

EUROPEAN RESEARCH AREA BOARD

Towards a Common Strategic Framework for Research and Innovation: ERAB Views and Recommendations

ERAB's contribution to the Common Strategic Framework consultation

ERAB has produced extensive advice and recommendations to support the Common Strategic Framework consultation. These documents are attached herein.

From this follows the following key recommendations:

- 1- Be ambitious and be prepared to take managed risks for the sake of the European economy.
- 2- Concentrate funding on a selection of high-impact research themes driven by key societal challenges, whereby Member States and the European Commission would agree on a common approach and joint support mechanisms to move forward (e.g. SET-plan and Active and Healthy Ageing Innovation Partnerships).
- 3- Create a more efficient mechanism that would facilitate pooling Member State resources.
- 4- Encourage Member States to harmonise support structures between themselves to increase the impact of research and innovation across Europe.
- 5- Support high-risk, high-gain excellence frontier research (continue and increase ERC funding to this end).
- 6- Extend ERC model to support Future Emerging Technologies for which there may not exist apparent market at first.
- 7- Integrate all EC support mechanisms to focus on key challenges and create a common approach between different Directorate-Generals of the Commission.
- 8- Encourage specific mechanisms to support less performing countries or regions in their research and innovation efforts.
- 9- Use Structural and other funds constructively to support cutting edge research linked to solving societal challenges in all areas including health and secure food supply.
- 10- Divide support between curiosity and mission-driven. The latter to include both high risk enabling technologies and further support for European competitiveness.
- 11- Develop ways of supporting excellent research management in all sectors, more specifically when associated with the Grand Challenges.
- 12- Create a number of independent arms length funding agencies to support and govern different types of excellent research and innovation. The agencies should be funded on the long term and be legally allowed to make long-term commitments (e.g., ERC for basic, curiosity driven research, a similar institutional setting (agency) to support industrial and applied research, mobility, research infrastructures, etc).

- 13- Better support near-market research and innovation (e.g., demonstrations and pilots).
- 14- Revise and agree on State Aid rules to further encourage innovation.
- 15- Incentivise and encourage higher mobility at all levels including mid-career mobility between private and public institutions.
- 16- The European Commission should pursue the creation of a global forum to agree actions pertinent to global research and investment.
- 17- The Commission should be mandated to act on behalf of the Member States at such a forum.

ERAB produced the following documents to advise the Commission during the past two years and should be consulted for any further specific recommendations. Many of the themes are subject to further detailed studies which will allow for fine tuning the recommendations.

- Preparing Europe for a New Renaissance: A Strategic View of the European Research Area (October 2009)
 - Realising the New Renaissance: Policy Proposal for Developing a World-class Research and Innovation Space in Europe 2030 (October 2010), including the 2030 ERAB Milestones (May 2010)
 - Towards a Common Strategic Framework for the EU Research and Innovation: ERAB Views and Recommendations (May 2011)
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- ERAB 10 Key Recommendations (June 2010)
 - ERAB View on the Contribution of FP7 Instruments to the Establishment of a Genuine European Research Area (February 2009)
 - ERAB View on the Communication “Simplifying the implementation of the Research Framework Programmes” (May 2010)
 - ERAB View on the Role of Public Procurement for the R&I Strategy (April 2010)
 - ERAB View on the Role of Venture Capital for the R&I Strategy (April 2010)
 - ERAB View on Achieving Cohesion in European Research and Innovation (July 2010; update April 2011).
 - ERAB Recommendation to Maximize High Risk – High Gain Research in the Next Framework Program (December 2010)
 - ERAB View on Social Innovation (April 2011)
 - ERAB View on the Role of International Collaborations (April 2011)

1. Introduction

The Green Paper *"Towards a Common Strategic Framework for EU Research and Innovation Funding"* published in February 2011 by the European Commission (EC), launched a public debate on key issues to be addressed in future EU research and innovation (R&I) funding schemes for the next multi-annual Financial Framework. The ratification of the Lisbon Treaty (TFEU) together with the new financial perspectives would allow for proper tools to be identified so as to build an effective European Research Area (ERA). Financial constraints would be taken into account, both at Member State (MS) and EU levels.

The EU 2020 strategy (*"A European Strategy for Smart, Sustainable and Inclusive Growth"*) and its Flagship Initiative *"Innovation Union"* provide a general direction. The strategies and policies within R&I, which will be proposed by the EC, will be extremely important for implementing policy. A Common Strategic Framework (CSF) approval by the Council and the Parliament will set a common direction for the joint efforts of all MS.

The European Research Area Board (ERAB) welcomes the opportunity to present its vision of the Common Strategic Framework (CSF) architecture. ERAB's recommendations are based on its past work as advisory board (2008-2011) and particularly on its two published reports, *"Preparing Europe for a New Renaissance"* (2009) and *"Realising the New Renaissance"* (2010).

The second ERAB Report states clearly: *«The prospect of what might happen if we don't act immediately is economic and social decline in Europe and further environmental degradation»* (ERAB, 2010). ERAB believes that unless there is a drastic change in how the CSF operates, Europe's ability to compete or cooperate globally will significantly diminish. Therefore, ERAB urges the decision making bodies in Europe to consider this a priority and it welcomes the CSF proposal as an important step to a new and more efficient R&I policy.

ERAB's recommendations are ambitious both in scope and budget. It is essential that the full resources of Member States and within the Commission are focused and utilised efficiently rather than being divided up into, often, competing and small scale programmes.

2. Implementing existing Framework Programmes

Maintaining the European standard of living will be challenging as other world economies emerge and there is further pressure on scarce resources which has been recognised in the context of achieving the European Research Area (ERA). Building ERA will require a more efficient investment in research and innovation at the EU level to avoid the current and visible fragmentation of the individual MS programmes.

As such, FP6 and FP7 were thought to have allowed for:

- i) **significant enhancement of research in Europe**, in quality through competition and in intensity through more funding, and
- ii) improved efficiency **through coordinating national research policies**.

Have these aims been achieved?

- The coordination of national research policies has not been achieved, although FP7 was **quite successful in building foundations for ERA**, via the People, Cooperation, Ideas, and Capacities Programmes. ERAB acknowledges this resulted in a **"collaboration fabric"** among researchers, which is a unique asset for Europe.

The overall efficiency of the EU innovation system suffers from **a large number of instruments which are overly complex** and have different funding schemes, rules and timetables, responding to the needs of different beneficiaries. In addition to its complexity, the financial regulation imposed on the EC as well as the associated procedures lead to **an unacceptably heavy and costly bureaucracy**, to a level which discourages actors (mostly in industries and particularly in SME's). Clearly the number and complexity of the instruments and the financial regulations have to be reviewed urgently.

- In line with the application of the rules and procedures, most of the Framework Programme (FP) instruments are centrally managed by the EC Services (or by Executive Agencies newly put in place, but applying the same strict rules). The current rules in fact counter the very nature of R&I, which is generally high-risk and long-term. This is especially true for large European and international projects which should be a key element of ERA (e.g. JTI, JPI, or EIT); these projects **require effective governance and efficient management** suitable for high-risk R&I projects.

