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## FORESIGHTING EUROPE

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### Editorial

Knowledge is defined today as a learning and cognitive capacity. There is a fundamental distinction between information and knowledge, information consisting of data which, unlike knowledge, cannot generate new information on its own. Current literature presents several typologies of knowledge, based on its source or format, whether it is “implicit” or “explicit”, or on the distinction between knowledge that is “embrained”, “encultured” or “embedded”. This extension of the concept of knowledge is revealing a number of contemporary phenomena: firstly, the field of actors involved in producing knowledge is expanding; and, secondly, research activities themselves are being redefined. Reconceptualising knowledge could take us even further: it might enable “research” (the generic form of knowledge production) to have new economic and social impacts.

Foresight activities under FP6 were designed to provide a framework for EU-wide networking, mobilising actors at all levels. A multi-disciplinary and future-oriented expert group was set up in 2005 to analyse the trends and possible future changes in the way knowledge is produced by key actors within the European Research Area, as well as identifying their role in knowledge production. The main policy message delivered by the group, known as “The future of the key actors in the ERA”, is that “Europe must move beyond industrial-ERA challenges to embrace those of knowledge society”. The experts involved proposed specific actions to open, expand and integrate the ERA. In addition, they proposed initiatives for further investigation into the future of research.

The “European Science and Technology Foresight Knowledge Sharing Platform” was set up in order to help with the organisation of the “Foresight Community”, through knowledge-sharing activities and events. This issue of the “Foresighting Europe” Newsletter gives an overview of the main outcomes of three specific studies implemented within the framework of the Platform. The studies focus on three prospective key issues for EU research and innovation: the first feeds into European RTD policy in the area of international RTDI cooperation; the second looks at emerging S&T priorities in public research policies; and the third details practical guidelines for transport and sustainable development.

The study “Emerging science and technology priorities in public research policies in the EU, the US and Japan” identifies the scientific and technological developments and research areas in which Europe could take the lead in the coming years. The overview includes an analysis of why new developments in science and technology – and their economic and societal impact – could be seen as a priority for future EU research and innovation policies.

The broader international relations agenda has recently seen greater recognition of the role of S&T cooperation in development. “Scenarios for future scientific and technological developments in developing countries” – known as SCOPE 2015 – was commissioned in order to provide advice to the EU on RTD policies in relations with developing countries. The study considers a variety of visions (or scenarios) of what international RTDI cooperation might look like in 2015.

Europe’s Lisbon goals – in which economic dynamism and competitiveness progress alongside sustainability, employment and social cohesion – require policymakers to take a long-term view. Within the EU Member States, long-term planning can only be effective if the broader European context is taken into account. The study “Using Foresight to improve the science-policy relationship” shows that Foresight, as a tool for long-term public policy planning, is now just as relevant at the European level as it has previously been at the regional and national levels. The study builds on the design of a Foresight on European RTD policy in the area of transport, which integrates the goals of sustainable development.

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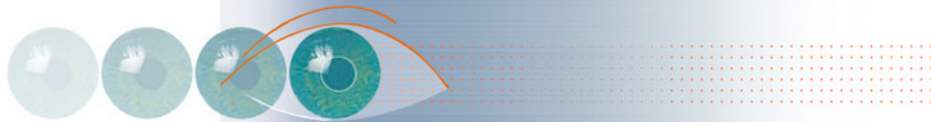
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*Shared visions, common research futures*



## The future of key actors in the European Research Area

In order to achieve a knowledge-intensive economy, we must rethink societal development and renew the frameworks put forward by the social and economic sciences. By redefining knowledge, we could allow research – the generic form of knowledge production – to have new economic and social impacts.

### AN EXPERT GROUP WAS SET UP IN 2005 ON “THE FUTURE OF KEY RESEARCH ACTORS IN THE ERA”

The purpose of establishing this group was to contribute to European RTD policy in order to help develop the performance and effectiveness of the European Research System. Its mandate was to undertake an exploratory prospective analysis, looking to 2020, of the role and importance of various actors in the ERA (such as universities, researchers, civil society, small and medium enterprises, big enterprises, and governmental bodies at the national and regional level) in the production of knowledge. This future-oriented and multi-disciplinary group analysed the trends and possible future changes in the way knowledge is produced by the actors involved, and the relative role and importance of these actors in knowledge production.

