchmarking and mutual learning and eventually led to the formulation of recommendations from CREST to support the Action Plan proposed by the Commission.

2.1.3. The role of ERAWATCH

ERAWATCH has been conceived to provide a strategic intelligence service to support research policy-making in Europe. Its overall aim is to support evidence-based policy-making in the research field and to contribute to the realisation of the European Research Area by providing a better knowledge and a better understanding of national and regional research systems and of the environment in which they operate. Data on national and regional research structures, organisations and policy developments will be collected, organized and structured. Policy trends and the impacts of factors influencing them will be analysed and reported on. ERAWATCH is targeted at all those involved in research policy-making in Europe. The service will be accessible through the Web. In order to respond to the Member State needs, the ERAWATCH Advisory Group was set-up at the end of 2003 under the aegis of the High Level Group for "Benchmarking of National RTD Policies, Mapping of S&T Excellence and Networking of National RTD Programmes." The Advisory Group is composed of

representatives from research ministries and research agencies in the Member States. ERAWATCH is an ambitious long-term undertaking. The aim is to develop over time a systematic coverage of all key issues. Starting from beginning 2005, it will also provide overviews to monitor the implementation of the 3% Action Plan together with more in-depth analytical work to support the Open Method of Coordination.

2.2. Trends in research investment

2.2.1. Overall R&D investment

Since 2002 most Member States have adopted national targets to raise R&D investment in line with the Barcelona objective (see Figure 1 below). However, even assuming that the various national objectives for public and private funding adopted by Member States are successfully achieved, it can be estimated that the R&D intensity in the EU will only reach approximately 2.5% in 2010 (based on an annual growth rate for GDP of 2 %). It is therefore clear that supplementary efforts must be made, both at national and EU level.

Latest official data from Eurostat show that EU-25 R&D expenditure for 2002 was 1.93 % of GDP. A more up-to-date assessment of current progress towards the Barcelona objective is made difficult by the delay in the publication of official statistics on R&D investment. The aim of the R&D investment Snapshot is therefore to use provisional figures and unofficial estimates for 2004 provisions to offer an approximate overview of current trends and the overall state of progress towards the Barcelona goals.²⁹ Where available, some estimates were gathered through CREST: direct public funding of R&D based on provisional national budgets; estimated indirect support given to R&D through fiscal incentives and other indirect measures; anticipated funding of R&D coming from the private sector.

²⁹ To be made available at http://europa.eu.int/comm/research/era/3pct/index_en.html

Figure 1 R&D intensities and targets in Member States and beyond

Country	R&D intensity (GERD as % of GDP) [1]		Member State Targets (GERD as % of GDP)	
	Total GERD [2]	Private sector funding (GERD funded by Industry) [3]	Total	Private sector funding
Belgium	2.33	1.40	3% (2010)	2% (2010)
Czech Republic	1.35	0.65	2% (2010)	1% (2010)
Denmark	2.60	1.48	3% (2010)	2% (2010)
Germany	2.50	1.63	3% (2010)	2% (2010)
Estonia	0.77	0.22	1.1% (2004) 1.5% (2006)	-
Greece	0.64	0.21	1.5% (2010)	0.6% (2010)
Spain	1.11	0.50	1.4%-1.5% (2007)	0.8%-0.9% (2007)
France	2.19	1.18	3% (2010)	2% (2010)
Ireland	1.12	0.77	2.5% (2010)	1.7% (2010)
Italy	1.16	0.43	1.75% (2006)	0.75% (2006)
Cyprus	0.33	0.05	0.5% (2006)	-
Latvia	0.39	0.09	2% (2010)	1% (2010)
Lithuania	0.68	0.19	1.5% (2006)	0.8% (2006)
Luxembourg	1.71	1.55	1% (2010) [4]	-
Hungary	0.97	0.29	2% (2010)	1% (2010)
Malta			-	-
Netherlands	1.89	0.98	Close to EU max (2010)	> EU average (2005)
Austria	2.28	0.94	2.5% (2006) 3% (2010)	-
Poland	0.59	0.18	1.5% (2006)	0.9% (2006)
Portugal	0.79	0.27	1.2% (2006) 1.6% (2010)	-
Slovenia	1.53	0.92	3% (2010)	2% (2010)
Slovakia	0.57	0.26	1.8% (2010)	1.2% (2010)
Finland	3.51	2.40	> 3.5% from 2002 onwards	-
Sweden	4.27	3.07	Maintain current level	-
United Kingdom	1.87	0.88	2.5% (2014)	1.7% (2014)
EU-15	1.99	1.13	3% (2010)	2% (2010)
EU-25	1.93	1.09	3% (2010)	2% (2010)
Iceland	3.09	-	-	-
Norway	1.89	0.82 (0.81)	OECD average (2005)	60% of total R&D funding (2005)
Switzerland	2.57	1.82	approx. 2.8 (2007)	approx. 1.8 (2007)
Bulgaria	0.50	0.12	Accelerate current rate of improvement	Accelerate current rate of improvement
Romania	0.40	0.24	1% (2007)	0.5% (2007)
Turkey	0.66	-	-	-
United States	2.76	1.63	-	-
Japan	3.12	2.31	-	-
Israel	4.4	3.5	Maintain current levels	-