- The current annual amount of the European budget devoted to R&D (7.5 billion Euros on average in FP7) is only 3.6% of the total amount spent by all MS in this field. The amount of national funds spent on R&D actions coordinated at the European level is a meagre 11 billion Euros in 2007 (15% of public R&D funding in all MS). These numbers do not allow the Commission to launch R&D programmes of a truly European nature. The EC should therefore concentrate on how to attract MS participation in common programmes at the European level and pool a larger amount of their R&D investments. **This issue is probably the main problem in achieving an efficient and productive CSF implementation.**

The following paragraphs give ERAB's reflection on current specific funding instruments:

- **Within the Cooperation Programme**, collaborative research continues to foster transnational partnerships, even if projects are often too numerous, too small and consortia too large, without a consistent Grand Design. Some attempts to address this have already started, such as the European Technology Platforms (ETP) and Joint Technology Initiatives (JTI). The SET-Plan approval is a good example of how to start a large strategic R&I programme.

These pioneering projects are a key step towards creating a true ERA in their fields. They should demonstrate that efficient partnerships can be established across national borders, joining national public and private funds, and benefiting from appropriate governance and management. Therefore the difficulties faced by the projects (see the JTI Sherpas Group report) must be resolved, in particular as related to the complexity and rigidity of a **Community Body status and the inability to pool MS resources**.

- In addition to FP funding, **the Joint Programming Initiatives (JPI)** are designed to contribute to solving major societal challenges, for which MS, on a voluntary and variable geometry bases, will implement a common strategic research agenda. Nine such programmes have been agreed upon by the Council. The appropriate framework conditions for this new process are still being debated, but given their similarities with Joint Technology Initiatives (JTI), it is quite probable that the JPIs will encounter some or all of the same difficulties.

- **The European Institute of Innovation and Technology (EIT)** is just beginning to establish its Strategic Innovation Agenda and therefore it is not possible to assess whether this approach adds value.

- **Actual usage of the Structural Funds** (around 25%), supposed to help all regions to build R&I capacities corresponding to their situation and priorities, is not transparent. It's actual **objectives and management should be revised urgently to support ERA wide R&I**.

3. Driving principles for the future CSF, according to ERAB

In line with preceding remarks on the current FP, ERAB formulated recommendations, which are, as mentioned above, based on the two published ERAB Reports (2009 and 2010). These recommendations are still relevant and urgent. ERAB stands for improvement through drastic changes: less complex framework with clear priorities and objectives, less bureaucracy and more efficient management, supporting fast decision and high risk/high impact choices, performance-oriented and trust-based funding structures and a need to convince MS to evolve from their national focus and pool resources across borders to implement strategic programmes. In addition it is vital that all related disciplines are involved from humanities and social sciences through to medical practice and manufacturing. Any attempt to support discipline silos should not be encouraged if value is to be achieved.

Some of these recommendations are recalled in the following paragraphs:

- **Concentration of R&I-funding** around a selection of high-impact research themes, driven by societal needs and relevant to «Europe 2020», on which MS and EC can agree on a common approach and on the joint support mechanisms necessary to move forward. Addressing «Grand Challenges» would provide integrated research programmes, covering the whole cycle of innovation and allowing for interaction between research

stages all the way from curiosity-driven to applied research in development and innovation all the way through delivery to market and society. The success of ERA via the CSF will be measured by the number of such programmes, launched **as joint work across borders, pooling MS public and private funds and EC contributions**, and by progress made in quality, coherence and efficiency of their implementation.

- **Frontier research** should always be a priority, while high risk is to be promoted if high impact is the end goal. **Striving for excellence**, not only in sciences but also in problem solving, innovation and economic impact, should be the only way with the support of European-wide competition. Current differences in new MS research structures and development require targeted cohesion measures to allow for fair competition (see ERAB's Views on Achieving Cohesion in European Research and Innovation, April 2011).

- **Implementation** of programmes should be in the hands of **mission-driven agencies or management structures** which are accountable for a well-defined and politically agreed set of strategic goals updated regularly by the European Council and the European Parliament in conjunction with the Commission who can take a truly ERA perspective. Details of the programmes and how they are implemented should be in the hands of the agencies who will consult with their communities. Research-intensive Organisations in most MS provide examples of professional management and goal-oriented focus in research; they should be encouraged to **build long-term institutional alliances amongst them**. ERAB recommends that governance of European programmes be based on a set of **independent institutions/agencies at arms-length of the EC and MS** as should be the case of the European Research Council (not fully the case yet). High risk/high impact and tangible results should progressively become the dominant criteria for R&I funding.

- Facilitating successful public-private partnerships relies on **completing the «Open Innovation Charter»**, which would help establish sustainable collaborations and confident knowledge exchange between public research organisations and industrial firms. Management of Intellectual Property Rights (IPR) for knowledge-transfer activities is an important matter to every partnership and should benefit from the guidelines of the «Responsible Partnering Handbook»; an IPR valorisation instrument which would facilitate SME access to the knowledge market would be welcome. In order to help **young innovative firms** to access venture capital, a European Fund should be established to invest in early-stage proof-of-concept and business development before private institutional investors start to play their role. An innovation programme specific to high-tech SMEs and supported by risky funding and bank guarantees (e.g. Risk Sharing Finance Facility, RSFF) should be put in place in coordination with EC and local administration to receive similar national support.

- **Pre-commercial Procurement** of R&D services from the private sector, using the very large public sector purchasing power, is a very promising scheme to drive innovation.

- **At least 30% of the Structural Funds** should be used exclusively for R&D&I investments. Similarly a part of **the EC agricultural budget (ERAB suggests 10%)**

should be earmarked to contribute to the CSF and dedicated to the Grand Challenges as related to agricultural activities and producing safe and sustainable food for all.

• **There is a deficit in scientific knowledge dissemination.** The number of trained scientists, engineers and researchers moving between institutions (both public and private) is too small. There also is a deficit of training to support working in multi-disciplinary environments. There is little evidence of compulsory training in entrepreneurial skills. Education is the responsibility of MS, however a stronger interaction should exist between universities, laboratories, and enterprises while benefiting from the **Marie Curie programme**.

Based on these recommendations ERAB proposes a new architecture for EU R&D&I-funding. The structure is described in the next chapter.

4. A new architecture for CSF funding

The CSF proposes to fund **the implementation of a strategic programme to tackle societal challenges** in partnership between the EC and (groups of) MS. All actors should share common objectives and all funding instruments including those in MS should be aligned in a common strategic and funding approach.

Emphasis should be on innovation to address societal challenges, and lead to major market opportunities and economic benefits. Innovation would be the results of **an integrated programme, an activity line for each challenge**, covering the whole cycle and related set of instruments from basic S&T research all the way to D&I. The strategy implies establishing strong links (feedback loops) between every stage of the innovation cycle, thus leading to various types of innovation, and building an ecosystem mostly inexistent to date. This European Innovation Partnership (EIP) approach will strengthen the **EU's competitiveness and its science base**.

ERAB would like to emphasize **the role of the EC as a catalyst and facilitator** in attracting and pooling national funds for joint activities, and to ensure formal commitment from the MS a lacking element in the current JTI and the JPI initiatives. As such, MS Groups would join and finance a common strategy, on a voluntary and variable basis, thus introducing a mix of intergovernmental and European participation in support and management. However, in view of current experiences, there is a clear need for a **more effective ERA tool for pooling MS resources, with or without EC co-funding**.

