



Science and Society **Action Plan**



SCIENCE & SOCIETY

European
Research
Area

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Foreword by Philippe Busquin



In a knowledge-based society, democratic governance must ensure that citizens are able to make an informed choice from the options made available to them by responsible scientific and technological progress.

The latest Eurobarometer published by the Commission indicates the enormous amount of progress that needs to be achieved in this connection: while scientists still enjoy the trust of Europeans, only half of the Europeans consulted said that they were interested in science and many of them consider themselves to be poorly informed.

The aim of the European Commission's Science and Society Action Plan is therefore to pool efforts at European level to develop stronger and more harmonious relations between science and society.

It is at the intersection of three major Community debates.

First of all, it is intended to support the strategic goal set by the European Union in Lisbon of becoming by 2010 the most competitive and dynamic knowledge-based economy in the world.

It is also part of the process of creating the European Research Area, a process set in motion by the European Commission in January 2000, and follows on from the Commission Staff Working Paper of November 2000 on Science, Society and the Citizen in Europe, which launched the debate in this connection.

Thirdly, it is intended to contribute to implementing the White Paper on European Governance and the debate on the future of Europe.

Its objective is to put into practice ideas put forward in these debates concerning the links between science and society. To this end, it proposes 38 actions to be undertaken jointly with Member States, the regional authorities, scientists, policy makers, businesses and other stakeholders in civil society.

It will cover education, scientific and technological culture, the participation of citizens and civil society in the formulation and implementation of science policies in Europe, and the use of scientific knowledge complying with common ethical rules in the formulation of responsible policies.

As with the creation of the European Research Area, this Action Plan will only have a significant impact if the Member States themselves make joint and coordinated efforts. The Commission, for its part, will act as a catalyst to give a sense of direction and ensure consistency at Community level.

A handwritten signature in black ink, consisting of a large 'P' followed by a stylized 'B' and a flourish.

Philippe Busquin
Member of the European Commission
Commissioner for Research

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Background

This action plan is presented at the request of the Research Council of 26 June 2001. It is part of the process of creating a real European Research Area⁽¹⁾, launched by the European Commission in January 2000.

It is a follow-up to the Commission staff working paper "Science, society and the citizen in Europe"⁽²⁾, which in November 2000 set the basis for the debate on the relationship of science and technology with society and Europe's citizens⁽³⁾.

Its aim is to support the strategic goal set by the European Union in Lisbon: to become, by 2010, the most competitive and dynamic knowledge-based economy in the world, capable of sustainable economic growth with more and better jobs and greater social cohesion.

The plan seeks to contribute significantly to implementing the White Paper on European Governance⁽⁴⁾, adopted by the Commission on 25 July 2001. It draws, moreover, on the reflections emanating from preparatory hearings and seminars⁽⁵⁾, in particular the "Science and Governance" conference held in October 2000. In addition, it seeks to support

and intensify the political process instituted in 1999 to enhance the participation and role of women in research⁽⁶⁾.

This plan takes into consideration the opinion of the European Parliament, the Economic and Social Committee and the Committee of the Regions on the European Research Area, together with the opinion of the Economic and Social Committee and the CREST report on the Commission staff working paper referred to previously. The discussions on education, science and society which took place in Uppsala on 2 March 2001 during an informal meeting of the Education and Research Ministers⁽⁷⁾ have also been taken into account.

Finally, the debates initiated in the context of the action plan "eLearning⁽⁸⁾ – Designing tomorrow's education" will be taken into account with a view to enhancing the contribution of information and communication technologies to science education and – more generally – to creating the foundations for active citizenship, so that it is society itself that governs which scientific choices are made and controls their impact.

(1) "Towards a European Research Area", COM(2000)6, 18.01.2000.

(2) SEC(2000)1973, 14.11.2000.

(3) See the Science and Society Forum: <http://www.cordis.lu/rtd2002/science-society/home.htm>.

(4) "European governance: a White Paper", COM(2001)428, 25.07.2001.

(5) See in particular the report of the interservices working group "Democratising expertise and establishing European scientific reference systems", available on the Commission's governance site at http://europa.eu.int/comm/governance/areas/group2/report_en.pdf

(6) Commission Communication: "Women and science: mobilising women to enrich European research", COM(99)76, final, Council Resolution of 20 May 1999, OJ C 201, 16.07.1999, European Parliament Resolution of 3 February 2000 (PE 284.656), Commission staff working paper: "Women and science, the gender dimension as a leverage for reforming science", 15 May 2001, SEC(2001)771

(7) Joint DG RTD and EAC Commission staff working paper "Science, education and research: Towards a knowledge-based society", in preparation for the informal meeting of research and education ministers on 2 and 3 March 2001 in Uppsala.

(8) <http://europa.eu.int/comm/education/elearning/index.html>

Science and society⁽⁹⁾: towards a new partnership

At the dawn of the 21st century, as the economic integration of an enlarging European Union becomes a tangible reality with the introduction of the Euro, our society is faced with the challenge of finding its proper place in a world shaken by economic and political turbulence.

Examples abound to show that knowledge, in particular science, technology and innovation, are indispensable to meet this challenge. Every day, scientific and technological progress contributes new innovations essential to our quality of life and international competitiveness⁽¹⁰⁾. Scientific cooperation is also often an important factor in dialogue with countries outside the EU⁽¹¹⁾.

However, there are indications that the immense potential of our achievements is out of step with European citizens' current needs and aspirations, such as peace, jobs, security and sustainable development of the planet.

The October 2001 Eurobarometer Survey⁽¹²⁾ of European attitudes to science gives a mixed picture, ranging from confidence and hope to lack of interest in scientific activities or even fears regarding some of their impacts.

80 % of Europeans believe that science will one day conquer diseases such as cancer or AIDS, and scientists enjoy a high level of public confidence, to the extent that 72% of the respondents said they would like politicians more frequently to use expert advice in making their choices. Despite these expectations and the climate of confidence, the same survey also shows that Europe's citizens do not always have a very positive perception of science and technology, and that science is remote for some sections of the population.

Industrial hazards and ethical issues are widely highlighted in the media, raising questions and reinforcing the public's desire for progress to be more closely monitored. Some people feel that science and technology are changing their lives too quickly.

Although progress has been made, too many stereotypes still keep women out of science and deprive it of the diversity sorely needed for a more harmonious contribution to political, social and economic life.

Young people, moreover, no longer find studying science and scientific careers sufficiently attractive. Together with demographic trends, this potentially affects the labour market where industry has difficulties in recruiting the engineers and scientists needed.

Europe would therefore gain by assembling in a Community framework the efforts deployed in the Member States to improve the European public's ability to assess the scientific and technological issues of the day, and to motivate them to become more involved in science.

