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**EUROPEAN RESEARCH ADVISORY BOARD
FINAL REPORT**

**The Financial Perspective for
Framework Programme 7
and Criteria for the Selection of
Topics for the Work Programmes**

10 May 2005

1. Recommendations

EURAB sees a doubling of the research budget for Framework Programme 7 (FP7) as an absolute minimum target to accomplish the challenges for European Research.

The arguments for this are:

- The redefined Lisbon vision to transform the European Union into “the most competitive and dynamic knowledge based economy in the world” with the focus on growth and employment cannot be realised without a massive investment in European Research, Technology and Development (RTD).
- Research money spent on the European level by the EU has a proven leverage effect on national and private R&D investment. It stimulates both collaboration and competition and has a positive effect on the overall quality of nationally funded research. In particular it can help create a research-friendly environment, allowing achieving a critical mass in many research fields, causing the attraction of top researchers of the world and reversing the brain-drain.
- Due to a mere lack of funds the success rate of present European research programmes are so low that many high quality proposals cannot be funded. These missed opportunities for Europe need to be decreased.
- All regions of the European Union, now enlarged with new member states, must have access to and benefit from the results of research. Research and education are important parts of a European cohesion strategy, and without further investment the differences in socio-economic conditions within the European Union will only increase.
- In many research fields inherent scientific developments have led to an increased need of medium- and large scale facilities and equipment, exceeding what can be financed on a national level and thus requiring European co-funding and international access.
- Research is key to a number of new tasks and challenges of the European Union as mentioned in the proposed Constitutional Treaty. New initiatives such as a European Research Council, Joint Technology Initiatives and an increase of research efforts in fields such as environmental protection, healthcare, security, space and social sciences and humanities are important parts of the European vision and supported by EU policies. They are highly dependent on investment and coordination on a European level.
- Globalisation and increasing competition on knowledge creation from countries with a much more favourable demographic development than many European countries with their aging populations increase the need for more investment of strategic nature in RTD on the European level. Attractive conditions for mobility and a competitive research environment on a European level are needed for attracting the world’s best researchers to Europe.
- An increased FP7 research budget has an added value on European scale which makes it much more urgent compared to the general need for increased national investment in Research and Development (R&D). An increased investment in European RTD should however not be negatively compensated by a reduction of

national research budgets, but rather be seen as an incitement for concomitant increase in national and private R&D investment

In support of these arguments and in order to ensure the best use of resources in the coming Framework Programme, EURAB is suggesting the following general criteria for the selection of topics for the work programmes of the thematic priorities of FP.

2. General criteria for the selection of topics for the work programmes of the thematic priorities in FP7.

EURAB is suggesting the following criteria:

2.1 Building on the European research potential

For the topics within the thematic domains there should be a strong potential for excellent research and technological development and for disseminating and converting the results into social and economic benefits. Future research should, whenever possible, build on existing competences and successes in relevant areas of research and its application.

The assessment of this criterion can be done through the evaluation of European research and industrial performance, through the evaluation of past performances of members of Technology Platforms and the Strategic Research Agenda of the Technology platforms, and through general views from the research community and the industry.

2.2 Excellence and/or innovation potential

The topics within the thematic domains should be chosen with the knowledge that Europe has the potential to excel in those domains, and that the innovation potential is such that it will progress the development of Europe and its citizens. The size of the projects should be such that excellence can be achieved with the means made available.

This criterion should be assessed through the review of proposals in comparison with world-wide similar efforts (benchmarking), by evaluation of the innovative character by reviewers including representatives from both the research and industrial communities; and by making sure that the entire roadmap leading to the innovation is being assessed and supported.

2.3 Novelty and allowing for risk taking

The research topics within the thematic domains supported by the European Union should be future-oriented and should thereby carry some risk as a result of their novelty. In the translation to a knowledge-based society the topics should be breaking new ground while capitalising on European competencies.

The assessment of this criterion should be mostly done through the analysis of vision papers and foresight exercises of the scientific world, through the analysis of the desirable profile of the European industry, through views of the research community and society.

In order to be efficient, EURAB is in favour both of topics that build on the results achieved by the Framework Programme 6 and of those in new and emerging domains (including the two new areas of space and security and of social sciences and humanities).

2.4 Potential for future strategic or trans-national application

The topics within the thematic domains should have a potential for future strategic or trans-national application, which make the projects result-oriented. They should interact with other stages in the path to bringing knowledge into practice (basic research, research, prototype work and industrial launch or introduction in the society). The contribution of the outcome of the projects to industrial innovation and societal benefit should be made clear.

The assessment can be done by analyzing the programmes of the European Union, and by taking into account the views of the scientific and industrial world, including the Technology Platforms.