Focusing on societal challenges would help MS to agree on common research strategies. In order to have the necessary confidence in pooling resources at the European level more efficiency will be required via **appropriate governance and management**, for example:

- Governance should be taken up by an Independent Agency at arm's length of EC and MS; the former should be legally able to make long term commitments ;
- Each MS participant should contribute through a limited number of funding institutions with a clear task-oriented mission;

- The individual Member State institutions will be accountable for their contribution to the programme of the Agency and will develop their own working procedures with the individual programmes, to encourage high risk/high gain developments;
- The execution of the strategy is determined by the MS institutions, which are held accountable for the outcome ; success or failure of a programme should be judged by actual outcome in terms of new insights brought to sciences or technologies or any other worthwhile impact on society ;
- Achieving high risk/high gain research requires research management and leadership willing to take high risks in the MS institutions concerned.

A possible architecture for the CSF, according to the content of these comments, is proposed by ERAB in the following figure.

Distribution of EU Funds		70%	30%
		Initiative:	EU MS/Private contributions
	Character of research:		
30%-40% <i>Mainly led by DG R&I</i>	Curiosity driven	<i>ERC/FET Marie Curie Grants Other enabling activities</i>	<i>Research Infrastructures Specific university/institution training for global challenges</i>
60%-70% <i>Led by DG R&I plus all relevant DG's according to the specific Grand Challenges</i>	Mission driven (Innovation Industry/SME) in Grand Challenges EU 2020 agenda	<i>European Innovation Partnerships With all MS Cooperation</i>	<i>European Innovation Partnerships With Groups of MS SME EIT</i>

It should be noted that “curiosity driven research” also includes the support for New Emerging Technologies (FET) in addition to basic research.

All research activities are shown in matrix form: the horizontal columns reflect the origin of the leading initiative, the vertical columns indicate the character of research activities, either curiosity or mission driven. The resulting programmes are all managed through a system of Independent Agencies on the model described above.

A) Support of "Curiosity Driven Research" should be increased from current levels up to 40% to reach the long term goal of 50% of total EC funding for frontier high risk research and development.

- **The ERC** with its original IPR and grant portability is an example that can be extended from supporting basic science to **future emerging technologies (FET) in all fields, not only ICT**, without jeopardizing existing support for basic research.
- **Marie-Curie Grants** should be extended into new areas such as COFUND, doctorates in industry, temporary mobility of post-docs and middle-career scientists or engineers to/from a public laboratory or industrial firm, knowledge transfer partnerships, industrial host fellowships, lifelong learning. **Success rates should improve through greater funding.**
- **Research Infrastructures** require more financial EC support for open accessibility and new construction beyond the preparatory work done. Aside from e-infrastructures, funding should include very large **demonstrations or prototypes** to display key technologies.

Activities should be governed by Independent Agencies which are at arms length from the Commission on the model described above: one for the ERC acting under new financial regulations that allow for considerably more freedom of action (High risk/High gain choices). It is preferred that there is one overall agency with separate divisions supporting fundamental research, applied research, key enabling technologies, research infrastructures and mobility. The action « **Other enabling activities** » refers to what was previously under the "People and Capacities", such as International Cooperation, Development of Research Policies and Science in Society. Here, funding should be much lower than described under the three bullets above.

B) "Mission-Driven Research" spirit is a new approach.

At the core of this part of the CSF would be support of a limited number of jointly agreed major themes (Grand Challenges) along the lines of Europe 2020 (energy, climate change, etc.). Their strategic goals and priorities are politically defined by the European Parliament and Council. Their research goals are set by the EC, in collaboration with the related stakeholders. For each of these long term 'missions' (suggested names '**Research and Innovation Strategy for energy / climate change**' / etc.) an Agency type management structure, at arms-length from the EC and MS, would be set up to govern the implementation supported by pooling resources from the MS and the EC. Under each theme a full spectrum of available funding instruments/strategies, with or without competitive calls, would be used as decided by its management.

To date, EC support for technology development within the different themes of the Cooperation programme has allowed for progress in collaborative research across boundaries and among public and industrial laboratories on projects of limited size without strategic links between them. It would be unreasonable to stop this kind of action; therefore, even if the agreed missions should include a large majority of supported projects, a limited number of excellent proposals which could not fit in the

missions objectives (but could provide an innovative approach to generic technologies) could exceptionally be supported through the maintained Cooperation programme.

The EIT should be maintained, but it should become part of the CSF, while maintaining its links to education. Activities currently under the Competitiveness and Innovation Framework Programme (CIP) should be continued as an integral part of the CSF and extended to all actions supporting innovation in industry, including all those in the supply chain such as SMEs.

**Towards a Common Strategic Framework for Research and Innovation:
ERAB Views and Recommendations (May 2011)**

Annex list:

01. The ERAB 2020 Milestones
02. Key 10 recommendations (July 2010)
03. The contribution of FP7 instruments to the establishment of a genuine European Research Area (February 2009);
04. The role of Venture Capital for the R&I strategy (April 2010);
05. The role of public procurement for the R&I strategy (April 2010);
06. The communication 'Simplifying the implementation of the Research Framework Programmes' COM (2010) 187 (May 2010);
07. ERAB's recommendation to maximise High Risk – High Gain Research in the next Framework Programme, (December 2010).
08. ERAB's view on achieving Cohesion in European Research and Innovation (July 2010, updated April 2011)
09. ERAB views on Social Innovation (April 2011)
10. ERAB views on the role of International Collaborations (April 2011)



THE ERAB 2030 MILESTONES

Building the European Research Area is a long and difficult task - and for that we need a plan. ERAB's strategic vision is described in its report, 'Preparing Europe for a New Renaissance.'

To put it in concrete terms, here we list **26 goals and 76 recommended actions** which we believe to be important steps on the road to a united and innovative ERA by 2030. They are **divided into four broad themes**, corresponding to scheduled sessions in the Seville conference. For all these milestones, we ask whether they are ambitious enough, and how they would be implemented.