The principal concept underlying the work of the group is that a more knowledge-intensive economy and society calls for a reconceptualisation of societal development, and hence a renewal of the frameworks put forward by the social and economic sciences.

In fact, the expert group produced a series of eight working documents, which focus on the different actors relevant to the European Research system. The papers identify the key future trends in knowledge production, assess the relative importance of the actors in knowledge production within society, and develop scenarios on the future of the actors. The synthesis report<sup>1</sup> presents an analysis of the various individual reports and provides scenarios on the future of knowledge production in the European Research Area of 2020, as well as policy options on how to best adapt to future trends and changes in knowledge production in our society.

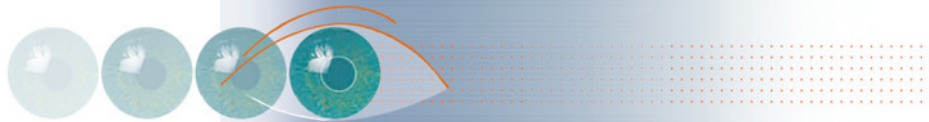
Four major transformations must be taken into account as EC decision-makers attempt to show leadership in the field of research:

- the nature of leadership itself is changing: authority, knowledge and networking are all becoming more pervasive and fluid;
- the nature of research is changing: specialisation, truth and knowledge diffusion are no longer tied together;
- the nature of cooperation is changing: trust, membership and community are all becoming spontaneous;
- the nature of the goals that have driven the relationships between leadership, research and cooperation are changing – the goals of survival, risk management and learning are all shifting from a world where the ends justified the means to one where the means are the ends.

The synthesis report highlights the importance of efforts – which are already well underway – to reinforce ERA’s role as an integrated base, which serves to overcome a wide range of geographic, institutional and disciplinary barriers to the sharing of knowledge.

**The main policy message is that Europe must move beyond industrial-ERA challenges to embrace those of knowledge society.**

<sup>1</sup> The future of key actors in the ERA, by Madeleine Akrich and Riel Miller.



## THE EXPERT GROUP PRODUCED A SET OF SPECIFIC POLICY ACTIONS TO OPEN, EXPAND AND INTEGRATE THE EUROPEAN RESEARCH AREA:

- Policies that put into practice expanded criteria for designing and funding research programmes for the European Research Area to include user-centred technological, organisational and social innovation;
- Policies that initiate experiments in order to validate the quality, trust and transparency of new forms and producers of knowledge (including individual independent researchers);
- Policies, both budgetary and regulatory, that create and facilitate new collaborative environments for research, including user-centred research, and new governance processes;
- Policies to enhance the capacity of policy-makers (including at the regional level) to recognise and facilitate new forms of research, and particularly new approaches to the governance of research processes;
- Policies to abolish national borders for researchers and students within and outside of Europe;
- Policies to strengthen the autonomy of universities, including areas which have so far been strictly controlled by most governments – such as a university’s strategic profile, and the selection of specialisations.

## Prospective studies of the Foresight S&T Knowledge Sharing Platform

In order to promote EU-wide Foresight approaches, prospective studies on key issues for EU research and innovation were implemented within the framework of the “European Science and Technology Foresight Knowledge Sharing Platform”. An overview of three of them is presented here.

### 1. SCENARIOS FOR FUTURE SCIENTIFIC AND TECHNOLOGICAL DEVELOPMENTS IN DEVELOPING COUNTRIES - “SCOPE 2015”

*The specific focus of SCOPE 2015 has been on RTDI cooperation with countries from the Commonwealth of Independent States (CIS), Sub-Saharan Africa (SSA), Maghreb and Mashreq (MEDA), and Latin America (LA). All four regions are important strategic partners for the EU and for a variety of different reasons, including trade, investment, the protection of habitats and the global environment, international security and migration. RTDI can make important contributions to all of these policy areas.*

#### DIFFERENT REGIONS: COMMON PROBLEMS, REGIONAL SPECIFICITIES

Although the four regions studied are very different, there is a strong similarity between the problems they are facing, which include chronic under-investment in RTD, “brain drain”, the weak development and lack of reform of RTDI institutions and governance, and minimal or non-existent capacities