The Commission's strategy

The Commission will focus its attention in this action plan on a selected limited number of new actions of high Community added-value designed to:

- **Promote scientific and education culture in Europe**
First of all, people must become more familiar with science and technology. It will be essential in this respect to give science and technology a higher profile in the media and education in Europe to stimulate young people's spirit of enterprise and whet their appetite for science studies and careers. This is also needed to promote dialogue between science and society, in particular through organising major events at regular intervals.
- **Bring science policies closer to citizens**
The relationship between science, technology and innovation, on the one hand, and society, on the other, must be reconsidered. Science activities need to centre around the needs and aspirations of Europe's citizens to a greater extent than at present. In particular, in future,

(9) For the purposes of this communication, "science" includes all public and private activities of a scientific and technological nature, including social sciences. The term "society" covers all citizens and their associations, as well as businesses and public authorities.

(10) "Innovation in a knowledge-driven economy", COM(2000)567, 20.09.2000.

(11) "The international dimension of the European Research Area", COM(2001)346, 25.06.01.

(12) An opinion poll "Europeans, science and technology" was conducted at the Commission's request in the fifteen Member States between 10 May and 15 June 2001.

women must be able to participate more fully in science, and science must anticipate tomorrow's issues.

- **Put responsible science at the heart of policy making**

Most policies have a scientific and technological dimension and decisions must be supported by transparent, responsible opinions based on ethical research. It is therefore necessary to strengthen the ethical basis of scientific and technological activities, to detect and assess the risks inherent in progress, and to manage them responsibly on the basis of past experience.

The activities planned under these three themes will be conducted in close cooperation with Member States and the candidate countries, and – beyond Europe – with third countries and international organisations. Numerous players will be involved: local and regional public authorities, the general public, civil society, industry, etc.

The Commission will act as a catalyst, using all the means available at Community level and especially its research policy instruments⁽¹³⁾ (networking, accompanying meas-

ures, etc.). It is clear, however, in the context of the European Research Area that **significant results can be expected only if Member States themselves make an all-out effort in a joint, coordinated approach with the Commission**. In this context, the Council Resolution of 26 June 2001 calling for this action plan is addressed as much to Member States as to the Commission.

It is also important to stress that this action plan is part of a gradual process in which the monitoring of specific indicators, the assessment of the impacts of the activities adopted and the regular review of the action plan will require the active involvement of all the parties.

Finally, the future-oriented nature of the goals should not conceal the urgency of certain problems and the Commission has taken care to set sufficiently early deadlines to maintain the momentum over the next few years. The activities will be launched by the Commission as of 2002. An overview and an assessment of the first two years of the action plan will then be presented to the parties involved in 2004.

(13) Many of the activities in the action plan will be implemented through the Community RTD framework programmes. The Commission will ensure appropriate co-ordination between all activities relevant to science and society, including other framework programme activities and those implemented through other Community policy instruments.

1. Promoting scientific education and culture in Europe

1.1 Public awareness

If scientific and technological progress is to meet the needs of Europe's citizens and regain their support, they will need to have information that is understandable and of a high quality, as well as ready access to this specific culture.

The media, researchers, research institutions – in particular universities – as well as industry must play their public information role to the full. They must be capable of communicating and engaging in debate on scientific issues in a rigorous and comprehensible professional manner, as well as explaining frankly the benefits and limitations of scientific progress.

Dissemination of scientific information

In order to provide reliable, relevant information to the general public, it will be necessary to support independent sources of public information through action at European level. It is important at the same time to develop thematic, multilingual scientific training modules aimed at journalists in the written and audio-visual media.

Action 1

The Commission, in cooperation with the Member States, will set up a study group comprising journalists and representatives of the press in order to examine the best way of ensuring efficient dissemination of scientific information at European level, for example by promoting the establishment of a European scientific press agency or by facilitating the creation of a network for the exchange by professionals of information destined for the general public.

Alpha-Galileo

Alpha Galileo Europe is an Internet service for providing tailored information to the media. It is a database of press releases, details of events, images and background information on science and technological development within Europe. An e-mailing alert system based on keywords allows journalists to access breaking news in their fields of interest.

Relations between science and the media can sometimes be polemic. In some countries, guidelines for relations between the media and the scientific community, and vice versa, have been proposed. Journalists and scientists who make a particular effort in this area deserve encouragement.

Action 2

Representatives of the scientific community and the media will be brought together in a forum at European level to encourage and support the development of guidelines for a more fruitful interaction and mutual understanding between the two.

Action 3

The Commission will stimulate interest in scientific journalism and contribute to improving its quality by creating a special award for those involved in science communication with the public.

The Commission will study ways of promoting science in all multimedia forms including television (European festival of science films for the general public, exchange mechanisms between audio-visual production structures, networks of regional television channels, etc) under the MEDIA Plus programme⁽¹⁴⁾. The Commission already supports the development and production of audio-visual works, including creative documentaries, for broadcasting on European television channels. These audio-visual works may concern those popularising science and technology.

Action 4

An exchange forum (including an on-line forum) will be set up, taking account of the potential of the Internet for audio-visual dissemination⁽¹⁵⁾, to pursue reflections on the scientific content of multimedia tools.

Exploitation at European level of existing know-how for popularising science and technology in the major transnational and national research institutes and initiatives, such as the network of European Science museums, will be encouraged.

⁽¹⁴⁾ The MEDIA Programme entered into force in January 2001 and aims at strengthening the competitiveness of the European audio-visual industry with a series of measures dealing with the training of professionals, the development of production projects and companies, and the distribution and promotion of cinematographic works and audio-visual programmes.

⁽¹⁵⁾ It is worth noting that the European Commission's e-Europe action plan, designed inter alia to facilitate the widest possible access to the Internet, is an important initiative for the dissemination of scientific culture.

ECSITE network

ECSITE (European Collaborative for Science, Industry and Technology Exhibitions) is a European network of museums, science centers and other organisations involved in science communication to a wide public. Covering over 35 countries, it promotes the exchange of experience and novel ideas. ECSITE develops transnational projects for raising the public's awareness of science, funded by EC and other sources.

Action 5

The creation of products for broad general dissemination (television programmes, paper publications, etc.) will be promoted through targeted calls for tender and the use of existing instruments for this purpose will be encouraged.

Excellent scientific information products for the general public already exist in countries of the Union and should be more widely exploited through greater interchange between European countries.

Action 6

Targeted calls for proposals will provide an opportunity for translating the best public communication products (e.g. travelling or permanent exhibitions, documentaries, etc.) to other languages.

Science weeks in Europe

The European Science and Technology Week, created by the Commission in 1993, has become one of the activities under the Research and Technological Development Framework Programme. Member States and the associated countries also organise national activities to promote scientific and technical culture. Similar activities exist at regional and local level.

Member States and the Commission would gain by sharing their experiences and best practices.

Action 7

The establishment of a committee comprising organisers of national science weeks will facilitate synergies between the European Science week and the national science

weeks or festivals, in particular through the exchange of best practice and experiences of successful events. The European Science week will be greatly enhanced by linking national science weeks, and conversely national science weeks will be boosted by the organisation of events on a European scale.

Action 8

The Commission will particularly ensure that the achievements of Community research are better represented in the context of the European Week and contribute to the development of the national weeks.

