A window on the European Commission

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The Future of Science & Technology in the European Union

In 2000, the European Council met in Lisbon and set the EU an ambitious goal; Europe was to become "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".
Two years later in Barcelona they set out to increase the average level of expenditure on R&D to 3% of GDP by 2010 on the basis that scientific research, technological development and innovation are at the heart of the knowledge based economy. This increase in funding would support the goal of building a European Research Area equivalent of the "common market" for goods and services. It aims to regroup all Community supports for the better coordination of research activities and the convergence of research and innovation policies, at national and EU levels. In order to reach this goal, the EU's R&D expenditure will have to rise by 8% per year (6% from public investment and 9% from private investment) To carry out this research, Europe will need over 1.2mn research personnel including more than 700,000 researchers.

Currently, the EU spends 1.9% of its GDP on research, whereas the US spends about 2.7% and Japan 3%. In absolute terms, the US spends €125bn a year more on research than the EU, despite the fact that the EU has a larger population. What is surprising is that public R & D expenditure, expressed as a percentage of GDP, is roughly equal in Japan, the US, and the EU. On the other hand, European industry spends much less on research and development than its US and Japanese counterparts. More often than not there are no highly innovative small and medium-sized enterprises, which in the US in particular have frequently been and still are powerhouses of innovation.
In its budget proposal for 2007-2013, the European Commission set three goals:

- Completing the internal market to achieve the broader objective of sustainable development
- Completing the Area of Freedom Justice Security and access to basic public goods
- Projecting Europe as a Global Partner

RTD falls under the first objective and the European Commission proposed increasing the European Union's research funding to an average of €10 billion a year for the duration of the next framework programme, i.e. twice as much as today, and to devote it to six major objectives, including the creation of European centres of excellence, the launching of technology initiatives in industrial fields of growth and the creation of a European "agency" to support European basic research teams. In its strategy document entitled "Science and technology, the key to Europe's future" (COM.2004.353) the Commission aims to provide a concrete response to the objectives of the Lisbon strategy and to support the European Research Area project. The Commission also proposes focusing future European efforts on key topics, including security and space.

The six major objectives are as follows:

- to create European centres of excellence by means of collaboration between laboratories
- to launch technological initiatives on an EU scale in promising industrial sectors by creating joint undertakings
- to boost the creativity of basic research by means of competition between individual teams at European level
- to make Europe more attractive to the best researchers by increasing support for them
- to develop research infrastructures of European interest based on the example of the trans-European networks
- to strengthen coordination between national research programmes.

The creation of Centres of Excellence aims to increase the collaboration between research centres, universities and private industry bringing together basic and applied research using a multidisciplinary approach. The Networks and Integrated Projects built under FP6 will form the basis for these Centres of Excellence

Europe lacks the capacity to transform knowledge into products and services. European companies apply for 170 patents per year per million inhabitants compared with 400 for American companies. It is hoped that the creation of Technological Platforms will bring together industry, research establishments, financial institutions and regulatory authorities at a European level to mobilise "a critical mass" of national, European, public and private resources. Particular areas for these platforms will be energy, transport, nano-electronics.

Basic research is recognised as having an increasing impact on economic performance and needs to be stimulated in Europe. An Expert Group (European Research Council Expert Group (ERCEG) was set up in 2002 to discuss the purpose and scope of such a body. The Group recommended that a European Fund for Research Excellence be established and that a European Research Council be established to manage the Fund. According to the report summary "the first and main task for the ERC should be to support investigator driven research of the highest quality selected through European competition…The ERC should primarily be a funding body for basic research and should cover all fields of science and humanities…"

In 2003 the Commission issued a communication entitled "Researchers in the European Research Area, One Profession, Multiple Careers (COM.436.2003)". The report pointed out that human resources underpin research excellence and output and that although mobility is a key aspect of improving research excellence, one other aspect, often overlooked is the way in which researcher professions and careers are structured. The Commission has stated its objective is to promote the development of European scientific careers and ensure that both European and international researchers see Europe as the ultimate destination to enhance their career. To do this it is necessary to strengthen the existing "Marie Curie" actions by increasing the funding (currently, under FP6 funding for Marie Curie for the period 2002-2006 is EUR1.58bn – FP7 thinking is to double this amount); focus on attracting young people to science; improving the role and place of women in science and research; improving the transfer of knowledge in particular to the technologically least advance regions and for Small and Medium Enterprises; improving the international dimension

of training and mobility and improve the structure and development of researcher careers.