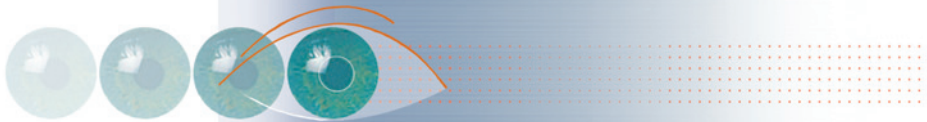
in new technologies such as nanotechnology. The regions also share a common enthusiasm for collaborating with EU scientists, but lack awareness of the available opportunities – there is therefore a strong interest in increasing RTDI linkages between countries in the same region.

While the regions are united by many common features, important differences also distinguish them from one another and even separate countries within the same region. Consequently, the report lists the different policy challenges to supporting RTDI in the various regions.

#### 1. COMMONWEALTH OF INDEPENDENT STATES (UKRAINE, KAZAKHSTAN, AZERBAIJAN AND GEORGIA): COOPERATION AMONG EUROPEANS

This is partially a European space that falls within the remit of the EC’s Neighbourhood Policy, giving it special strategic

<sup>2</sup> The studies can be downloaded from the Foresight website( <http://cordis.europa.eu/foresight/home.html>) and will be soon available in printed version



importance. The region has a highly-educated population with a rich and relatively varied scientific tradition. Its Soviet past has left behind a set of unique institutional arrangements and a legacy of practices that sometimes fit awkwardly with arrangements and practices elsewhere. Among the regions covered, this is the only one where the dominant areas of research are physics and engineering, along with mathematics and computer sciences.

**The main cooperation policy challenges associated with the region include:**

- changing mindsets and perspectives on the utility of research and innovation for sustainable socio-economic development;
- developing the “knowledge diplomacy” necessary for mainstreaming research and innovation agendas in the EC’s Neighbourhood Policy;
- implementing national institutional reform and consolidating research efforts;
- promoting innovation through the extension of EU25 policies and programmes to the CIS region;
- encouraging investment and partnership by the EU25 private sector;
- raising awareness of EU opportunities and improving participation rates by the region’s scientists;
- building more extensive intra-regional collaborative links;
- achieving greater coordination with the RTDI cooperation activities of other countries and of the international organisations active in the region.

**2. SUB-SAHARAN AFRICA (BOTSWANA, GHANA, KENYA AND NIGERIA): PUTTING INNOVATION AT THE HEART OF DEVELOPMENT**

This region contains many of the world’s poorest countries with pressing needs that call upon limited resources, leaving little room for RTDI activities. Political instability is rife and the apparatus of states is often underdeveloped. These countries have a heavy reliance upon donor aid which strongly influences the RTDI agenda. Reflecting developmental concerns, research in agriculture and medicine are the dominant areas of activity.

**The main cooperation policy challenges associated with the region include:**

- introducing an Africazone RTDI Scoreboard or Trendchart;
- introducing an RTDI Cohesion Plan (modelled on experiences in EU) to address regional disparities and assist weaker regions;
- establishing triangular research partnerships with the EU and other regions of the world;
- using FDI and multinationals to build the regional innovation system;

- providing support for start-ups, young entrepreneurs and entrepreneurial universities – but within a coherent national/regional innovation strategy that is relevant to social and economic needs;
- setting-up a network of Framework Programme National Contact Points for Africa;
- raising awareness on the importance of science and engineering investments to address basic needs and as vital in all policy areas;
- supporting skills development in science policy management and policy design in government.

**3. MEDA COUNTRIES (JORDAN, MOROCCO, AND TUNISIA): CREATING PROSPERITY TOGETHER**

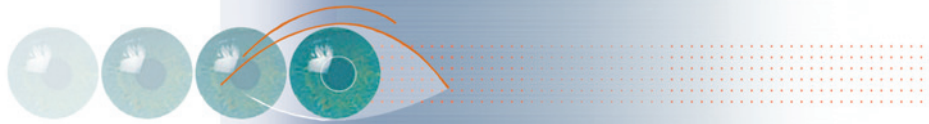
As with the CIS, this region falls within the remit of the EU’s Neighbourhood Policy. It is perhaps further along the road to some form of integration with the EU through the proposed Euro-Mediterranean Free Trade Zone, due to come into full force in 2010. The economies in this region are undergoing rapid changes, partly as a result of privatisation programmes, but also because of a recent influx of FDI, some of which is technologically rich. Political systems remain rather opaque, however, and are marked by extensive clientelism and secrecy. Research fields are dominated by the need to manage the harsh climate (and the opportunities this might offer), as well as resource extraction concerns.