Comparing national approaches to scientific and technical culture

The Commission has already launched an activity to benchmark national policies in five key areas, including "the promotion of RTD culture and public understanding of science". The results from the first cycle of benchmarking are due by mid 2002. Further activities for evaluating and analysing the current state of RTD culture in Europe will be developed.

Action 9

The impact of activities across Europe for raising public awareness of science, technology and innovation will be analysed through comparative research and studies (including benchmarking).

Promoting scientific culture in Portugal

Launched in June 1996, the Ciência Viva programme is the Portuguese Ministry of Science and Technology's contribution to the promotion of a scientific and technological culture among the Portuguese population. Ciência Viva is supported by Community Structural Funds. It is an open programme, promoting alliances and fostering autonomous actions through the definition of three fundamental action tools: a support programme aimed at experimental teaching and the promotion of scientific education in school, the national network of Ciência Viva centres and national scientific awareness campaigns.

Systematic public information on Community research activities

Because of their knowledge, researchers, research organisations and industry now have a particular responsibility vis-à-vis society in terms of providing scientific and technological information to Europe's citizens. Communication of scientific and technological progress should be stepped up, in particular the progress flowing from the Research and Technological Development Framework Programme.

Action 10

The conditions for Community Research and Technological Development Projects will require partners to systematically disseminate to the public in various forms the scientific and technological progress achieved under the Framework Programme for Research: media coverage, exhibitions, products for education and teaching purposes, public debates, etc.

1.2 Science education and careers

In a knowledge society, democracy requires citizens to have a certain scientific and technical knowledge as part of their basic skills⁽¹⁶⁾. Acquiring this and keeping it up to date has become as essential as mastering the 3Rs. Apart from this general knowledge, Europe needs a pool of scientists to ensure socio-economic development. We are not yet in this situation. It is therefore necessary, firstly, to get young boys and girls more interested in science by giving each pupil the basic knowledge they need to act as responsible citizens in the face of scientific choices and, secondly, to encourage them to embark on a scientific career. Adults who take up and continue learning later in life should also be encouraged to pursue a scientific career.

It is also necessary to ensure that people who have embarked on a scientific career can retain their enthusiasm and motivation and have opportunities for personal

(16) "Basic Skills" is a package of skills and competencies individuals need to flourish in today's society, and which should have been developed by the end of obligatory schooling or training, but can be augmented through lifelong learning. The provision of basic skills for all citizens is identified as a priority area in the Report on the concrete future objectives of education and training systems as well as in the Commission Communication on "Making a European Area of Lifelong Learning a Reality" (COM(2001)678 final).

development, without having to abandon scientific disciplines for other types of career. Public authorities are not solely responsible in this respect. Tangible results will only come if private actors fully assume their essential role and provide sufficiently attractive prospects and rewards.

Science and European objectives for education and training

There is a natural complementarity between the creation of the European Research Area and the European Higher Education Area. To enhance synergies, the Commission will endeavour to ensure that activities undertaken in the respective frameworks are both coherent and convergent.

In keeping with the mandate from the Lisbon Summit, the Commission, in concert with the Member States, began to define the future objectives of European education systems⁽¹⁷⁾ for the coming years. On this basis, a "Report on the concrete future objectives of education and training systems"⁽¹⁸⁾ was adopted on 12 February 2001 by the Education

Priority objective " Mathematics, Sciences and Technologies"

The Working Group on the priority objective "Mathematics, Sciences and Technologies" has begun its work designed to *increase recruitment to scientific and technological disciplines*. The four key questions addressed are as follows: increasing interest in mathematics, science and technology from an early age; motivating more young people to choose studies and careers in the fields of mathematics, science and technology, in particular research careers and scientific disciplines where there are shortages of qualified personnel, in a short and medium term perspective; improving gender balance among people learning mathematics, science and technology; and securing a sufficient number of qualified teachers in mathematics and scientific and technical subjects.

(17) "The concrete future objectives of education systems" COM(2001)59 final, 31.01.2001.

(18) Council report on the concrete future objectives of education and training systems, 5980/01 EDUC 18.

Council and endorsed by the Stockholm European Council. The Commission and Council will present a joint report together with a detailed work programme to the Barcelona European Council in 2002.

Applying the open coordination method recommended by the Lisbon European Council, working groups are already active on the three priority objectives aimed at: the development of skills for the knowledge society; access to information and communication technologies for all; and increased recruitment to scientific and technical disciplines (priority objective “mathematics, sciences and technologies”).

Action 11

Reflections will begin in 2002 on two other objectives closely linked to science and society: promoting active citizenship, equal opportunities and the gender dimension and social cohesion; and strengthening the links between working life, research and society as a whole.

Science and Society in the European Higher Education Area

Higher education establishments, and particularly universities – the natural homes for science, education and transmission of knowledge – have for several years been confronted with profound changes. These changes have involved their opening up to and interaction with society, from the local to the international level. Several recent initiatives at European level have encouraged this phenomenon, which combines a growing transnational dimension (networks, mobility, partnerships) and an intensification of the dialogue between universities and their locally-based societies.

Action 12

The Commission will explore with its partners in academia and the University Council for the Jean Monnet Project⁽¹⁹⁾ the possibility of including the theme “Science, society and European integration” among the subjects covered by the Jean Monnet chairs, alongside more classical disciplines such as law, economics, political science or history.

(19) The University Council is the academic body which assists the Commission with the academic and scientific follow-up of the Jean Monnet projects. The University Council was created by the Commission decision which instituted the Jean Monnet Project. Its current president is Mr José María Gil-Robles.

The Bologna process, launched on 19 June 1999 by the Education Ministers of 29 European countries, sets action priorities with a view to creating a European Higher Education Area. Firstly, the process facilitates the comparability, transparency and comprehensibility of university qualifications and pathways. Secondly, it encourages universities to devote more attention to the new challenges posed by the knowledge society: life-long learning, strengthening of the European and international dimension, quality of teaching and services, and the taking into account of specific local features in the design of study programmes.

In the training of scientists, particular attention must be given to areas that may prove essential in the exercise of their professions. These include project management (particularly on a European scale), law (intellectual property, ethics, etc) and communication (to the general public in particular).

Action 13

The development of European study courses at university level on science, technology and their historical, cultural and economic environments will be promoted through the creation of collaboration networks.

The Community programme SOCRATES – and in particular the Erasmus activity – contributes to the Bologna process through facilitating collaboration between higher educational establishments across Europe, as well as student and teacher exchanges. Erasmus Thematic Networks, in particular, are pan-European partnerships which develop projects and provide for forums where higher education institutions and other relevant bodies (associations (European), professional organisations, NGOs, IGOs, etc) reflect prospectively on issues concerning the study areas they address.

Action 14

The STEDE (Science Teacher Education Development in Europe) Erasmus Thematic Network seeks to take stock of the most relevant and recent findings in science research and educational theories in order to translate them into effective teaching and learning. STEDE will also address aspects related to the assessment of teaching and acquisition of scientific literacy. In addition, it will address the specific needs of science teachers, taking account of the specificities of the disciplines and of the cultural differences in the European Union and in the countries associated to the Socrates Programme.