[1] Eurostat / Newcronos Feb 2005).

[2] 2003 or latest available year. EU-15, EU-25, IT, UK, IS, TR, JP: 2002; EL, NL, SE: 2001; LU, CH: 2000; AT: 2004.

[3] 2002 or latest available year. BE, DK, EL, IE, NL, PT, SE: 2001; LU: 2000; IT: 1996, CZ, DE, HU, SK, US: 2003; AT: 2004.

[4] Only accounts for R&D government funding

2.2.2. *Public support*

Concerning **direct public funding**, latest estimates show that a majority of Member States have increased their level of direct public funding of R&D as a percentage of GDP since 2002 but substantial further progress must be made in order for the EU to reach the Barcelona goal of 1 %. Of the former EU-15 countries, most of those which had the lowest levels of direct public funding of R&D as a percentage of GDP in the earlier period have not reacted with sufficient impetus since 2002. At the same time, a large majority of those which had higher than average levels in 2002 have entered a period of stagnation since that date. The average annual growth rate in direct public funding of R&D in the EU can be estimated for 2002-2003 at 0.6 %. This is significantly below the level of about 6.5% in real terms that is required for Europe to reach 1% GDP in 2010. An estimated figure of approximately 2.5 % for 2003-2004 is more encouraging however, and the comparatively favourable economic outlook for 2005 should allow Member States to start to maintain or even build on this in the coming years.

Concerning the **overall public support to R&D**, a more complete and balanced picture of public support to R&D investment is gained when **fiscal measures to stimulate private R&D investment** are taken into account. Public support for R&D provided through fiscal incentives is becoming an increasingly significant element of overall policy mixes to boost private support to R&D, and major fiscal initiatives are being introduced or extended in many countries. The importance of fiscal measures can best be viewed by estimating their share of the total public support to private sector R&D, calculated as the sum of indirect measures and Business Expenditure on R&D (BERD) financed by government³⁰. This figure has increased substantially since 2002 in most of the countries implementing fiscal measures and exceeded 50 % in a number of Member States in 2004, demonstrating that indirect measures are currently the single most important element of public support to business R&D in those countries.

2.2.3. *Private sector funding*

In considering the R&D investment snapshot, greater caution must be taken in drawing conclusions from estimates for private sector funding than with those for public support. Only 16 Member States were able to provide estimates for anticipated private sector funding for 2003, of which only 13 were also able to do so for 2004, and some of the larger EU economies are among those with no data available for either year. Furthermore, the values have been estimated through a variety of different methods (on the basis of surveys, projections etc.). Nevertheless, it is clear from the information available that the situation is very different across Member States and that major progress is required in order to approach the objective that private sector funding of R&D should reach 2 % of GDP by 2010. When the Snapshot estimates are viewed as a percentage of GDP, values for 2003 are below 0.5 % in 6 Member States (of which 5 new Member States), between 0.5 % and 1 % in 6 Member States (of which 2 new Member States) and above 1 % in only 4 Member States (none of the new Member States).

³⁰ Based on DG Research's estimate for BERD in 2002

3. INTERNATIONAL COOPERATION AGREEMENTS

Sharing research and scientific know-how between countries and communities is more crucial than ever in the worldwide knowledge based societies. It is a key to improving economic growth, building sustainable development, tackling poverty and creating a worldwide network for the progress of science and technology. In this context, the international dimension of the Union's research has grown significantly under the Sixth Framework Programme, in the frame of the European Research Area. The European Union has indeed a broad spectrum of RTD instruments to collaborate with international partners.