**The main cooperation policy challenges associated with the region include:**

- funding INCO Preparatory Actions to leverage sources of Structural Funding;
- supporting triangulation initiatives with the whole of the African continent;
- meeting the significant challenges facing society;
- cooperating on mobility;
- engaging with emerging technologies.

**4. LATIN AMERICA (ARGENTINA, CHILE, COLOMBIA, AND VENEZUELA): TOWARDS A LATIN AMERICAN RESEARCH AREA**

The region has a long history of trying to wean itself off dependencies on the West, with economic policy from the 1950s to the 1980s dominated by import substitution, the building up of national champions, and the ambition to be self-sufficient in research and technology. The latter has led to the establishment of much of the RTDI infrastructure present today. While the austerity of the 1980s and 1990s saw much of the infrastructure eroded, the research areas being pursued remain wide-ranging – although much activity is associated with agriculture, medicine and the extractive industries.



**The main cooperation policy challenges associated with the region include:**

- changing European mindsets and perspectives on the potential of the Latin American region;
- promoting a ‘Latin Agenda’ by means of a coherent and supportive “knowledge diplomacy” necessary for mainstreaming social development, research and innovation at the regional level;
- encouraging and supporting institutional reform and consolidating research capabilities;
- making EU opportunities more accessible and increasing participation rates by the region’s scientists;
- supporting emerging sub-regional integration initiatives;
- promoting mutually beneficial RTDI cooperation with each country and the international organisations active in the region;
- promoting mutually beneficial cooperation between the EU and Latin America;
- achieving greater coordination of the existing horizontal EC programmes in Latin America.

**2. EMERGING SCIENCE AND TECHNOLOGY PRIORITIES IN PUBLIC RESEARCH POLICIES IN THE EU, THE US AND JAPAN**

*The study<sup>3</sup> provides a comparative overview of emerging scientific and technological developments in Europe and its main competitors – the United States and Japan – with an analysis of the socio-economic context in which they arise. By providing recommendations for public support to emerging science and technology priorities, the study aims to contribute to the development of the EU’s research and innovation policies.*

**FORTY EMERGING SCIENTIFIC AND TECHNOLOGICAL TECHNOLOGIES**

The study highlighted 40 key emerging technologies<sup>4</sup> in Europe, the United States and Japan, covering four priority fields: Nanotechnologies and New Materials, Information Society Technologies, Life Sciences and Technologies for Sustainable Development. The analysis of the 40 technologies shows that they have the strongest impact on the fields of Science & Technologies and Industry & Business.

**POSITIONING OF PUBLIC R&D IN EUROPE VIS A VIS THESE TECHNOLOGIES, COMPARED WITH JAPAN AND THE US**

Comparing public support for R&D and technology in Japan, the US and the EU, the analysis shows that the support is much more targeted on one or two fields in Japan and US than in Europe. In terms of technologies, the area of Life Sciences seems to get more support in Japan and the US than in Europe. The EU, meanwhile, seems to have a comparative advantage in terms of sustainable development technologies.

**Analysis of main socio-economic factors motivating policy support**

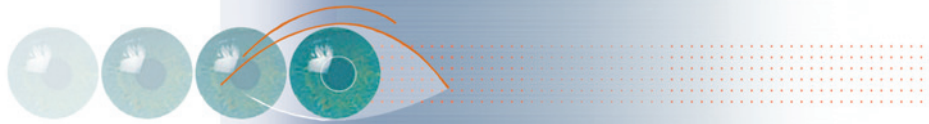
Economic factors provide the most important rationale impacting public R&D support policies in virtually all priority fields (with the partial exception of the field of Sustainable Development) and almost regardless of the geographical area. Of the three geographical areas in question, Europe is the region that is most strongly influenced by societal – that is, social and environmental – factors. As a matter of fact, issues regarding the environment and quality of life generally provide a unifying and defining element of European R&D support policy.