Development and dissemination of new teaching tools

Teaching methods in general and of scientific subjects in particular have a major impact on the attitude of young people to sciences. The development and testing of education methods designed to stimulate youngsters' interest in science should be promoted at European level, such as the establishment of innovative interdisciplinary projects more attractive to children in primary and secondary schools.

Action 15

The Commission, in cooperation with the Member States, will support education research and development projects specific to science and technology. The dissemination of results will be promoted by exchanges of experience among teachers, conferences and public debates on the teaching of science and technology. Useful information will be made available on Internet sites.

What is Physics on Stage?

Physics on Stage was one of a number of initiatives that were launched under the European Science and Technology Week, 2000. During the course of that year a wide variety of national activities took place to identify outstanding projects and individuals in the field of physics teaching. National Steering Committees were set up in 22 European countries to select the best projects, which were then brought together during a five-day festival held at CERN in Geneva during the Science Week, 6-10 November. In addition to a physics fair, demonstrations and presentations, a number of working groups considered key issues facing physics teaching across Europe today. The project was initiated by the European Organisation for Nuclear Research (CERN), the European Space Agency (ESA) and the European Southern Observatory (ESO).

Taking advantage of SOCRATES-related actions and operations

Other initiatives such as the SOCRATES programme (in particular the Minerva action) and media events such as Netd@ys⁽²⁰⁾ (Internet Week) or eSchola (week focusing on innovative uses of the Internet in schools) can also aid dissemination. Such events will concentrate on developing projects of a high educational quality backed by adequate teaching resources.

One of their key objectives is to understand the possibilities of using the new media (Internet, videoconferences, new audio-visual facilities, etc) as learning and teaching resources.

With a view to developing sound educational resources for science, and to get pupils acting as "young researchers", cross-disciplinary partnerships should be encouraged. These would include education as well as youth and cultural organisations and other organisations in the science arena.

Action 16

In 2002, science education at school will be given particular attention with a view to launching cooperation projects that would bring together research and education actors. Specific efforts should be made to make education or research projects better known through operations such as eSchola⁽²¹⁾, WEEEST (Women Education and Employment in Science and Technology), Netd@ys or the Comenius week⁽²²⁾.

Mobility of researchers and students

The gradual emergence of a mobility culture for European researchers, thanks to the implementation of a "chain of opportunities" ranging from student grants to lifelong financial incentives for researchers, can contribute indi-

(20) <http://europa.eu.int/comm/education/netdays/>. In 2000, there were about 300 Netd@ys projects, 150 000 organisations participated from 85 countries and the Netd@ys European website received over 8m hits.

(21) <http://www.eun.org/cn/eschola/index.cfm>
<http://www.cittadellascienza.it>

(22) http://www.eun.org/eun.org2/eun/index_comenius.cfm

rectly to the public perception of science⁽²³⁾ and help raise the profile of scientific careers in the eyes of the general public. This will be further supported by the promotion of a European Area of Lifelong Learning with its specific action proposals to encourage mobility for citizens to pursue and make use of learning across Europe.

A European network of mobility centres will be set up. Its task will be to provide on-the-spot assistance to researchers and their families, as well as detailed information on programmes, funding and vacancies at European level.

Action 17

The European mobility centres will seek to integrate, as far as possible, information and awareness-raising activities aimed at the general public and at young people in particular.

Information on studies and scientific careers

There is a lack of comparable information on the scientific and technical content of study courses and on the science and technology careers proposed in the countries of the Union. This is detrimental to decision-taking at the Community and national levels in terms of achieving greater integration of education systems, research and innovation in Europe.

Action 18

The Commission will examine together with Member States the best way of launching a comparative European assessment of science and technology studies and careers, and of networking the national institutions that collect the necessary data.

Dissemination of this information should help young people in their choice of studies and careers and may serve as guidance to education policymakers and teaching establishments in adapting their programmes. To support young and adult learners in their learning and career choices, the Commission's Communication on "Making a European Area of Lifelong Learning a Reality" proposes several concrete initiatives. In terms of information, this includes the setting up of a European Internet portal on learning opportunities throughout Europe.

(23) See in particular the activities proposed by the Communication A mobility strategy for the European Research Area, COM(2001)331 final, 20.06.2001.

1.3 Dialogue with citizens

The acquisition of a basic grounding in science and technology by the European public and a regular flow of information to the public from experts are not in themselves enough to enable people to form an opinion. A true dialogue must therefore be instituted between science and society. There have been a great many initiatives in this area over the last few years: consensus conferences⁽²⁴⁾, citizens' juries⁽²⁵⁾, national and regional consultations, on-line forums, participative foresight programmes, etc. have emerged to satisfy this need for mutual understanding. Member States and the Commission must foster this type of dialogue at all levels: European, national, regional and local.

Towards the establishment of a dialogue at European level

Establishing a dialogue at the European level involves close cooperation between a wide range of stakeholders from research organisations, public authorities, media, citizens, civil society, enterprises, etc. The scientific and technological community will play an essential role by presenting issues of interest to the public at large, and by contributing to the debate.

Action 19

The Commission will examine, with representatives of the European scientific community interested in the promotion of science, the feasibility of holding regular events of high visibility and quality ("A European Convention for Science"). The Commission would assist in holding a major inaugural event in 2004 involving the widest possible range of stakeholders interested in science and technology⁽²⁶⁾ at European level.

(24) Consensus conferences, contrary to the name, usually spark a debate between experts and citizens on new subjects where regulation does not, as yet, exist.

(25) Citizens' juries usually seek to guide the decision-making process for which the form of "end solution" has already been defined (e.g. location of waste disposal site)

(26) The convention could be inspired by the long-established and well-renowned yearly events of the American Association for the Advancement of Science.

Local and regional dialogues on “Science and Society”

The local and regional levels are well suited to the “science and society” dialogue when the issues raised are of direct interest to citizens (environment, sustainable development, health, safety, urban transport, etc.). It would be desirable to promote participation by scientists in forums and hearings organised at local, regional and inter-regional (particularly cross-border) level, where the issues are also of pan-European interest.

Action 20

The organisation of local and regional “science and society” forums will be encouraged, inter alia through the development of a database listing scientists with communication skills.

Developing the European network of Science Shops⁽²⁷⁾

There are in Europe various types of Science Shops close to the citizen in which science is placed at the service of local communities and non-profitmaking associations⁽²⁸⁾. Hosted

by universities or independent, their common feature is that they answer questions from the public, citizens’ associations or NGOs on a wide variety of scientific issues. The first Science Shops were opened in the Netherlands in the 1970s and the idea was then taken up by about 10 other countries throughout the world. There are now over 60 Science Shops in Europe, mainly in the Netherlands, Germany, Austria, the United Kingdom and France.

The diversity and scope of questions is such that the most successful centres are having difficulty in satisfying demand. The Science Shops would gain from getting together, with the aid of the Commission, to pool their resources, their work and their experience.