Bilateral S&T co-operation agreements with third countries are an important instrument to realise the opening of the European Research Area to the rest of the world. In 2003, the conclusion of such agreements with many industrial countries and emerging economies that have strong S&T capacities reinforced co-operation and partnerships. The Mediterranean region benefited from the conclusion of S&T agreements with Morocco and Tunisia, while the conclusion of an agreement with Chile and the signature of an agreement with Mexico and Brazil strengthened research cooperation with Latin America.

Year 2003 also saw the renewal of the S&T agreements with Russia (entered into force in February 2004) and Ukraine (February 2003), the preparation of the renewal of the agreement with the United States (entered into force in October 2004) and the launch of negotiations with Japan. These partnerships are based on reciprocity of access to knowledge and know-how, the pooling of resources and the equitable sharing of risks and benefits for wide-ranging, high quality research at the least cost and of benefit to all. To achieve it, the European Commission sets up a joint forum with the relevant country. The forum discusses areas in which S&T cooperation should be prioritised as well as means for implementation.

Association S&T agreements were significant tools for easing the path of the ten accession states to full Union membership. The three remaining candidate countries, Bulgaria, Romania and Turkey concluded **memoranda of understanding** based on the General Agreement on "Association of candidate countries to Community programmes" and are therefore fully associated to FP6.

S&T agreements associating the EFTA countries (Liechtenstein, Norway, Iceland), Switzerland and Israel to FP6 have also been concluded. The agreement with the EFTA countries entered into force in January 2003, while the S&T co-operation agreement with Israel was signed in June 2003 (and concluded in April 2004) and the agreement with the Swiss Confederation in January 2004. This allowed an effective participation of all these countries in FP6 activities.

The EU and its international partners gained much from these S&T cooperation agreements. The benefits include access to European research programmes and results for third countries, and vice-versa. They help protect property rights by putting in place common standards to ensure that innovators are able to reap the rewards of their creativity. They also help to dismantle financial barriers that inhibit joint scientific activities.

While the European Community talked directly with large individual countries, it also conducted **S&T policy dialogue** at a regional level. The aim is to strengthen cooperation of mutual interest around jointly identified objectives, while giving consideration to the potential and needs of these countries and regions.

The dialogue with ALCUE (Latin-American and Caribbean countries) was consolidated with the set up in 2003 of a working group in charge of the implementation of the Action Plan for S&T co-operation that was defined in 2002. The main task of this working group is to find ways to promote policy research and analysis, and try to come up with new methods of sharing knowledge and information across ALCUE regions. Foresight and forecasting tools able to predict future trends and needs in the research sector will be used to improve the coordination of research and innovation policies.

In the framework of the EU-ASEM (Asia-Europe meeting) dialogues, platforms composed by experts from the world of science, industry and civil society, were set up to make best use of ASEM instruments to drive work in the priority areas that were defined at the Beijing Summit in 2002. The next step for the platforms is to prepare Action plans to guide work for the next years.

The Euro-Med Barcelona S&T Committee (Monitoring Committee for Euro-Mediterranean S&T Co-operation) met in Cairo in June 2003, where an Action Plan was elaborated with the aim to develop Euro-Mediterranean Partnership in S&T co-operation and to improve research and innovation systems in the Mediterranean countries so that they can better respond to social and economic development issues.

S&T co-operation plays also an important role in tackling the challenges faced by Western Balkan Countries. The EU and Western Balkan Ministers for Science adopted in Thessaloniki in June 2003 a Shared Policy vision and an Action Plan for future S&T cooperation, setting out future research priorities and identifying potential instruments for the implementation of this policy.

This type of regional dialogues was also conducted with the ACP states. The research priorities agreed by the EU and ACP partners are health, education, environment, agriculture, energy and transport, information and communication technology, sustainable trade.

All these agreements give clear political signal to the world that Europe is interested in common challenges and in searching to answer global questions. Region by region, Europe promotes an innovative shared vision of joint action to forge long-lasting partnerships and strong scientific expertise, as well as helping other countries to enjoy the benefits of the knowledge based society on an equal footing relationship.

4. CONSULTATION AND MONITORING PROCEDURES

4.1. Scientific and Technical Research Committee (CREST)

Within the framework of CREST's mandate to promote the co-ordination of Member State RTD activities in order to ensure mutual consistency between national policies and Community policy, the work of the Committee during 2003 concentrated mainly on: (i) the opening and co-ordination of national programmes; and (ii) the implementation of the OMC within the context of the Barcelona objective. During the same period, CREST continued to be regularly informed about communications from the Commission in the area of research policy and on the implementation of the 6th Framework Programme. CREST continued work on and was kept informed on issues related to the "Science and Society" Action Plan, and provided information within the context of the 3% action plan.