The European research landscape is characterised by important differences between the different countries. A number of factors account for this, such as countries’ GDP, their political environment, their scientific position, the relative importance of the defence sector, their industrial fabric, and so on.

Economic factors that impact on public financing of R&D policies are present in Europe, the US and Japan. However, Europe is faced with policy rigidities that have an important impact on the efficiency of public support, influencing both the form in which support is being administered and the organisation of research itself. Europe does not have any fully-fledged support mechanisms, and the key role of the environmental factor (with the precautionary principle) and the relative weakness of policy institutions at European level

<sup>3</sup> The study “Emerging science and technology priorities in public research policies of the European countries, the US and Japan has been carried out for the European countries (EU Member States, Associate and Candidate Countries), the US and Japan by a consortium led by CM International and comprising moreover ICTAF (Israel), VTT (Finland) and Z punkt (Germany). As to the analysis of Foresight studies in the US and Japan, the partnership contracted local teams: the Institute for Emerging Issues (North Carolina State University) and the Institute for Industrial Interchange (Tokyo).

<sup>4</sup> Biotechnologies, agro-food industry, health (36%); ICT (20%); Energy, environment (20%); Materials, chemistry, physics, electronics (15%); Construction, infrastructure (5%); Technologies for design, management and production (2%); Transport, aeronautics, space (2%).



seem to represent further obstacles to the creation of an efficient public support structure. Nevertheless, Europe occupies a significant scientific position on some technologies, such as “Ultra-thin functional coatings”, “Bioactive materials and surface” and “Nanocomposite and nanometrical-nanoscale reinforcements in electronics, chemistry, medicine”.

#### Identification of potential areas of leadership for Europe

- The field of Information Society technologies provides an important potential for Europe, particularly as regards the newly emerging health sector applications, which is not least due to the relative importance of societal factors in Europe.
- Sustainable Development is the field in which country-specific differences are most significant: there is no consensus about the technologies that are likely to promote this type of development (i.e. in the energy field: nuclear in France, solar in Germany and wind in Spain). Europe has a particularly strong interest in giving high priority to at least two technologies that could benefit from support for environmental factors: “Air-water purification” and “Renewable and recyclable materials”. And, while the significant delay in the “fuel cells” area is likely to constitute a serious hurdle for further growth potential, the present “biofuels” advantage needs to be confirmed and exploited intelligently.
- The field of Life Sciences constitutes the potentially most important research area. Taking into account the relative importance of social-environmental factors, Europe has the potential to occupy a leading role in the future scientific field of the life sciences.

#### RECOMMENDATIONS TO ENHANCE THE ROLE OF EUROPE IN R&D COMPETITION AND COOPERATION

Along with the proposed scenarios, different recommendations are made on how to enhance Europe’s position with regard to both the technologies and the role of Europe, in terms of R&D competition and cooperation.

Corrective strategies to prevent a decline of Europe’s S&T positioning in the eventuality of a failure of the EU Lisbon strategy could include: the development of a new “airbus strategy”, based on a key economic field in which Europe can, by the way of public and private partnerships, take the lead within 30 years; the fostering of R&D strategies and cooperation based on strong industrial-based technologies having an existing potential leadership such as “mobile communications”, “micro and nano-sensors” or “bio-fuels”; or the creation of the right conditions to attract foreign researchers in key technologies in which Europe (or a majority of European countries) seems to need competences.

#### Other specific actions could be:

- To establish a strong industrial European strategy as a basis for a R&D strategic policy linked with economic issues. As long as Europe does not have this strategy, R&D targeting on economic issues will depend on national will, environment and opportunities;
- To enhance the participation of SMEs – which constitute the basis of Europe’s industrial environment – in R&D projects;
- To strongly support access to venture capital for small research-intensive companies – through incentives, organisation, networks, pools, and so on – especially in the field of ICT, Life Sciences and nanotechnologies;
- To organise awareness-raising campaigns targeting the public at large in order to promote a better understanding of the potential applications of some key technologies, such as stem cells or protein engineering;
- To organise networking between scientific communities in order to foster convergence – particularly in nano-computers and microbotics applied to biology;
- To tackle issues at global level by fostering the large-scale dissemination of European results;
- To facilitate cooperation between research institutes and very small firms or associations through European research programs – groups of artists for research in virtual realities, artists and industries, and so on.