Action 21

The networking of Science Shops in the regions of the Union and the candidate countries will be encouraged in particular through the creation of a permanent inventory and of a structure for the dissemination of work carried out on behalf of citizens and associations (e.g. database), and by the development of promotional tools.

(27) The English term is used generally.

(28) The SCIPAS project, financed under the 5th Framework Programme, enabled an open European network of Science Shops to be established: <http://www.bio.uu.nl/living-knowledge>

2. A science policy closer to the citizens

2.1 Involving civil society

The Commission is committed to improving transparency and consultation between administrations and civil society, as outlined in the White Paper on European Governance. To this end, it will adopt a set of minimum standards to be followed by its departments in all policy areas, including research. If citizens and civil society⁽²⁹⁾ are to become partners in the debate on science, technology and innovation in general and on the creation of the European Research Area in particular, it is not enough to simply keep them informed. They must also be given the opportunity to express their views in the appropriate bodies.

The Commission has already called on Member States to encourage stakeholder debates on innovation involving scientists, industry, consumers and public authorities, and pointed to the value of linkages between Member States' measures in this direction.

Strengthening the democratic process

Some countries in the Union have established technology assessment bureaux in their national parliaments to facilitate parliamentary decision-making and public debate.

At European level, the European Parliament's technology assessment network (EPTA) is made up of specialist organisations that advise national parliaments on the possible social, economic and environmental impacts of scientific and technological progress. The European Parliament has also set up its own scientific and technological options assessment team (STOA) which is a member of the EPTA network.

Procedures for the participation of civil society

Some Member States have a long tradition of organising participatory procedures, such as the consensus conferences and citizens' juries mentioned in the first chapter. They aim to provide a space for scrutiny and informed debate on important issues of public concern, bringing together the public, interest groups and policy makers. Scientists participate when the issue in question hinges in one way or another on scientific assessments. They complement the formal decision-making process, and can help pave the way for sound policies. More recently, Internet discussions have been launched on various topics at both national and European level.

Various participatory mechanisms have been used in shaping research policy. At the Community level, stakeholders, users and the scientific community have been increasingly involved in RTD policy development and implementation. Systematic and structured participation has most recently centred around EAGs (expert advisory groups)⁽³⁰⁾ and advisory bodies, for example, the newly established EURAB (European Research Advisory Board)⁽³¹⁾. Ad hoc arrangements such as platforms, workshops and other dialogue mechanisms are also used to enable interested parties to express their views. These experiences, however, now need to be widened and deepened to systematically include other sectors of civil society at all stages.

Action 22

The Commission will organise, through workshops and networks, an exchange of information and best practice between Member States and the regions on the use of participatory procedures for national and regional policies.

(29) Civil society organisations have been defined as those whose members have objectives and responsibilities that are of general interest and who also act as mediators between the public authorities and citizens. They may include trade unions and employers' organisations ("social partners"); non-governmental organisations; professional associations; charities; grass-roots organisations; organisations that involve citizens in local and municipal life; churches and religious communities.

(30) Twenty EAGs have been established for key actions under the Fifth RTD Framework Programme.

(31) C (2001)531/EC, EURATOM, 27.6.2001.

These exchanges may lead to additional measures for addressing pan-European issues involving science and technology. These could include interactions between participants in national events, as well as the possibility of organising participatory procedures at the European level⁽³²⁾.

Specific events for the European Research Area

The Commission itself often organises public consultations in preparation of policy initiatives. A recent example addressing both research and technological applications is the preparation of a strategic vision for life sciences and biotechnology. This consultation was facilitated by publication of a detailed consultation document, creation of an Internet dialogue platform, and a stakeholder conference held in September 2001. Shortly afterwards, the Commission established a GMO Round Table in the context of the European Research Area, bringing together European bio-safety researchers and other stakeholders, such as consumer organisations, national administrations and industry, to ensure that up-to-date knowledge accompanies the safe use of genetically modified organisms.

Action 23

The Commission will organise regular events enabling civil society to participate (in the form of public hearings, consensus conferences or interactive online forums⁽³³⁾) in specific issues (biotechnology, environment, information technologies, health, innovation, etc.), in cooperation with the Economic and Social Committee and the Committee of the Regions.

2.2 Producing gender equality in science

Research agendas often fail to take the specific needs of women into account. Women represent half of the student population, but hold only 10% of the senior positions in academia and even less in industry.

If society *as a whole* is to better understand and accept the developments in science and technology, specific measures must be taken to address both the under-representation of women in science, and the lack of attention paid to gender differences within research.

In 1999, the Commission launched an action plan on women and science, which set out a strategy to promote research by, for and about women, in co-operation with Member States and other key actors. This has proven a successful approach and will be maintained and developed in the next phase of activity.

New actions will be underpinned by reinforcing measures that are already in place. The Helsinki Group on Women and Science⁽³⁴⁾ will continue to provide the framework for pooling national policy experiences and exchanging good practice and will set out a comprehensive strategy for longer term co-operation. The Gender Watch System will be stepped up to improve the integration of the gender dimension within the Framework Programme and research policy in general.

This approach will be complemented by specific research to improve the understanding of gender and science issues in Europe and to develop tools to support the policy process.

Against this background, which will continue to evolve, the Commission will launch four new initiatives, as announced at its conference on Gender and Research in November 2001.

(32) For example, on 22 June 2001 the Commission adopted a proposal for a new action programme to financially support between 2002 and 2006 European non-governmental organisations (NGOs) primarily active in environmental protection COM(2001)337. This also promotes systematic involvement of NGOs at all stages of policy-shaping.

(33) For example on CORDIS, the Community Research and Development Information Service: <http://www.cordis.lu/home.html>

(34) The Helsinki Group was established in November 1999. Its members are civil servants involved in promoting women in scientific research at national level in the Member States and Associated States.

Establishing a European platform of women scientists

There is a need for a framework under which to exchange experience and good practice while facilitating co-operation and consultation across sciences. This would create the mechanism for involving women scientists more actively in the European policy process, by disseminating information and supporting lobbying and advocacy work. It would empower women scientists in their careers, with training actions and networking activities, a database of role models and mentors, campaigns and awareness-raising initiatives.

Action 24

A European platform will be set up to bring together networks of women scientists and organisations committed to gender equality in scientific research.

Monitoring progress towards gender equality in science

Monitoring progress in the field of gender equality cannot be achieved without appropriate indicators. The Helsinki Group on women and science has identified a specific need in the following key policy objectives: increasing the number of women in science; reducing both horizontal segregation (whereby women are concentrated in certain sectors or disciplines) and vertical segregation (whereby women tend to be in lower hierarchical positions); eliminating pay gaps; and ensuring fairness and equity.

Action 25

A set of gender indicators will be produced in co-operation with the statistical correspondents of the Helsinki Group on women and science to measure progress towards gender equality in European research.

Mobilising women scientists in the private sector

The private sector accounts for 60% of European research. It is a resource for innovation and represents a wide spectrum of scientific activity. So far, the activities have mainly covered the research undertaken within universities and research centers. It is of the utmost importance to make

sure that the situation of women in research carried out by enterprises is also analysed.