Read the full ERAB strategy paper here: http://ec.europa.eu/research/erab/pdf/erab-first-annual-report-06102009_en.pdf

THEME I: UNITED ERA IN A GLOBAL WORLD

ERAB Vision: goals by 2030	Recommended Actions	Impact by 2030
<p>1. The EC's share of ERA-wide public, non-military research funding doubles to 10%.</p>	<p>1.1 The current funding for thematic research programmes is maintained to at least the present levels (Cooperation programme).</p>	<p>The innovation gap with the US and other innovation leaders is reduced to zero and Europe acts as a role model in research and innovation with respect to addressing the "Grand Challenges", such as climate change, energy supply and ageing societies.</p> <p>Europe increases its share of top-ranked universities (see theme IV) and becomes more attractive for private investment on research.</p>
	<p>1.2 The overall research budget is increased by adding a tenth of a percentage point to VAT, for the benefit of research into grand challenges.</p>	
	<p>1.3 30% of the Structural Funds are used for research, development and innovation (RDI), 10% of the Common Agricultural Programme budget goes specifically to agricultural research dedicated to agri-based issues in food, health and energy.</p>	
<p>2. There is a significant increase in the coordination of scientific research grant programmes across the ERA, to at least 10% of funding.</p>	<p>2.1 A European grant union between member states and the EU exists with a global outlook, driving joint initiatives.</p>	<p>Europe maximises the impact of research and innovation.</p>
	<p>2.2 Strengthen EIT in coordinating grant programmes in specific fields.</p>	
	<p>2.3 Increase investment on European Research Infrastructures.</p>	
	<p>2.4 An ERA-wide monitoring system tracks all joint initiatives (from bi-national to all), joint programming, intergovernmental organisation and cross-national shared infrastructures.</p>	
<p>3. Mobility triples, with up to 20% of EU doctoral candidates working outside their home country.</p>	<p>3.1 Funding for Marie Curie-type programmes increases.</p>	<p>Young researchers develop a truly European career in research and innovation in order to strengthen the ERA and Europe's competitiveness.</p> <p>At least 30% of young researchers come from outside of Europe.</p>
	<p>3.2 English is the standard for PhD and other postgraduate studies whenever relevant.</p>	
	<p>3.3 Barriers to the cross-national movement of scientists and families no longer exist. Financial incentives are there for researchers willing to be mobile.</p>	
	<p>3.4 A European research passport/visa for successful non-European researchers exists which enables them to move easily around Europe and which encourages non-Europeans to come to ERA centres of excellence.</p>	

4. The fiscal regime for R&D and innovation incentives is optimised across the EU.	4.1 Optimise fiscal and social benefits for industries employing significant numbers of researchers.	A dynamic and truly European climate for research investment exists so that more companies will choose Europe as their hub for RDI.
	4.2 The design and implementation of state aid and procurement rules are optimised to have the biggest impact on entrepreneurial activities. Create a strong European innovation demand (Aho Report).	
	4.3 A pan-European unified market for cross-national, research-related investments (including risk/venture capital) is created.	

THEME II: SCIENCE, SOCIETY AND POLICY

ERAB Vision: goals by 2030	Recommended Actions	Impact by 2030
<p>5. A third of public, non-military research is geared to grand societal challenges, with multi- and trans-disciplinary approaches.</p>	<p>5.1 The increase in funding as proposed under Milestone 1 is applied to this purpose.</p>	<p>ERA contributes lasting solutions to the Grand Challenges, mindful of their global impact.</p>
	<p>5.2 Europe has at least a "man/woman on the moon" project for each Grand Challenge it wants to address and gears all its instruments, including PPP, to that end.</p>	
	<p>5.3 Multi- and trans-disciplinary funding has priority for Grand Challenges research.</p>	
	<p>5.4 Training to manage multi- and trans-disciplinary projects as well as to engage the public are standard parts of research education.</p>	
<p>6. A more educated citizenry is trained in science and technology issues to be able to participate in policy debate.</p>	<p>6.1 All outputs of publicly funded research are available via 'open access' to all interested parties, and universities undertake a broader role in science communication.</p>	<p>European citizens regard the results of decision-making based on scientific research as optimal for the common good.</p>
	<p>6.2 The impact of science and technology on the innovative power of society and all kind of businesses is underpinned.</p>	
	<p>6.3 Open up universities to the public by promoting life-long membership.</p>	
<p>7. A universal code of scientific ethics is adopted by the whole European research community, enunciating social responsibilities as well as intellectual freedoms.</p>	<p>7.1 As part of the contract between science and society, a code of ethics is in place akin to the Oath of Hippocrates for medical practitioners.</p>	<p>Rigour (in decision-making), Respect (for fellow man, colleagues and world), and Responsibility (for action) drive the relationship between science and society.</p>
	<p>7.2 All scientists sign this ethical code when starting their graduate studies.</p>	
	<p>7.3 The code of ethics is part of EU treaty.</p>	
<p>8. 30% of all scientists, including those in the humanities and social sciences, are trained in research fields relevant to the Grand Challenges.</p>	<p>8.1 European funding for Masters and PhD training focuses on the Grand Challenges, including attendance at cross-disciplinary summer schools.</p>	<p>The critical mass of students educated in the Grand Challenges is increased and a better linkage between investment in research and education is a reality. The Grand Challenge researcher is an accepted and widely present researcher profile with full career opportunities.</p>
	<p>8.2 Internships in the business and public sector are part of the standard research curriculum.</p>	

<p>9. The tools of 'e-science' are deployed throughout the ERA, permitting international collaboration so that all researchers will see themselves as part of the global research system.</p>	<p>9.1 An EU central depository for publications in all areas of EC-funded research is operational.</p> <p>9.2 Paper transactions as a means of communication between researchers and public funding organisations are minimised.</p> <p>9.3 EC funds prioritise on-line, postgraduate inter-university programmes as well as on-line joint research programmes.</p>	<p>Open Access and virtual science are fully embedded practices in European research.</p>
<p>10. The EU and Member States spend up to three times as much as in 2005 on higher education, or 3.3% of GDP.</p>	<p>10.1 The increased funding (Milestone 1) is used to better match - by 2020 at the latest - the overall profile of higher education with all skills and competencies needed for a knowledge-based society.</p> <p>10.2 Budget priorities of Member States with regard to research are re-assessed to take into account the needs of the Knowledge Society. A reasonable timeline is deployed for monitoring, as this is a condition for complying with the Europe 2020 agenda.</p>	<p>A culture of science and innovation thrives across Europe.</p>
<p>11. Irrespective of age, race or gender, ERA should exploit all available talent.</p>	<p>11.1 Half of all scientists and research policymakers, across all disciplines and at all levels of the science system, are women.</p> <p>11.2 Restrictions on the age of competent researchers should be lifted where they exist.</p> <p>11.3 Specific grants are in place for parents taking up research after family leave.</p> <p>11.4 Child-care provisions are compulsory for all higher-education and research institutes.</p> <p>11.5 Enabling parents on family leave to take full advantage of the opportunities of e-science is compulsory and at zero cost for the beneficiary.</p>	<p>All knowledge resources that Europe has are maximised for the common good.</p>
<p>12. The EU has a fully functioning, independent Chief Scientific Advisor, supporting its decision-making with the best available evidence, horizon-scanning and future scenario planning.</p>	<p>12.1 A clear functional specification and strong profile for the CSA (who has to report directly to the President of the EC) is defined immediately.</p> <p>12.2 Foresight and participatory technology assessment are standard in policy design and decision-making.</p>	<p>Policy decisions are evidence-based to bridge the gap between society and decision-making, and increases the public confidence in European political decisions related to science and innovation.</p>