#### Two aspects are of particular interest both for R&D public policy decisions and foresight work:

- There are serious gaps in the positioning of different scientific fields and the role of public policies could therefore be dramatically modified. For each scientific field, the level of development and the process by which it has been reached are of crucial importance in assessing its future potential. The “converging” issue, emphasising convergence between scientific fields and between technologies, raises the importance of focusing on this approach and on the need for a better understanding of scientific realities and their determinants;
- The importance of socio-economic factors in explaining public policy decisions is obvious. But these factors and their evolution can represent major trends that can strongly impact on public actors in their decision-making abilities and opportunities. These factors, as trends, are not only part of the scenery for foresight practitioners, but could offer important potential for decision that could drastically change the scientific positioning of countries in a scientific field. Without minimising issues, such as budget or potential market, socio-economic factors could strongly support decision-making at political level and act as a rationale for choices and prioritisation.



### 3. USING FORESIGHT TO IMPROVE THE SCIENCE-POLICY RELATIONSHIP

*This project<sup>5</sup> formulated practical guidelines to optimise the policy contribution of Foresight at European level. As a first major application of these guidelines, the study attempted to design a European Foresight on European RTD policy in the area of transport, integrating the goal of sustainable development. This emphasis on RTD policy and sustainable development is central to Europe's vision of the future.*

#### PRACTICAL GUIDELINES FOR THE USE OF FORESIGHT IN THE EUROPEAN POLICY MAKING PROCESS

The absence of a systematic roadmap for firmly embedding Foresight in the policy-making process was the main motivation behind this initiative. The study formulated practical guidelines to optimise the policy contribution of Foresight at the European level and it shows the best way of implementing Foresight at national and European levels. In the last decade, significant changes have taken place in the science-policy relationship and these are taken into account to ensure that Foresight exercises are rooted in the context of contemporary policy. Rather than provide a comprehensive discussion of the selection of social scientific Foresight techniques and approaches, the study instead provides an account of the ways in which Foresight feeds into the policy process.

#### A DESIGN CASE ON “SUSTAINABLE MOBILITY” USED TO EVALUATE AND TEST THE PROPOSED GUIDELINES

As a first major application of these guidelines, a European Foresight on European RTD policy in the area of transport is proposed: it integrates a European and sustainable development component, along with expert feedback obtained by means of a web survey. It identifies a set of principles that, if followed, ensure that Foresight makes an effective contribution to policy development. A checklist to ensure the implementation of these principles was proposed for identifying and using S&T priorities. These are important in achieving the objective of sustainable development in the context of Foresight exercises.

Promoting the development of technological capabilities is the *raison d'être* of RTD policy and the core issue of the study. In order for RTD policies to contribute to sustainable development, they need to address societal issues beyond the traditional boundaries of particular sectors. One implication of

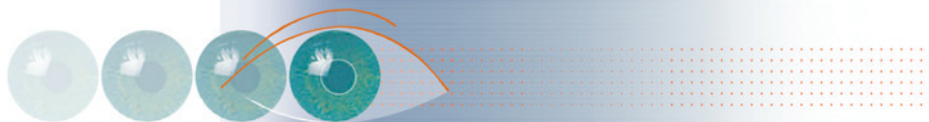
this is that, in the EU Member States, long-term planning can only be effective if the broader European context is taken into account.