Infrastructures play a fundamental role in European research. The mission of the European Strategy Forum on Research Infrastructures (ESFRI) set up in 2002 by the Member States of the Union on the initiative of the Commission is to provide a multidisciplinary platform open to all EU countries to monitor the needs expressed by the scientific community. Europe has had outstanding successes in the past in terms of a collective approach to planning, constructing and operating major research infrastructures, vis. CERN (European Organisation for Nuclear Research), ESA (European Space Agency), ESO (European Southern Observatory), EMBL (European Molecular Biology Laboratory) etc. However, the increasing numbers of disciplines, types of infrastructures required, potential partners (private sector, candidate countries) etc have made it more and more difficult to deal with this subject at European level. The choices between maintaining or closing down, improving research infrastructures or creating new ones, have become increasingly complex. In its proposal for FP7 the Commission recommend strengthening the support for construction and operation of new infrastructures of European interest. This approach would apply also to the GEANT project for the interconnection of electronic research networks and the GRID architecture, as well as electronic archiving systems for scientific publications and bioinformatics databases.

Under FP6 the ERA-NET scheme was set up to improve and increase the cooperation and coordination of research activities carried out at national or regional level in the Member States and Associated States through:
the networking of research activities conducted at national or regional level, and
the mutual opening of national and regional research programmes.

In FP7 the Commission recommends strengthening these efforts by increasing the resources allocated to the ERA-NET activities. (The budget for this project under FP6 was EUR148mn) Under FP6 also, the EU's participation in national programmes was carried out under Article 169 of the Treaty which made provision for such activities. The example of this is the EDCTP (European and Developing Countries Clinical Trials Partnership) The EDCTP is a research programme for the development of new medical products, microbicides and vaccines to fight HIV/AIDS, malaria and tuberculosis targeted at sub-Saharan Africa. It focuses on phase II/III clinical trials for the 3 diseases and is tailored to the specific needs of Developing Countries. The EDCTP target budget is € 600 million for the period 2003 - 2007. Apart from the 200 million from the Community, 200 million will come from Member States' national activities, and further € 200 million will come from industry, charity and private organisations. The lessons from this project will be used to strengthen and improve this facet of integration with Member State programmes.

One other area targeted by the Commission in their proposal was to take full advantage of the complementarity offered through the Structural Funds and to increase the combined use of these funds and RTD funds. Part of the EC's structural funds is allocated to supporting the development of research capability.

In its proposal, the Commission targets two new areas for particular attention – space and security. In terms of Space policy, there is currently an agreement on cooperation between the European Commission and the European Space Agency (ESA). In

future, it is foreseen that a European Space Programme will be created with research activities focussing on technologies for the exploitation of space, in the areas of navigation (i.e. Galileo project) global monitoring for environment and security (GMES) and satellite telecommunications as well as space transport technology and utilisation of the International Space Station.

Security is a major global challenge and one that Europe is taking very seriously. Security is an issue at an individual and State level as well as in terms of transport and telecommunications networks and bio-terrorism. In March this year, the Commission launched a three year "Preparatory Action on Enhancement of the European industrial potential in the field of Security Research 2004-2006" with a budget of EUR40mn. The action focuses in particular on the development of a security research agenda to bridge the gap between civil research (supported by EC Framework Programmes) and national and intergovernmental defence programmes. The Commission now recommends that this programme be strengthened with additional resources to carry out increased public security as well as helping the European Union fulfil its task of preserving peace preventing conflict and strengthening international security in keeping with the principles of the UN Charter.

The Commission has also taken note of the recommendations under the recent Marimon Report on FP6, and FP7 should see simpler, more streamlined processes.

The response to the first calls for proposals under FP6 was overwhelming with over 28,000 research proposals having been submitted, involving 150,000 institutions in over 50 countries and over 200 major transnational research networks and projects have been launched. However, the downside is that the programme is hugely oversubscribed with only 1 proposal in 5 being able to be supported due to the lack of funds. The Commission hopes that greater resources and clearer organisation around the six objectives listed above will alleviate the oversubscription problem.

Research is to an ever greater extent becoming a tool of foreign policy. The EU's participation and commitment in international initiatives often has research implications in order to meet those commitments. This is especially so in the area of environment and security. Research is also becoming more and more expensive. Over the last 20 years, the cost of developing a drug has more than doubled and that of a new microelectronic component has increased ten-fold. Research needs are global and cannot be met by single countries alone. The European Added Value which stems from the Union's Framework Programmes is at work on several levels – creating critical mass of resources, strengthening transnational collaboration, improving coordination of Member State activities as well as providing leverage on private investment in research. The proposed FP7 framework will build on the above and increase their effectiveness.

The Commission's proposal has been open for international consultation and comment for some time and the Expert Panel working on the five year assessment of EU research will present its report to the Commission by November 2004. The Competitiveness Council will debate FP7 at its meeting in late November and an official proposal for the 7th Framework Programme on Research and Technological Development is planned for early 2005.

The new Commissioner Designate for Research, Janez Potocnik has put at the top of his wish list of initiatives, the doubling of the EU Budget for Research. Lets hope he gets his way and we can at last see a Framework Programme that has the resources to achieve its objectives. As one quote so aptly put it, a vision without money is only a hallucination!

References:

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