THEME III: OPEN INNOVATION

ERAB Vision: goals by 2030	Recommended Actions	Impact by 2030
<p>13. A pan-European Open Innovation Charter is signed by all major stakeholders.</p>	<p>13.1 The Open Innovation Charter is in place and is a reference in the selection criteria and guides for applicants in Framework Programme 8. Key enablers for open innovation are the guidelines of the Responsible Partnering Handbook.</p>	<p>Open Innovation is the default position for European research and the Open Knowledge Institution is an ISO standard for higher education and research.</p>
	<p>13.2 State aid rules and their interpretation are reviewed and redrafted to enable maximum flexibility in the support of research and innovation.</p>	
	<p>13.3 We achieve full implementation of the existing recommendations on intellectual property and partnership - e.g. the 2008 EC Recommendation on the management of intellectual property in knowledge transfer activities and Code of Practice for universities and other public research organizations.</p>	
	<p>13.4 A pan-European label, “Open Knowledge Institution”, for higher education and research, acts as a gold standard for excellence in innovation in the ERA.</p>	
	<p>13.5 A single, strong and credible European patent is established by 2015.</p>	
<p>14. Overall R&D funding rises to 5% of GDP, of which industrial R&D accounts for two-thirds.</p>	<p>14.1 Implement the wide range of policy measures necessary at European and national levels to improve framework conditions - and hence expected returns - for private investments (including venture capital) in R&D and innovation. Promote Private Public Partnership (PPP) to stimulate investments in the development of new technologies.</p>	<p>The Grand Challenges create a strong market demand for innovative products and services to “pull through” innovation and trigger more public and private investments in the Knowledge Triangle.</p>
	<p>14.2 A reasonable time line is deployed (and monitored) to make sure there is a doubling of government expenditure on R&D to reach 1.7% of GDP by 2030, and a tripling of business expenditure on R&D to reach 3.3% of GDP by 2030. In these calculations the contributions of EU funding are included.</p>	

<p>15. 2% of public procurement ERA-wide is earmarked for innovative and pre-commercial technologies, and is open to European-wide competition.</p>	<p>15.1 Expand the EU Lead Market Initiative (also addressing societal challenges) and stimulate Member States to participate more actively, while developing similar initiatives at national level. Develop metrics to monitor public procurement of innovative technologies that are commercially viable and do not require further R&D, and systematically gather data on public procurement of R&D.</p> <p>15.2 Explicitly make public procurement a policy vehicle to promote R&D and innovation, comparable to the Green Public Procurement approach. Encourage governments to bundle public procurement among Member States in order to create more interesting markets. Specify functional performance rather than technical details in procurement tenders.</p> <p>15.3 2020: Pre-Commercial Procurement (PCP) of R&D is mainstreamed at national, regional and local levels and public procurers have tools for managing rather than avoiding risks.</p> <p>15.4 Complement Pre-Commercial Procurement at national, regional and local levels with the introduction of an SBIR scheme at European level, fully open to participation by procurers and suppliers across the EU.</p> <p>15.5 Make (part of) EU co-funding in the context of the Structural Funds conditional on procurement of innovative technologies and R&D. This is also a means of gearing cohesion policy more towards stimulating R&D and innovation.</p>	<p>New technologies are available and used for dealing with the Grand Challenges.</p>
<p>16. Mobility of researchers between the public and private sector is high.</p>	<p>16.1 A doubling in industrial funding of academic research from 6.7% in 2006 is achieved by changing the structural interactions between private and public funding.</p> <p>16.2 Marie Curie schemes are expanded to support professional or industrial doctorates.</p> <p>16.3 Industrial achievements are fully taken into account for academic career paths. A code of best practice is there to monitor this.</p> <p>16.4 Legal and fiscal barriers no longer disadvantage the movement between public and private sectors.</p>	<p>Public-private research portfolios and careers are common.</p>

17. Risk capital available for early-stage technology rises up to 0.15% of GDP.	17.1 Large pan-European venture capital funds, co-financed by the private financial sector, are active, and funding of the EIF is expanded to match other continents (taking into account increased support from the European Commission, EIB and other public funding sources).	More start ups can grow out of the "valley of death".
	17.2 Fiscal, regulatory and bureaucratic obstacles to cross-border risk capital investments are removed.	
	17.3 In addition to the EIB a pan-European seed capital fund supports proof of concept and early stage development.	

THEME IV: AN ERA TO DELIVER EXCELLENCE AND COHESION

ERAB Vision: goals by 2030	Recommended Actions	Impact by 2030
18. 50% of EC research funding is going to frontier, high-risk research and development.	18.1 Develop a pan-European Training Programme that helps reviewers, auditors and researchers to identify and select promising high-impact research even if there is an associated risk.	The more complex needs of excellent frontier research, providing maximum benefit, are understood.
	18.2 A protocol stipulating a level of tolerable risk in research is agreed upon and applied to research performance-related auditing processes.	
19. Europe increases its share of top-ranked universities to up to 40% of the top 20 & 100 rankings, and increases its most-cited research world wide by a third.	19.1 The European higher education system is functionally diversified (teaching, research, technical skills). Fact-based metrics flag those groups that have high impact in R&D specifically in Grand Challenges. The EC supports this accordingly.	Europe's higher education system is globally competitive.
	19.2 Member States revisit the statutes/governance of their universities with a perspective to contribute to a competitive and excellent ERA.	
	19.3 To achieve a European-wide increase of standards, collaboration between higher and lower ranked universities is supported in all areas.	
20. The governance system for European research funding will be based on a set of arms-length agencies, as part of an 'ERA of Agencies'.	20.1 A functional system of coordinated agencies to support ERA is created, with the establishment of agencies for fundamental research, applied research, research infrastructures, training and mobility, policy and strategy and exploitation/valorisation of research.	The ERA is operational on a distributed agency model, governed on the basis of excellence and flexibility.
	20.2 Co-ordination is strengthened while governance is attributed on the basis of competence and not necessarily source of financing.	
21. Funding for public, non-military research is increasingly concentrated in research-intensive institutions.	21.1 A restricted number of European research institutes with enough critical mass for research and an ambition of global excellence is agreed on.	At least 50 of our innovation clusters, out of about 2,000 clusters large and small today, are world leaders in scale and quality.
	21.2 The potential of locating infrastructures in countries that have a deficit of representation in top-ranked institutions should be explored also through the use of structural funds.	