#### CONCLUSIONS DERIVING FROM THE ROADMAP AND THE ANALYSIS

In a concluding session, specific issues addressing the European dimension of Foresight and the practical consequences of the presented principles and guidelines were raised:

- **It is both possible and useful to conduct Foresight studies at the level of the European Union:**  
Foresight exercises at regional or even national levels can be more instrumental in nature and have technological rather than societal orientations. They can even be aimed specifically at investment planning. European Foresight must be more informative in nature, focusing on influencing policy-thinking rather than policy-making. The European Foresight exercise must overcome barriers due to the differences in culture within Europe; consensus and cooperation may also prove more difficult at the European level.
- **Maintain Foresight at multiple levels:**  
Any Foresight exercise needs to be aware of multiple levels: just like at European-level, Foresight must cater for cultural and national differences, so a national or regional Foresight must take into account Europe-wide considerations. The commitment of the European Union means that internal competition must be managed so that, in the long run, the society as a whole benefits.
- **Foresight must not be purely academic:**  
The success of Foresight exercises should be measured by analysing what occurred after completion of the exercise. Because implementation is so critical, post-exercise planning must be part of the original design of the exercise, its conduct, and its evaluation.

<sup>5</sup> “Improving the science/policy relationship with the help of Foresight: a European perspective” (contractor: RAND Europe/NL).



## Forthcoming Foresight events

### EUROPEAN FORUM ON NANOSCIENCES: A CONVERGING APPROACH ACROSS DISCIPLINES 19-20 OCTOBER 2006, BRUSSELS

The field of nanosciences is now advancing rapidly thanks to the strong synergy among disciplines, with increased connections with biotechnology and biomedicine, information technology and computing science, as well as with cognitive science and cognitive neuroscience. The “European Forum on Nanosciences” aims to explore the wide range of new possibilities, underlining the international and interdisciplinary character of this field.

The event is organised by COST (European Cooperation in the field of Scientific and Technical Research), with the support of the European Commission (EC), the European Parliament / Scientific Technology Options Assessment (EP/STOA), the European Science Foundation (ESF), and the ERA-NET Consortium on Nanoscience in the European Research Area (NanoSci-ERA).

The target audience comprises researchers working in nanosciences, scientists operating in multidisciplinary environments, politicians, policy- and decision-makers in public and private research, representatives of funding agencies for research and technology, representatives of education and training institutions, journalists, stakeholders from industry, as well as representatives from the civil society.

Four thematic sessions will integrate recent scientific achievements as well as societal and environmental aspects:

- **Session 1**  
*How can nano-scale research improve the quality of life?*
- **Session 2**  
*Will future energy problems be powered on nano-scale?*
- **Session 3**  
*How will converging nanosciences transform the information society?*
- **Session 4**  
*Sharpening the cutting edge of nanoscience: how to structure the research community?*

A round table discussion will take place on “The converging approach and nanoscience: what’s new, where to proceed in education, research and industrial application?”.

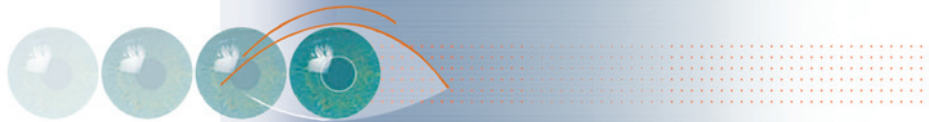
*For more information and registration, visit the forum website at [www.cost.esf.org/nanosciences](http://www.cost.esf.org/nanosciences)*

### A NEW REPORT “EUROPEAN RESEARCH OUTLOOK 2006” IS BEING PREPARED BY DG RESEARCH AND IS EXPECTED TO BE ISSUED BY THE END OF THE YEAR

Emerging economies such as China and India will reshape the world economy over the coming decades. An expanding global economy and rising population will challenge our planet in terms of the environment, and will also increase the demand for energy, food and water. In addition, the expanding global economic and cultural divide increases the threat of political instability, conflicts and terrorism. These changes will affect an ageing Europe in future years; research and technology will be part of the response to these challenges.

The report “Europe in the changing geography of research - Trends and perspectives” will review current and prospective technological capacities in different world regions. It will study Europe and its main competitors’ positions in RTD, with particular attention on newly emerging economies and technologies. Their impact on Europe’s (and the world’s) critical societal challenges of today and tomorrow will be highlighted. The report concludes that Europe has a comfortable RTD position in the world, but warns against complacency. Europe needs to open up to the rest of the world in order not to miss the technological opportunities arising outside its borders.

The results of the work of the expert group “The future of key research actors in the ERA”, as well as the prospective studies of the S&T Knowledge Sharing Platform, will contribute to the production of the “European Research Outlook 2006” report.