Action 26

An expert group will examine the role and place of women in research carried out in the private sector, identifying career patterns and examples of best practice, and will formulate recommendations to increase gender equality.

Promoting gender equality in science in the wider Europe

The situation of women scientists in Central and Eastern Europe has not been examined in depth to date. However, the political, social and economic developments in this region have created the need to analyse the specific situations encountered by women scientists in these countries, in order to provide them with tools for approaching policy makers, and to promote gender equality in the broader 'accession' context. This analysis will be undertaken in full recognition of the fact that there are lessons to be learned by EU Member States also in this exercise.

Action 27

A group of experts will examine the situation facing women scientists in Central and Eastern Europe and the Baltic States, and make recommendations for further work, in particular through the Helsinki Group on women and science and links with other appropriate policies.

2.3 Research and foresight for society

In view of the complexity of relations between science and society, there is a real need for multidisciplinary research and prospective studies, in order to facilitate not only a better understanding of interactions between science and society, but also to enhance the ability to respond to emerging crises and questions. Given the scale and nature of the issues to be covered, it would clearly be advantageous to proceed at Community level under the auspices of the RTD Framework Programme, including foresight studies by the JRC, or in the form of coordinated action by Member States.

The Commission will address in detail the historical, sociological and philosophical aspects of the development of rela-

tions between science and society, drawing on the human, economic and social sciences. Multidisciplinary research will be undertaken at European level and beyond, for example on natural and technological hazards, the effects of the principle of sustainable development⁽³⁵⁾, the impacts of the globalisation process or on topical subjects such as the use of science and technology to combat terrorism.

Open coordination of the regional, national and European levels

In addition to research, technological development and demonstration activities implemented under the RTD Framework Programme (including the Joint Research Centre), the coordination of European, national or regional research activities is a powerful tool with which to implement the European Research Area in the field of “science and society”⁽³⁶⁾.

Action 28

The Commission will facilitate the coordination of research and foresight exercises at regional, national and European level on issues related to the action plan. This coordination will take the form of forums, seminars for representatives of national ministries on the key issues of “science and society” or networks of centers of excellence.

(35) More particularly with regard to the priorities adopted in the European sustainable development strategy: climate change, public health hazards, poverty and social exclusion, pressure on natural resources, ageing populations, transport bottlenecks and pollution, as well as in areas of capital importance to the economy, social aspects and environmental impacts, such as the industrial sector and related services.

(36) Two expert groups have recently been set up by the Commission to explore issues relating to the strengthening of European foresight cooperation and the networking of regional initiatives and capacities in this area in the context of the European Research Area.

3. Responsible science at the heart of policy making

3.1 The ethical dimension in science and the new technologies

The rapid pace of scientific and technological progress can give rise to serious ethical questions of concern to all Europeans. These questions may also have potential implications for future generations.

European society is a rich cultural tapestry, made up of divergent ethical, religious, historical and philosophical backgrounds. While respecting these cultural differences, it is vital to make research functional and clearly supported by the citizens in both the Member States and in the candidate countries. The European Parliament has undertaken efforts to clarify common positions on ethically divergent questions.

The European Group on Ethics⁽³⁷⁾ has helped guide the Community policies on culturally sensitive ethical questions in science. The freedom of science and ethical considerations in research as expressed in the Charter of Fundamental Rights should be respected and implemented, where possible, also in other parts of the world. For example, support should be given to the Franco-German initiative for a world-wide convention on the prohibition of human reproductive cloning (Article 3 of the Charter) which has been addressed to the UN.

Several international organisations (governmental and non-governmental such as – Council of Europe, European Science Foundation, UNESCO, WHO, World Medical Association, FAO and others) are actively promoting ethics in science and research. Member States are represented in these organisations, and optimal use has to be made of these structures. A close co-operation should be sought with these organisations in order not to duplicate efforts, but rather create synergy and lead to a responsible international science system.

Making information more accessible

Europe at large is in need of a more systematic information facility on ethical issues in science, providing access, in various languages, to information on legislation, codes of conduct, best practices, and debates taking place in the different European countries. The groundwork for such an information and documentation system is being laid through an EU project linking the most important documentation centers on bioethics in Europe. The network should be extended to other fields of ethics and connected to other relevant information centers in the world, in order to become a future network of excellence.

Action 29

An information and documentation observatory will be developed to help track and analyse the development of ethical issues in science at national and international level.

A European public dialogue on ethics in science

As recommended by the European Parliament,⁽³⁸⁾ researchers, business circles, standard-setters and social players need to be encouraged to enter into a public dialogue across Member States and the Candidate Countries on the new leading-edge technologies as soon as they begin to emerge. This will enable responsible choices to be made, supported by the appropriate policies and implemented at the right time.

Action 30

An open dialogue will be established between NGOs, industry, the scientific community, religions, cultural groups, philosophical schools and other interested groups, stimulating an exchange of views and ideas on a range of critical issues, such as the ethical impact of new technologies on future generations, human dignity and integrity, 'infoethics' and sustainability. A variety of mechanisms will be used (focus groups, polling exercises, e-debates, workshops or institutionalised forums etc).

(37) The European Group on Ethics in Science and New Technologies is an independent, pluralist and multidisciplinary body which has been set up by the European Commission to give advice on ethical aspects of science and new technologies in connection with the preparation and implementation of Community legislation or policies (Communication to the Commission of 11 December 1997 on the establishment of the European Group on Ethics in Science and New Technologies (SEC(97)2404)).

(38) Report on the legal, ethical, economic and social implications of human genetics – Temporary Committee on Human Genetics and other New Technologies in Modern Medicine – Final A5-0391/2001.

Promoting awareness and integrity of researchers

The level of awareness among researchers of the ethical dimension of their activities is rather uneven in Europe. Actions to raise awareness of good scientific practices, including the ethical dimension, research integrity and the key elements of European legislation, conventions and codes of conduct should be encouraged. Basic training initiatives, together with the preparation of European training modules on ethics in science need to be created and disseminated. The development and the implementation of codes of conduct will be encouraged in various areas. These actions should take full account of cultural differences.

Action 31

Model courses and training modules will be developed in order to raise the awareness of researchers in the field of ethics.

Facilitating exchange between Ethics Committees

National Ethics Committees may wish to share results and experience at EU level, further to the activities of the Council of Europe. A Forum of National Ethics Committees of the EU and of candidate countries could offer opportunities for exchanges on specific topics of EU relevance, which would result in better policy co-ordination.

Networks of Local Ethics Committees will allow an exchange of views on minimum standards and would promote best practices in the evaluation of research projects with ethical content. Such networking will help industries to better operate across Europe, while creating more even conditions to protect our planet from potentially harmful effects of science.

Action 32

Networks of ethical committees will be fostered at both national and local levels. The aim will be closer co-operation and a more effective exchange of experience and best practice.