<p>22. The share of the EU budget devoted to research triples to 12%.</p>	<p>22.1 More Structural Funds progressively go to support leading-edge research.</p> <p>22.2 A 10-year funding scheme (diminishing over that time period) is in place by 2015 to support specific collaboration between research centres and universities in emerging economies with top EU centres elsewhere.</p> <p>22.3 Grant and project competitions targeted to Member States with GERD below the EU average are put in place to stimulate quality groups through competition and thus bridge the gap with Europe's leading research locations. Selection however will be on the basis of excellence criteria only as in the current ERC competitions.</p>	<p>Current deficits, in comparison to countries that are leaders in enterprise, are corrected. All European talent, irrespective of its geographical location, contributes to a successful European economy.</p>
<p>23. At least 30% of the Structural Funds are used exclusively for RTD (fostering partnerships, supporting pre-commercial procurement and investing in large-scale research infrastructures where needed) – double the current allocation.</p>	<p>23.1 Actions aimed at delivering this goal should be initiated without delay with particular emphasis on investing in Infrastructures that are accepted by the ESFRI system.</p> <p>23.2 Cost-benefit analysis on any expenditure for RTDI should fully take into account the significant contribution of intangible assets of research that contribute significantly to tangible outcomes such as jobs etc.</p>	<p>Excellent research facilities and research activities are equally distributed and accessible across Europe.</p>
<p>24. More than 75% of the overall EU budget is oriented towards investing in its future as a knowledge-based society.</p>	<p>24.1 Funds for successful partnering models that foster good governance and innovation are available.</p> <p>24.2 A roadmap outlining a holistic approach to get to this target is needed by 2012. European Society and Enterprise will need RTDI in all sectors and RTDI therefore cannot be considered in a siloed manner associated with a single Directorate General. Hence each Commissioner will have to integrate RTDI into their plans, and the budget associated with it included in the calculation of overall RTDI expenditure.</p>	<p>The EU budget effort fully reflects the needs of a knowledge-based society and economy.</p>
<p>25. The major research institutions of the well-developed regions of Europe work in partnerships, based on excellence, with those of the lesser-developed regions.</p>	<p>25.1 Special funds are available to support successful partnering models that foster good governance and innovation.</p> <p>25.2 Incentives to promote durable inter-university collaborations in complementary converging fields are particularly welcomed.</p>	<p>The impact of ERA is delivered by the actions of all regions of Europe.</p>
<p>26. Half of the adult population has achieved tertiary education – double today's rate.</p>	<p>26.1 This is essential to achieve an innovative EU 2020.</p>	<p>A significantly higher number of Europeans will contribute to an innovation-based economy and society.</p>

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At the ERAB Conference in Seville the Commissioner laid down the challenge to bring forward 10 key recommendations.

The conference was essentially a **public peer review of ERAB's first report** "Preparing Europe for a new renaissance. A strategic view on ERA" and the subsequent 76 recommendations that ERAB produced for consultation.

These had been previously circulated amongst a selected group of stakeholders and feedback emphasized that the need to create a fully effective ERA was very **ambitious but essential** if many of the Global Challenges were to be tackled. Additionally the conference emphasized that any action should be undertaken with regard to their **global significance and in conjunction with international partners**.

A strong call was issued for EC policy to **offer integrated policy solutions** for the R&I deficit Europe faces in general and specifically with regard to addressing the Grand Challenges.

A continuous plea was made for the EC to **demonstrate strong and firm leadership driven by the search for excellence** in R&I policy.

The overall sense of **urgency** pervaded the whole meeting. Time is running out.

Recommendations

1. Short-term (Immediate action)

1. Create a single **EU-wide patent** and an **Open Innovation Charter** (within 2 years)
2. Agree a fast track timeline for **full and widespread implementation of pre-commercial procurement** of R&D.
3. **Concentrate R&I funding** around a selection of themes (relevant for EU 2020), driven by "man on the moon" projects that capture the public's imagination agenda; e.g.:
 - Smart and green growth: realize a zero carbon public transport system,
 - Aging graciously: a socio-tech environment to be able to live with dignity at home until death.
4. Create an annual "**City/region of Innovation in Europe**", with criteria matching the Grand Challenges (honouring e.g. zero carbon emissions, 70% of all citizens engaged in "citizen science", 50% reduction in days lost on health grounds)
5. Issue an **EU Framework Directive on Research & Innovation** focusing particularly on creating a single market for R&I. This directive should address and make propositions to:
 - harmonize and strengthen public and pre-commercial procurement schemes,
 - create a European Research Certificate/Passport to enhance mobility of researchers,

- support pan-European Graduate/Research Schools focused on Grand Challenges, including the possibility of developing a high level European Ph.D,
- foster flexible cross border research funding,
- establish a European Peer review College for projects addressing Grand Challenges.

2. Mid-Term (3-5 years)

6. **Implement pre-commercial procurement** of R&D around a few commonly agreed big projects, e.g.: to

- procure 50 quantum computers of a certain specification,
- develop an accelerator driven nuclear plant to eradicate long term radioactive waste,
- produce equipment for large scale artificial photo-synthesis.

7. When FP8 starts, all funding is **concentrated and streamlined** by:

- minimising management obligations for all funding schemes to the strict minimum by making the funding output based on research and innovation deliverables mainly,
- earmarking 30% of the Structural Funds and 10% of the CAP for dedicated R&I projects,
- creating a commonly accepted set of research output metrics based on research impact and innovation delivery.

8. **Foster an acceptable degree of risk taking and excellence** throughout **all** R&I programmes by accepting that research and innovation will take unexpected paths as new ideas are explored. Minimise application paperwork by setting limits for each call and create independent but accountable bodies that can best foster this environment for all areas of R&I.

9. Create a **European Venture Capital fund** capable of investing in early stage proof of concept and business development prior to commercial investment.

3. Long-Term (5+ years)

10. Make **result and risk-oriented funding** of research and innovation projects the dominant criterion for R&I funding of the EC by **reducing** to a level comparable or better than our main competitors the fiscal burden on RTD labour throughout Europe.

To get started ERAB proposes that **Europe should take the lead** in inviting all global stakeholders world wide to participate on a regular basis to make top level decisions and monitor progress on common R&I actions for tackling the global challenges.

This "**Davos for R&I**" will allow Europe to take a leading role in the global world of research and innovation.

EUROPEAN RESEARCH AREA BOARD

ERAB views on the contribution of FP7 instruments to the establishment of a genuine European Research Area

1. Introduction

Since the launch of the first Framework Programme (FP) 25(!) years ago, tens of thousands of transnational projects in successive FPs have prepared a solid foundation for the European Research Area (ERA). Any researcher can safely call any public or private colleague in Europe to set up collaboration: as the FP rules of the game are clear, these researchers can talk science and technology right away, without having to worry about the conditions and modalities of collaboration. In addition, matchmaking mechanisms are in place to facilitate partnering. The resulting collaboration fabric is a unique asset for Europe.

2. Contribution of FP7 instruments to the establishment of the ERA

The European Research Area Board (ERAB) wishes to highlight some FP7 instruments that are particularly contributing to the establishment of a genuine ERA:

FP7 Cooperation Programme

- Collaborative research continues to foster transnational partnerships.
- The 34 European Technology Platforms (ETPs) have produced widely recognised pan-European Strategic Research Agendas (SRAs). In addition to contributing to the definition of the themes and Work Programmes in the Cooperation Programme, some of the SRAs explicitly serve as references for the direction of national and regional research programs.
- The ERA-NET scheme supports coordination of national research programmes.
- To further integrate research activities under national programmes into real European research programmes, various approaches exist to enable co-funding of research projects by both Community and national funds in variable geometries:
 - the ERA-NET Plus scheme, with Community funding topping-up joint transnational funding;
 - actions under Article 169 of the Treaty, in particular Ambient Assisted Living (AAL) and Eurostars, with the Community financially participating in national programmes implemented jointly;
 - actions under Article 171 of the Treaty, in particular ARTEMIS and ENIAC, the two Joint Technology Initiatives in the ICT domain that combine resources from the Community, 20+ national programmes and the private sector in public-private partnerships.

Each of these actions is effectively creating a true ERA in its specific domain.

FP7 Ideas Programme

- By providing a bottom-up Europe-wide competitive funding structure, the European Research Council (ERC) is stimulating the very best individual teams to excel at a higher level than in national competitions.