2.5 European added value

European added value can be achieved whenever there is a need for an intervention at the European level which cannot be done cheaper, better and faster at the national level. This can be said when there is an aim:

- To attract increased public and private investments on a wider scale.
- To create the necessary multi-disciplinarity and critical mass of scale and scope, allowing competition on a world-wide scale.
- To overcome fragmentation and unnecessary duplication.
- To complement other intergovernmental national and private actions.

The assessment can be done through the analysis of impact of support by the European Union in comparison with other major countries and economies and through the views from the research community and the industry, more specifically in the Strategic Research Agenda, established by Technology Platforms.

2.6 Support and development of EU policy objectives.

The goal is to generate new knowledge which can make a contribution to European policy objectives. This definitely includes the objective to transform Europe into a dynamic and competitive knowledge-based economy, capable of sustainable growth. The topic may be one of current importance or likely to become important in the medium to long term.

The assessment of this criterion can be done through the translation of policy commitments into action plans, through the analysis of prospects and competitive position of EU industries, through the future needs identified in technological road mapping or strategy exercises, or through views from the research community and industry. Such themes should be result oriented.

2.7 European and global challenges

A number of world-wide and/or European problems, where Europe can make a valuable contribution through science and technology or that demand a global approach because of the complexity of the subjects.

This criterion will be assessed through the analysis of vision papers of the EU and of the scientific and industrial world; through commitments of policy deployment or political topical matters.

2.8 Sustainability

Sustainability is not only referring to natural resources or environmental aspects of research and technology applications, but also to social and ethical criteria for development of research.

The assessment of these criteria will take into account the European Union's policy on environment, energy and development of cleaner technologies. It will also apply to European institutions and advisory bodies on ethical and social issues, and national law and to regulation in the Member Countries of the European Union.

In addition to and in support of the before-indicated arguments for the financial perspective of the Framework 7 programme and of the criteria for selection of the topics for the work programmes EURAB wants to point out the following

Challenges for European research

The economic challenge

The former President of the European Union, Romano Prodi, asked a group of economists led by André Sapir to write a report on the economic perspectives of Europe beyond 2007. In this report, André Sapir et al. pointed out that the most important priority of Europe must be growth as the sine qua non condition for the sustainability of the social model, the success of enlargement, and the cohesion and the stability of Europe. The basis for growth is investment in research & development, education and infrastructure. Even with a 1% ceiling of the overall framework budget, the report recommends an increase in the research budget by six times.

Taking the recommendations from the Sapir et al. into consideration, it gives reason to worry that the European Union in a recent OECD report shows underperformance compared to non-EU countries. The high-tech trade underperformance is estimated by OECD to be 33.5 Billion €. Furthermore the estimated potential economic growth for EU is adjusted downwards from 3% to 2% to 1% since the Lisbon vision was launched in 2000. The employment rate in the EU vs. in the US has decreased from 95.2% (1970) to 78.2% (2000), and the number of hours worked annually per employee is lower in the EU than in the USA.

If no doubling of the FP budget will occur and without a reduction in national R&D budgets, these trends will only be corroborated. There are more arguments for at least a doubling of the Framework Programme budget:

- RTD in general and the Framework Programme in particular contribute to economic growth and employment creation and raise competitiveness.
- It is a source of new useful information.
- It offers industry more talent and skilled researchers.
- It is a source of new instrumentation and methodologies.
- It provides access to networks of experts and information.
- It gives the ability to solve complex technical problems.
- It forms a basis for spin-off companies.

The global challenge

Today's challenges are global and not restricted to the national level. Problems related to climate, energy and environment cross national borders. Politics around social and economical issues are today discussed in international fora, and threats to health and life quality cannot any longer be seen from a purely national perspective. The globalisation of the economy has further enhanced the international character of industrial activities and innovation.

The creation of new knowledge to address the global challenges will require a multi-facetted expertise and competence not often found in one single institution or country. Europe's knowledge base can therefore not only be founded on national research efforts. Furthermore, European funding has (in the Lisbon/Barcelona spirit) to be increased to meet the challenges from the USA and Japan, as well as from the rapidly emerging economies in Asia and some other parts of the world. The new trends of outsourcing administration and computer software development to low-income countries may soon also be a reality for research. Countries such

as China, India and Korea are investing massively in higher education and knowledge and are already very competitive.

The demographic challenge

Europe has a problematic demographic profile in which a decreasing working generation has to sustain an increasing ageing population. The “demographic triangle” is in contrast to several other parts of the world turned upside down. As a consequence, European innovation and efficiency needs to be at a higher level than those in other parts of the world, including the USA, to maintain economic competitiveness and to meet the demands of the health care system. Thus, Europe should not only aspire to reach the level of US research funding, but even try to exceed it.