With respect to the opening of national research programmes, CREST decided to launch five pilots in the following fields: marine sciences, plant genomics, chemistry, astrophysics, complexity and complex systems. For each of these pilot projects, individual meetings were organised and the following issues discussed: information on "who does what" a prerequisite to co-operation; mutual learning and understanding by exchanging "good practices"; defining and preparing "opening up"; and the need for a frame for co-operation. Many of the fields piloted have been taken up within the context of ERA-NET. It seems appropriate to envisage within CREST further efforts on coordination of national programmes in two directions: (i) deepening and strengthening the co-ordination efforts in the five areas mentioned above to achieve an opening up of the programmes; and (ii) extending the number of areas where CREST could play a structuring role in co-ordinating.

With respect to Open Method of Coordination (see Section 3), the Competitiveness Council (Council Resolution of 22 September 2003. "Investing in Research in Europe") formally invited CREST to act as the operational interface between Member States when applying the open method of co-ordination (OMC) to policies supporting the Barcelona 3% objective.

4.2. Programme Committees

2003 was the first year of full operation for the new programme committees under the Specific programmes for the Sixth Framework Programme for research, technological development and demonstration for the EC and the programme committees for the Euratom part. An important new element in the work of the two EC programme committees is that they work in several configurations. The programme committee for the Specific programme "Integrating and strengthening the European Research Area" work in eight configurations and the programme committee for the Specific programme "Structuring the European Research Area" in five configurations. The configurations relate to the priorities and domains of each programme and one configuration also cover horizontal aspects, at the same time they need to work as one single programme committee for each of the Specific Programmes.

The two EC committees had over 60 meetings in 2003, while the two Euratom committees met 6 times. The EC committees were asked for more than 80 opinions by the Commission, both on draft decisions on the selection of proposals and on changes to the work programmes. All opinions given were favourable and they resulted in the adoption of almost 70 instruments by the Commission. The Commission also consulted the committees informally for exchanges of views and for information on various issues.

4.3. External Advisory Groups

Twelve Advisory Groups (AGs), i.e. Aeronautics, Energy, Food quality and Safety, Genomics and Biotechnology, Global Change and Ecosystems, Human resources, Information society, Nanotechnologies, Science and Society, Social Sciences and Humanities, Space and Sustainable surface transport, were created at the end of 2002 to cover the research activities and areas of FP6.

The AGs under FP6 provide the Commission with advice on the overall strategy to be followed in the development in the various research activities covered by the FP, as well as on the creation of the European Research Area. The relevant Commission services provide the scientific secretariat and take care of all practical arrangements for the AGs. Members participate in the groups in their individual capacity and each group ensures a balanced participation with respect to expertise, geographical origin (including New Member States, Candidate and Associated countries), sector of origin and gender.

For the year 2003 the main task for all AGs was to prepare the revision of the various work programmes in view of all FP6 calls for proposals. It should also be noted that a meeting between Commissioner Busquin and all AGs' Chairpersons and Vice-chairpersons took place in February 2003. This initiative proved very useful and was broadly welcome. It consisted in a frank and open debate on RTD-related issues, and allowed for the establishment of closer links between the various AGs and between the AGs and the Commission.

4.4. Monitoring

The 2003 Annual Monitoring exercise aimed to provide an analysis of and comments on the implementation of the 6th Framework Programme and the completion of previous framework programmes; make a review of methodologies used for objective setting, the development of indicators, and follow-up mechanisms; and monitor the Commission's follow up of recommendations in the 2002 monitoring exercise.

The 2003 exercise was the first to be based on the revised 'light touch' approach that has been adopted after recommendations made in previous Monitoring exercises. The aim was to bring this activity into line with the programme life cycles of the framework programmes and to allow the monitoring exercises to provide programme management with feedback through a more consistent focus on a small number of major issues in effective and efficient programme management, and when appropriate, strategic issues.

Using a single Panel of 7 members, the work was conducted efficiently and was well received by the Commission as a common-sense step towards simplification and greater effectiveness. In its report the Panel made comments concerning the overall management and implementation challenge as well as detailed findings and recommendations on implementation issues, including the revised system of annual monitoring. In its general remarks, the panel first noted the significant achievements that had been made in the efficient transition between FP5 and FP6, the large number of calls that had been launched and which had attracted a high number of proposals, the processing of these proposals in a faster time compared with FP5, the maintenance of a high standard of evaluation and the preparation that had been made for the Five Year Assessment (1999-2003). The panel noted that in general this was an "excellent and efficient performance".