FP7 People Programme

- The very popular Marie Curie actions effectively stimulate the transnational mobility of researchers as a tangible embodiment of the ERA.

FP7 Capacities Programme

- The “Research Infrastructures” activities optimise the use and development of existing research infrastructures and help create new research infrastructures of pan-European interest, with the ESFRI Roadmap (European Strategy Forum on Research Infrastructures) increasingly guiding national investments.
- The “Regions of Knowledge” activities foster transnational cooperation among regional knowledge clusters. Furthermore, they help regions to identify their comparative advantages, discover ways of specialize and invest accordingly in their research capacities, thereby increasing the overall efficiency of the ERA.
- Activities under “Research potential of Convergence regions” help unlocking the research potential in the EU’s “convergence regions” and facilitate their researchers to fully engage in the ERA.

3. Research Infrastructures

It was widely recognised under FP6 that Europe was falling behind its competitors in the field of major European Research Infrastructures. The ESFRI Roadmap published in 2006 articulated the needs of the research community and was universally accepted by Member States and the Commission. The new instrument to fund the preparatory phase of these infrastructures is very welcome. However, given the need to obtain intergovernmental agreements on both European and Global Research Infrastructures with respect to governance and funding, the final commitment to taking such projects forward is very slow and could be aided by a truly European model for governance, financing, etc. Furthermore, there is a brokerage role to be undertaken by a European Agency.

While the funding of transnational access to existing Research Infrastructures is welcome, the provision is limited and is insufficient to raise the aspirations of many young researchers from newer Member States. There has also been uncertainty about the continued funding of I3 consortia which has not helped European integration.

4. Towards a risk-tolerant and trust-based approach in research funding

Thanks to a fair degree of continuity with respect to FP6, FP7 had a smooth start, without any major problems. However, in spite of all efforts to achieve simplification, no real breakthrough could be achieved in cutting red tape. Also the multitude of instruments adds to the complexity.

The new Treaty – once ratified – will for the first time provide a legal basis for the European Research Area. Nevertheless, in view of the difficulties experienced in genuinely simplifying FP7, in setting up the aforementioned variable-geometry co-funding mechanisms and in establishing the JTI as real public-private partnerships within the current institutional

constraints and legal complexity of the European Union, ERAB wonders whether the EU has the right instruments at its disposal to create a true European Research Area.

To improve efficiency, increase speed and reduce transaction costs, trust is a crucial element. However, the current institutional system seems caught in itself, paralysed by the political necessity to avoid mistakes rather than managing risks. Economically speaking, the associated transaction costs have grown completely out of proportion, with marginal costs of controls, checks & balances exceeding their marginal benefits. These transaction costs will only increase by adding yet another layer and outsourcing management activities of the Commission in FP7 to other entities (ERC, Executive Agencies, Joint Undertakings, etc.), if these entities basically remain subject to the same regulations as the Commission services itself.

Whereas in principle there are strong arguments for having much more research activities at the European level, the red tape that currently seems inherent to the European approach turns off too many researchers, keeps national governments from fully engaging in EU-level initiatives and makes the private sector reluctant to become involved in public-private partnerships if implemented as Community bodies.

For establishing a genuine ERA and making Europe a better place for research in the future, this is an issue deserving serious attention. Key constraints in this respect are the Financial Regulation applicable to the general budget of the European Communities and its Implementing Rules. For example, the personal financial liability for Staff officers induces a zero-risk, zero-trust attitude. Furthermore, the Financial Regulation seems less suited for dealing with public-private partnerships.

Use should therefore be made of forthcoming opportunities to revise this Financial Regulation and create a partial exemption for research and innovation, to account for a certain degree of risk that is inherent to these activities. In its Communication on the ex-post evaluation of the IST Thematic Priority in FP6 of September 4, 2008, the Commission advocated a risk-tolerant and trust-based implementation of the rules on research funding. Furthermore, in its European Economic Recovery Plan of November 26, 2008, the Commission announced a clarification of the legal framework for public-private partnerships for research investments. ERAB is of the opinion that these proposals would be important steps towards an effective and efficient ERA and calls upon the European Parliament and the Council to enable a risk-tolerant and trust-based approach in research funding, as well as real public-private research partnerships.

EUROPEAN RESEARCH AREA BOARD

ERAB views on the role of Venture Capital for the R&I strategy.

The Issue

The lack of private investors in early-stage financing makes seed and start-up investment difficult in Europe. VC fundraising is made particularly hard in Europe due to the low rate of return. For the period 1999-2008 the average rate of return for VC amounted to only 0.2%, against 15.5% in the US¹. Also in earlier periods, EU VC has systematically underperformed compared to the US. On top of that, VC and business angel activities (worldwide) have been hit by the financial crisis and VC focus has shifted away from early-stage investments resulting in making the so called "Valley of Death" extremely difficult to cross for start up high technology companies.

ERAB proposes to develop a policy which aims at increasing risk capital for early-stage technology development, to 0.15% of GDP

Venture capital (VC) is a major source of funding for new technology-based firms. It plays a crucial role in promoting radical innovations and is one of the key determinants of entrepreneurship. VC is provided by specialised financial firms acting as intermediaries between primary sources of finance (such as pension funds or banks) and firms (formal VC). It is also provided by so-called "business angels" (usually wealthy individuals experienced in business and finance who invest directly in firms and provide guidance).

The development of a venture-backed company has three basic financing stages, with the first two defined as "early-stage":

1. Seed capital is provided to research, assess and develop an initial concept.
2. Start-up financing is provided for product development and initial marketing.
3. Expansion financing is provided for the growth and expansion of a company that is breaking even or trading profitably.

In addition to capital, VCs bring financial and business development expertise to early-stage companies. In other words, VC is "smart money".

ERAB has proposed that risk capital available for early-stage technology development should move to 0.15% of GDP by 2030. On the basis of the Eurostat data for 2008, to achieve this would require a sevenfold increase of the present level of available risk capital. . As the VC market has collapsed since the financial crisis, early-stage investments may even need a tenfold increase from their current level to reach the ERAB target of 0.15% of GDP by 2030.

VC requires "patient capital". In Europe, pension funds are the main source of capital with 25% of all contributions to private equity and VC in 2008. Assets of the world's largest 300 pension funds in 2008 amounted to \$10.4 trillion. At No. 2 and No. 3 were Norway's Government Pension Fund, Oslo, \$339 billion, and Pension funds ABP, Heerlen, Netherlands, with \$243 billion².

¹ Data from EVCA and NVCA.

² Annual survey by Pensions & Investments and Watson Wyatt Worldwide, 2009.

A major shortcoming of VC in Europe is market fragmentation due to the national focus and hence subcritical size of VCs, and to differences between national fiscal and regulatory systems. Europe also has a difficult exit market for early-stage investors wanting to sell their stakes through a trade sale to a bigger company or to another investor, or an initial public offering (IPO) on the stock market. The fragmentation of the European IPO landscape (16 growth stock markets in 2007) limits liquidity and hampers the proper valuation of young innovative companies. Basically only the Alternative Investment Market (AIM) in London seems to have the size to work properly.