## Announcements

### THE FOR-LEARN QUERY SYSTEM IS NOW ONLINE TOGETHER WITH THE FORESIGHT GUIDE

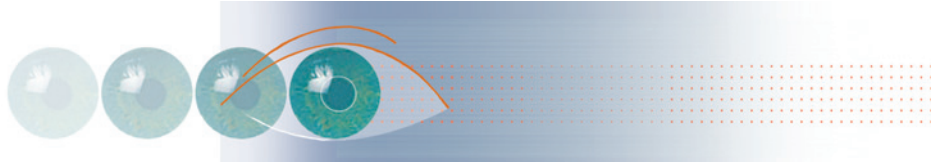
Despite all the experience gathered within the framework of Foresight over the last twenty years, newcomers sometimes still find it difficult to access the available knowledge. The **online Foresight guide** is a dynamic tool that makes information on Foresight more comprehensible and accessible to a wider public. It is aimed at practitioners of Foresight, as well as at all policy-makers and administrators willing to launch a Foresight activity. It provides users with clear guidelines on the various stages and necessary steps to design and carry out a Foresight exercise and first level support to practitioners. Another tool labelled the **'query system'** is now online and continuously offers individually targeted support to people who use Foresight by answering individual queries or refer them to other sources and contacts.

*For more information on the FOR-LEARN project, contact [fabiana.scapolo@ec.europa.eu](mailto:fabiana.scapolo@ec.europa.eu)*

### THREE PROSPECTIVE STUDIES BELONGING TO THE "EUROPEAN SCIENCE AND TECHNOLOGY FORESIGHT KNOWLEDGE SHARING PLATFORM" ARE BEING PUBLISHED

- "Emerging S&T priorities in public research policies in the EU, the US and Japan" (EUR 21960)
- "Scenarios for future S&T developments in developing countries SCOPE 2015" (EUR 21965)
- "Using foresight to improve the science-policy relationship" (EUR 21967)

*These publications will be available at the address <http://cordis.europa.eu/foresight/>*



## “Foresighting Europe” Newsletter

The newsletter “Foresighting Europe” is prepared by the Science and Technology Foresight Unit of DG Research. It undertakes its mission within Directorate K ‘Social Sciences and Humanities; Foresight’, in cooperation with the JRC/IPTS as well as national and international Foresight institutions:

- Promoting cooperation in European Foresight
- Monitoring and exploiting Foresight, informing European research policy developments and contributing to policy thinking in DG Research
- Implementing S&T Foresight activities under the ‘Support for the coherent development of S&T policies’ in FP6
- Promoting Foresight dissemination and experience sharing
- Preparing Foresight activities in FP7
- Preparing the Outlook Foresight Report for 2006

It also promotes results dissemination and experience sharing on the basis of the activities that have been carried out.

- Information on the foresight activities of DG Research: <http://www.cordis.lu/foresight/home.html>
- Information on STRATA: <http://www.cordis.lu/improving/strata/strata.htm>
- Information on DG Research’s initiatives: [http://ec.europa.eu/research/index\\_en.cfm](http://ec.europa.eu/research/index_en.cfm)
- Information on the JRC/IPTS’s activities: <http://www.jrc.es/welcome.html>

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### RECENT PUBLICATIONS

- Deliberating Foresight knowledge for policy and foresight knowledge assessment (EUR 21957);
- Creative system disruption towards a research strategy beyond Lisbon, a report from the expert group ‘Key technologies for the future’ (EUR 26968);
- Converging Technologies: Shaping the Future of European Societies, a report from the High Level Expert Group ‘Foresighting the New Technology Wave’ (EUR 21357);
- Foresight and the transition to regional knowledge based economies, a synthesis report of the expert group ‘Blueprint for Foresight actions in the regions’ (EUR 21262);
- Policy orientation report of the expert group “Blueprint for foresight actions in the regions” (EUR 21355);
- Future of Creative Industries: implications for Research Policy, working paper (EUR 21471);
- Measures to improve Higher Education/Research Relations in order to strengthen the strategic basis of the ERA (EUR 20905).

The full list of publications (electronic versions) can also be downloaded from the address:  
<http://cordis.europa.eu/foresight/reports.htm>