The health challenge

With an aging population comes also an increased demand for extended medical care. With the completion of the Human Genome Project, medicine is about to enter a new era of earlier diagnosis, more individual treatment, better prevention of diseases and maybe new types of treatment..

The European cohesion challenge

A condition for increasing the European competitiveness is a stronger cohesion between countries, regions, and also within our societies. In particular with the expansion of the EU, an upgrading will be necessary of national knowledge and levels of research infrastructure for newly accessed member states in synergy with the structural funds to enhance growth and employment and to guarantee the European cohesion.

The European culture challenge

The concept of European Cultural Heritage in the context of the enlarged European Union could also be a key focus for a new research effort to explore its meaning in Europe’s growing and diversified multi-ethnic societies. Europe has a rich and diverse culture and a multitude of languages are spoken in the European countries. Cultural identity of the European citizen needs to be better understood in an open European market with increased migration and trans-national collaboration. In an increasingly interdependent world the concept of European Cultural Heritage should also address the relationship between Europe and the rest of the world. Culture is an important factor for life quality and peaceful development, and the humanities and social sciences can contribute with important knowledge on how to nourish and sustain the European culture without destroying the diversity. Insight into the historical processes behind cultural differences and into the mechanisms creating conflict or harmony would be beneficial in informing future European Union policy. Understanding culture, language and society is a key factor for more security and to solve religious, cultural and social conflicts.

What will be the impact of an increased research funding in Framework Programme 7?

Proper support needed for EU policies

Several reports (Kok, Sapir) indicate that Europe needs to invest more in development of new technologies and in education. Europe is losing momentum in economic growth due to lack of investment in these areas. Public research and development is a key factor in creating a healthy climate for private investments and eventually for competitiveness, employment creation, economic growth and stability. If these goals are to be achieved a doubling of the annual research budget in the next framework programme may even be a modest change.

Increased dissemination of knowledge and results

European researchers and research institutions are still to a large extent dependent on national funding programmes. More collaboration and increased competition on a European level will lead to higher quality and better use of resources spent on research.

The European Research Area is still far from a reality and will only be accomplished with more funding at the European level as an incentive for collaboration. More investment in research at the European level will also help create a more attractive environment for private investment, more mobility of researchers and a rise above a critical mass which will be the incentive for knowledge-dependent enterprises to establish their business in Europe.

Differentiated instruments to cover the different needs e.g.: R&D Infrastructures

Due to their extended scale and costs large scale research facilities depend heavily on inter-governmental political engagement which is within the sphere of interest, but generally beyond the potential of most national research programmes. Today the need for collaboration on big infrastructure projects has spread to all sciences as well as social sciences and humanities (cf. EURAB's earlier recommendations on "Infrastructures" and "ERA and the Social Sciences and Humanities"). Better coordination will make Europe more competitive and pave the way for establishment of urgently needed instruments and better networking of research facilities in Europe.

Smaller to medium scale research infrastructure projects, and their trans-national sharing, pooling and networking will be facilitated by collaboration and common investment in FP7 and will play an important role for researchers' access to facilities which currently are restricted to relatively few research groups.

The European Research Council (ERC)

New activities are introduced in FP7 and their success will be highly dependent on sufficient funding. A European Research Council with focus on basic frontier research will be an important new European institution. Basic research has become a target, especially in emerging sectors of science and technology. The lack of a European mechanism to support fundamental research has for a long time been a handicap in very competitive areas where USA and Japan have been able to mobilise environments with high quality research with very short notice. An ERC encompassing all disciplines (including the humanities and social sciences) will act as a spearhead for a much needed institutional reform, not the least as a necessary element of the European Research Area.

New European research activities, security and space

Security research and space exploration are new focus areas specifically mentioned in the proposed EU Constitutional Treaty and these areas create a need for extra funding in the next Framework Programme in order to fulfil the objectives. A number of areas in the

proposed Constitutional Treaty, like energy, environment and culture also emphasize research and development as necessary tools for support of the objectives.

Integration of new member states

The new member states represent a huge amount of human resources and talent to be nourished and given opportunities for economic growth. Research represents a prospect for social development and opportunities for young people. Integration of research and education is an important part of the assimilation process and is a benefit not only for the new member states but also for the rest of Europe.

Reduction of costs and sustainable production

Investment in research is not only supporting new products and economic growth. It also improves the long term budgets in other areas and permits cost reduction for the benefit of society. Research is an important basis for the creation of more environmentally sustainable production methods, cleaner technologies, clean and low consumption cars and transport systems, new and better utilisation of energy, more effective health care systems, cheaper communication technologies etc.

Lower costs and sustainable utilisation of resources is an important part of the political agenda, not only in Europe, but also the in rest of the world. Europe has for a long time been strong in competition on cheaper and cleaner technologies and may remain in a leading position by further investments in these areas.