A dialogue on ethics with other regions of the world

The European Research Area is open to the world. It is therefore important to explore and understand the differences in the ethical framework for science in various regions of the world. European public research programmes (e.g. the EU funded initiative for malaria, tuberculosis, AIDS research) and industry, both sponsor clinical trials in developing countries that must follow agreed standards, such as the World Medical Association Helsinki declaration. Europe will support structures that promote ethical principles in science world-wide.

Action 33

An international dialogue on ethical principles will be developed through a series of conferences and workshops. An important aim will be to build up a capacity for ethical review in developing countries.

Protecting animals in research

The use of animals for research purposes is directly addressed by the Protocol on the protection and welfare of animals of the Treaty of Amsterdam. Efforts will be undertaken to improve the awareness of researchers on the principle of the 3Rs (replacement, reduction and refinement of animal experimentation) with a special attention to the species that are close to human beings.

Action 34

Networks of animal welfare committees will be fostered and training of young scientists on animal welfare issues will be promoted to support the implementation of European legislation on the protection of animals in research.

3.2 Risk governance

Innovation improves our quality of life, and is essential for economic growth. However, it can also raise uncertainties and concerns, and can bring new hazards to our health and environment. Scientific work is then needed to address these issues and to help identify and assess the risks posed by these hazards, and to reduce uncertainties.

There is rarely a simple answer to the question 'is it safe?' We know that we face a variety of risks in our everyday life. Some risks we take voluntarily, others simply cannot be avoided. When we decide whether something is 'safe', we consider not only the likelihood of harm but also factors such as the likely benefits and the existence of alternatives.

Risk governance – embracing risk identification, assessment, management and communication – has become a crucial but often highly controversial component of public policy.

In recent years the European Union has dramatically overhauled its risk assessment and risk management processes in the areas of consumer health and food safety. Regulatory measures in these areas are founded on scientific advice from committees based on the principles of excellence, independence and transparency⁽³⁹⁾. The Union is at the point of setting up a European Food Authority to provide independent risk assessment⁽⁴⁰⁾. The Commission has also set out its approach to the use of the Precautionary Principle⁽⁴¹⁾, suggesting guidelines for risk management when faced with scientific uncertainty, and stating general principles always to be applied in risk management⁽⁴²⁾.

Much has therefore already been achieved in improving transparency, accountability, and adaptation to the progress of scientific knowledge.

(39) *Communication on consumer health and food safety*, COM(1997)183, 30.04.1997.

(40) *Amended Proposal for a Regulation of the European Parliament and of the Council laying down the general principles and requirements of food law, establishing the European Food Authority, and laying down procedures in matters of food safety*; COM(2001) 475 final, 7.8.2001.

(41) *Communication from the Commission on the Precautionary Principle*; COM(2000)1, 02.02.2000.

(42) *Proportionality, non-discrimination, consistency, examination of the benefits and costs of action or lack of action, examination of scientific developments*.

Improving practices through networking at European level

Nevertheless, further steps can be taken. Firstly, the lessons already learned in the area of consumer health and food safety can be applied to other sectors. Secondly, in all areas, we should examine ways to provide for a more dynamic interface and better communication between risk managers, risk assessors and those carrying out the underpinning scientific research. Thirdly, we can strive to further open up risk governance to debate and scrutiny (e.g. 'What are the costs and benefits, and how do we measure them?' 'How safe is safe enough?'). In pursuing these aims, we must profit from information and good practice across and beyond the continent.

The Commission will examine ways of improving such an interface. This could include mechanisms that provide for dialogue, joint problem definition, and an iterative exchange of information and views. It will also pay special attention to the communication of risk issues.

Action 35

The Commission will initiate an exchange of experience and good practice between key actors concerned with risk issues, in different sectors and at different levels across Europe. In the light of this, it will elaborate guidelines for improved risk governance, including on how best to communicate scientific uncertainty and risk issues. These proposals would build on the existing policy framework.

Building mutual trust

The Commission supported the TRUSTNET project aimed at analysing the factors that influence the credibility, effectiveness and legitimacy of the scientific and regulatory framework for hazardous activities, as well as developing more coherent, comprehensive and equitable approaches for assessing and managing risks. Through a broad range of case studies, including sensitive issues related to the environment, energy and industry, it offered insight into the social management of risk. The project set up an informal network bringing together European decision-makers, academics, experts and stakeholders to promote dialogue and interaction.

3.3 The use of expertise

We need experts to reassure us, to warn us, and to shed light on complex and often controversial issues of the day. Experts help to identify problems, shape policies and stir the public debate on topics as diverse as climate change and genetically modified organisms.

Many channels exist for feeding advice from experts into science-based policy development. The well-structured system of scientific committees now established at the Community level for risk assessments in consumer health and food safety has been mentioned in section 3.2. Elsewhere, there are a variety of international and European mechanisms in policy areas such as air quality⁽⁴³⁾, climate change and fisheries. These are complemented by *ad hoc* arrangements according to the nature, urgency or state of knowledge of the issues to be addressed. Other layers and forms of advisory structures can be found at national level.

Within this framework a distinction can be made between collective, formal advice provided through committees or advisory groups mandated and established by policy-makers, and solicited or unsolicited opinions or findings, such as scientific information, provided by individuals or organisations outside any formal process (which may, nevertheless, assist formal advisory groups in arriving at their conclusions).

Against this diverse background, there is nevertheless a tendency for the process of using expertise to be contested and mistrusted.

Firstly, science is often perceived as dealing with certainty and hard facts, whereas in reality this is rarely the case, particularly at the frontier of research. Scientists are naturally cautious, and the advice they provide is often wrapped in caveats. There may also be more than one school of thought, or there may be maverick voices arguing against the mainstream. There can then be a sense of

(43) The Commission recently launched the "Clean Air for Europe" programme (CAFE), seeking to produce an integrated long-term strategy to protect human health and the environment from the effects of air pollution. The main aim of the programme is to coordinate the production, collection and validation of the scientific and technical data needed to elaborate a policy in this area.

Scientific advice for the Common Fisheries Policy

The major objective of the Common Fisheries Policy is to promote the sustainable and responsible exploitation of fisheries resources within and outside Community waters. To develop regulations in the light of the best available scientific advice, the Commission relies upon the International Council for the Exploration of the Seas, which is responsible for the collection and analysis of biological data relating to fish stocks of the North Atlantic.

The advice of the ICES committee on fish stocks management is then discussed within the Commission's own Scientific Technical and Economic Committee for Fisheries. Based on this, the Commission prepares its proposals for regulation, which are later presented to a separate advisory committee which channels the views of stakeholders (fishing industry, consumers, NGOs etc.).

frustration and despair when experts fail to provide simple answers to apparently simple questions. The conclusion: 'Even the experts don't know what they're talking about!' A more coherent interface is needed between the providers and receivers of advice, with mutual understanding and clear communication between the two.

Secondly, policy-makers at all levels do not always find it easy to tap into the resource of knowledge provided by the diversity of scientific cultures and range of specialised centers of excellence in Europe. At worst, they are open to allegations that only 'tame' experts are selected, known to support pre-formed policy decisions. There needs to be a more systematic and open approach, at national and European level, to identify the best expertise at the right time.