More detailed comments in the report suggested the need for: a revised system of objectives and indicators used in FP6; the preparation of a concise table to show the details of expected and observed proposal-related workflows per activity area; shifting the focus of future monitoring exercises under FP6 from efficiency to effectiveness issues as the programme progresses; and further work in the area of dissemination of research results.

4.5. European Research Advisory Board (EURAB)

The European Research Advisory Board (EURAB), is a high level, independent, advisory committee set up by the Commission in September 2001 and consisting of 45 top experts from academia and industry to provide advice on the design and implementation of Community research policy³¹. EURAB has focused its attention on the creation of the European Research Area and the use of policy instruments such as the Framework Programmes, delivering advice and opinions on specific issues either at the request of the Commission or on its own initiative.

EURAB has greatly contributed to raising the profile of European research policy. From January 2003 to March 2004 EURAB produced 6 new recommendations. The recommendations concerned “The enlargement and the ERA”, “Research infrastructures”, “European Research Council”, “Bureau recommendations following a visit to Washington D.C. (US)”, “ERA and the social sciences and humanities”, and “European Technology platforms”. This follows the 7 recommendations produced during the first one and half years of EURAB’s existence.

³¹ For the composition and opinions of EURAB, see http://europa.eu.int/comm/research/eurab/index_en.html

5. STATISTICAL TABLES ON THE IMPLEMENTATION OF THE 6TH FRAMEWORK PROGRAMME

The statistical annex which accompanies this working document provides data on proposals received in 2003, on proposals retained for funding that were submitted in 2003, and on contracts signed in 2003 under the 6th Framework Programme. The format of the tables has been amended compared to previous Annual Reports to reflect the structure of the 6th Framework Programme and to provide fuller information. As this was the first year of full implementation of the 6th Framework Programme there were relatively few contracts signed in comparison to the number of proposals received.

5.1. Explanatory notes

The following notes apply to the tables:

- The group called “EU25-Member States” includes Cyprus, the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Malta, Poland, Slovakia and Slovenia, although they acceded to the European Union in May 2004.
- In the group called "Candidate and associated countries", Bulgaria, Romania are both candidate and associated. Turkey and Croatia are candidate countries but not associated. Iceland, Liechtenstein and Norway are associated in the framework of the European Economic Area, and Switzerland and Israel are associated in the framework of an association agreement.
- It is not possible to calculate countries' "success rates" from the number of proposals received and/or selected and those that result in contracts signed, since a proposal selected in year n might not result in a signed contract until year $n+1$.
- EC funding breakdown by participants is not available for Networks of Excellence. As a result, the total EC funding to FP6 participants is less than the total EC contribution to FP6 contracts.
- SME participation information is missing due to gaps in the provision of relevant data for recording in the central FP6 contracts database. Work to complete the database is ongoing.
- Euratom actions in the areas of research infrastructures and human resources and mobility are included under Specific Support Actions
- A collaborative link is assumed to exist between each pair of participants in each contract. The number of collaborative links created by a project is calculated in the following way:
 - i) When there are n participants from a given country in a project, the number of collaborative links between participants from the given country formed as a result of the project is assumed to be $n*(n-1)/2$.
 - ii) When there are m participants from one country and p from another country in a project, the number of collaborative links created between the two countries as a result of the project is assumed to be $m*p$.

The total number of collaborative links is calculated by summing across all projects.

5.2. List of tables in the statistical annex

Table 1a: FP6 Proposals submitted in 2003: participation by priority area and instrument

Table 1b: FP6 Proposals submitted in 2003: participation by priority area and country

Table 2a: FP6 Proposals retained for funding that were submitted in 2003: participation by priority area and instrument

Table 2b: FP6 Proposals retained for funding that were submitted in 2003: participation by priority area and country

Table 3a: FP6 Contracts signed in 2003: Participation and contribution by priority area and instrument

Table 3b: FP6 Contracts signed in 2003: Participation and contribution by priority area and type of beneficiary

Table 3c: FP6 Contracts signed in 2003: Participation and contribution by priority area and country

Table 3d: FP6 Contracts signed in 2003: Participation and contribution by instrument and country

Table 3e: FP6 Contracts signed in 2003: Participation and contribution by type of beneficiary and country

Table 4: Collaborative links within contracts signed in 2003