Thirdly, advice can appear remote if the public and stakeholders are excluded, and are unable or ill equipped to contribute to the debate and to challenge the experts and the advice they give. There is a need to open up the process by providing opportunities for the voicing of alternative views ('a competition of ideas'), for scrutiny and for constructive debate. Experience shows that when scientific networks link with national regulators, associate representatives of

the various stakeholders, including civil society where appropriate, and operate with transparent procedures the conflict potential of certain issues is largely defused and acceptance of the ensuing regulation increases⁽⁴⁴⁾.

The aim, then, is not only to instil a sense of trust, but also to deliver policies that are more robust.

As previously indicated, the Commission has been responding to these challenges through the revamping of its scientific committees in consumer health and food safety, and the imminent establishment of the European Food Authority.

The Commission now intends to spread good practices and to capitalise on lessons learned from the different policy sectors. For example, much can be done to provide more systematic and readily accessible information for the public on the mandate, membership, deliberations or recommendations of these different structures in all policy areas⁽⁴⁵⁾. A 'one-stop-shop' consolidating these details would also be beneficial for the public.

In developing and implementing the actions below, the Commission will maintain and reinforce a dialogue with Member State administrations, advisory bodies and other actors.

Setting guidelines for the use of expertise at Community level

The White Paper on European Governance identified the need for guidelines on the use of expertise⁽⁴⁶⁾. These guidelines, to be developed by an interdepartmental working group, will be published from June 2002. They will complement other actions from the White Paper, such as minimum standards for the consultation of civil society.

(44) Some of the networks that the JRC has set up in response to Member States' request, such as the network of GMO laboratories or the network on Integrated Pollution Prevention and Control, provide good examples of this type of interaction.

(45) Study on transparency and openness in scientific advisory committees: STOA, European Parliament, October 1998, PE 167 327/ Fin. St.

(46) This flows from the preparatory work on expertise: Democratising expertise and establishing scientific reference systems (group 1b), European Commission, July 2001.

(http://europa.eu.int/comm/governance/areas/group2/report_en.pdf)

Building on existing practices and experience, the guidelines should set out core principles, particularly for greater openness and accountability in the use of expertise in science-based policy development. The key aim is to establish and maintain the confidence of everyone who may be involved in, or rely on, the process. The guidelines should address, for example, public attendance at expert meetings, publication and scrutiny of advice, and the way in which the Commission explains how subsequent policy proposals take account of advice proffered. They should also provide for a widening of the expert base by encouraging recourse to multidisciplinary and multi-sectoral know-how, and by suggesting mechanisms for the involvement of the public, stakeholders and organised civil society.

Action 36

A set of guidelines will be established for the Commission's own practices in selecting and using expertise for policy-making. They could form the basis of a subsequent proposal for a common approach by other institutions and the Member States, and eventually the accession countries. Co-operation with Member States through a network, workshops, and other dialogue exchanges will enable experiences to be shared and best practices to be spread.

Improving the delivery of scientific support to policy makers

The Commission will continue to develop improved mechanisms for delivering scientific support to policy makers.

These mechanisms should capitalise on the full breadth and diversity of expertise available in Europe. They are intended to enhance the scientific support to policy-making beyond the implementation of formal regulatory procedures. Where relevant, they may be based on networks of researchers such as those created through the RTD Framework Programmes, including the JRC. Such networks should facilitate communication both between scientists themselves, and between scientists and policy-makers. Whilst they would function in conformity with the guidelines mentioned above, particularly with regard to the need for independence, transparency and breadth of know-how, a variety of models will be required to meet the demands of different sectors and time-scales. Two models can be identified now:

The first model combines a network of sources of scientific information with a database of previously prepared scientific conclusions on issues of public concern. The Commission could draw on such a resource when seeking information on specific policy-related questions. In the longer term, it could be made available to other policy-making authorities and to citizens and civil society.

Action 37

A pilot study will be conducted into the creation of an open internet-based network of scientists and organisations concerned with scientific issues. The aim will be to provide information for policy support.

The second model would consist of organisations or networks capable of providing validated data, harmonised information or support for policy-making. Such European Common Scientific Reference Systems (ECSRS) could play a supporting role in problem identification, policy-shaping, or long-term implementation of regulations. In its core areas of competence the Joint Research Centre will play a catalytic role in the establishment of these ECSRS.

Action 38

The Commission will publish a blueprint for European Common Scientific Reference Systems (ECSRS), setting out their scope and function, together with implementation proposals taking into consideration matters such as quality assurance and links to international systems. By taking stock of the sources of expertise currently used, prototype ECSRS specialising in priority topics will be identified. Further implementation will be supported in the next Framework Programme (2002-2006).

In addition, both models will provide a channel for individual scientists to flag, at an early stage, new developments and issues. This form of “horizon scanning” may trigger additional research to replicate or repudiate the early results, as well as give advance notice to formal risk assessment and risk management mechanisms if these already exist in the sector concerned. The networks could also facilitate the rapid mobilisation of expertise (e.g. “Scientific Help Desk”) in response to sudden or unexpected needs, for example, bio-terrorism.

Maintaining the momentum

The proposed action plan marks the beginning of a long process, the objective of which is to change the relationship between science and society. Many players are invited to participate: Member States, regions and cities, businesses, individual citizens, civil society as a whole, in particular NGOs, etc. Some of the planned activities will be more long term – e.g. in the field of education – while others, such as conferences, will be more *ad hoc*. In all cases, however, the resolution of the problems tackled at the Community level requires both a detailed knowledge of the European situation in all its diversity and a capacity to evaluate the impacts – and particularly the added value – of the action taken.

The action plan is based on a compendium of experience, facts and statistical data – which must be maintained and developed. With this in mind, and in order subsequently to update the plan, the Commission will produce an overview of “Science and society in the European Research Area”. This review of relations between science, technology,

research and development activities and European society will be based on numerous information sources (follow-up reports, the European Statistical System and national statistical offices, studies by national and European polling organisations, data supplied by the network of national and technological observatories, comparative studies at European and international level, Community research and foresight exercises, etc.).

This overview will also provide the opportunity to assess the impact of individual actions and the plan as a whole. This assessment will require both regular surveys and the monitoring of existing indicators, as well as a long-term reflection *inter alia* on the adaptation of assessment methodologies to needs.

The overview and the assessment of the action plan will be presented jointly in 2004 at the “European Convention for Science”.

European Commission

Communication from the Commission to the Council, the European Parliament,
the Economic and Social Committee and the Committee of the Regions

Science and Society – Action plan

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This Action Plan represents a new European initiative to develop a stronger and more harmonious relationship between the world of science and society at large. It sets out 38 actions dealing with the place of science in education and popular culture, involving citizens in science policy, the gender dimension, ethics, and governance. Whilst the European Commission intends to act as a catalysing force, these actions will require a concerted effort by actors in the member states, the regions, stakeholder groups and concerned citizens. The plan provides a common framework to monitor progress and to assess results.



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