The European Commission, the European Investment Bank (EIB) and the European Investment Fund (EIF) are supporting early-stage investments and SME access to finance through various programmes, e.g. the Competitiveness and Innovation Framework Programme (CIP) and JEREMIE (with funding from the Structural Funds). Already in 2006³, the European Commission proposed that the "Community institutions and the Member States should create the conditions that allow the sustainable tripling of investment by venture capital funds in seed and start-up companies by 2013".

The main challenge to raise VC is raising early-stage investments in Europe much more attractive for individual, corporate and institutional investors.

Recommendations

1. Bridge the gap between the high public value of venture capital for Europe's economy and low private returns for investors by increased support from European Commission, EIB, EIF and other public funding sources.
2. Accelerate pan-European venture capital funds, co-financed by the private sector and expanded EIF funding.
3. Provide fiscal incentives for individual, corporate and institutional investors, VCs, business angels and young innovative companies.
4. Support young innovative companies also beyond their start-up phase.
5. Establish an integrated venture capital market within the EU.
6. Create efficient, integrated, pan-European trading platforms and quoted stock market(s) for young innovative companies.
7. Remove fiscal, regulatory and bureaucratic obstacles to cross-border investments.
8. Stimulate business angel investments by means of dedicated networks for spreading best professional practices.
9. Promote privately managed, diversified funds-of-funds.
10. Reduce short-termism in publicly-listed companies by promoting better disclosure of non-financial information, linking managers' pay to performance in the long run and attracting long-term oriented shareholders.
11. Help financial institutions to improve their internal expertise in assessing technology and train start-ups in convincingly presenting their propositions.

³ Communication on "Implementing the Community Lisbon Programme: Financing SME Growth – Adding European Value", European Commission, COM(2006)349.

EUROPEAN RESEARCH AREA BOARD

ERAB's views on the role of Public Procurement for the R&I strategy

The Issue

Addressing societal challenges with innovative technologies can boost market demand, while at the same time focussing the various public and private actions on the input, throughput and output sides of the innovation system are common goals.

If there is no market demand for innovative products and services or barriers exist in the market place, there is no point for firms in investing in R&D. The US public sector is spending \$50 billion per year in procurement of R&D, an amount which is 20 times higher than in Europe and represents approximately half of the overall R&D investment gap between the US and Europe¹.

ERAB proposes to develop a policy for ensuring that 2% of public procurement ERA-wide is earmarked for innovative and pre-commercial technologies, and is open to European-wide competition

Public procurement is the acquisition of goods and/or services for the direct benefit or use of governments. In 2007, total public procurement of goods and services in the EU amounted to 2.1 trillion euro or 16.9% of GDP. The value of openly advertised public procurement amounted to only 3.1% of GDP. Public procurement predominantly takes place at local and regional levels. At national level, most public procurement stems from ministries other than those responsible for research and innovation.

Earmarking 2% of public procurement expenditure in the EU for procuring R&D services and innovative technologies from the private sector would amount to some 40 billion euro, equivalent to almost five times total state aid for R&D and innovation in the EU (8.6 billion euro in 2008 or 0.07% of GDP²).

Although the EU regulatory framework for public procurement was revised in 2004 to better support innovation and the EC provided further guidance on innovation in public procurement in 2007, lack of awareness and unfamiliarity with the possibilities for procuring innovation and R&D within the legal frameworks for procurement and State aid are still widespread. This results in misplaced preconceptions and undue fears among procurers. Furthermore, risk avoidance is standard in current public procurement practices and by its very nature research based innovation is highly risky. Another major factor hampering public procurement of innovative technologies and R&D is fragmentation of public demand in the EU.

The EU has no central mechanism yet to separately report on the various subcategories of public procurement relevant for innovation and R&D.

¹ Pre-commercial Procurement: Driving innovation to ensure sustainable high quality public services in Europe, European Commission, COM(2007) 799, see

http://ec.europa.eu/information_society/tl/research/priv_invest/pcp/documents/commpcp_en.pdf

² Commission staff working document accompanying the State Aid Scoreboard - Autumn 2009 Update, see <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=SEC:2009:1638:FIN:EN:PDF>

To stimulate Europe's innovation system from the output/demand side, the EU Lead Markets Initiative is currently pioneering a novel approach entailing innovation-friendly regulation, standardisation and public procurement in six pilot sectors.

A specific new instrument for public authorities at national, regional and local levels to stimulate demand for innovation is Pre-Commercial Procurement (PCP³) of R&D services from the private sector. Modelled upon successful US examples (DoD, NASA, NIH) it was put forward by the Commission at the end of 2007. While exempted from the EU Public Procurement Directives and without constituting state aid, the PCP scheme entails risk-benefit sharing between public procurers and private suppliers in the R&D phase preceding commercial procurement tenders. However, in spite of endorsement by the European Council and a strongly supportive resolution from the European Parliament, the potential of this novel scheme still remains largely untapped.

Following the example of the US SBIR (Small Business Innovation Research), several Member States have implemented comparable SBIR schemes, focusing primarily on R&D by SMEs for developing innovative solutions and technologies for government.

The main challenge is to exploit the huge, largely untapped potential of the public sector purchasing power to drive innovation and stimulate private R&D, while at the same time enabling governments to perform their public tasks and address societal challenges more efficiently and effectively.

Recommendations

1. Make Europe's societal challenges into Lead Markets.
2. Explicitly make public procurement a policy vehicle to promote R&D and innovation, comparable to the Green Public Procurement approach.
3. Develop metrics to monitor public procurement of innovative technologies that are commercially viable and do not require further R&D, and systematically gather data on public procurement of R&D.
4. Expand the EU Lead Market Initiative and stimulate Member State to participate more actively, while developing similar initiatives at national level.
5. Mainstream Pre-Commercial Procurement (PCP) of R&D at national, regional and local levels.
6. Complement the use of PCP with the introduction of an SBIR scheme at European level, fully open to participation by procurers and suppliers across the EU.
7. Bundle procurement among Member States in order to create more interesting markets.
8. Consider also awarding prizes for developing innovative solutions, with guaranteed procurement as the reward.
9. Recognise that public procurement of innovative solutions and technologies entails risks, promote the acceptance of a certain degree of risks among governments, politicians and the general public at large, provide public procurers with tools for managing rather than avoiding risks, and develop incentives for public procurers in the form of risk sharing, for example by means of FP8, EIB, RSFF and Structural Funds.
10. Make (part of) EU co-funding in the context of the Structural Funds conditional to procurement of innovative technologies and R&D, also as a means of gearing cohesion policy more towards stimulating R&D and innovation.

³ See ref. 2.

EUROPEAN RESEARCH AREA BOARD

ERAB views on the communication “Simplifying the implementation of the Research Framework Programmes” COM(2010) 187.

1. Some General comments on the communication

Probably the focus of most criticism of the Framework programme by both individual researchers and industry is the excessive bureaucracy that is counter to the culture of research and innovation. It is the most frequently cited reason that industry (especially SMEs) do not apply for FP funding. At the recent ERAB conference held in Seville on 5-7th May it was top of the issues raised by young researchers in receipt of ERC grants. It is vital that this issue is addressed if the future innovation agenda is to be successful in supporting high risk research and innovation..

ERAB fully endorses the ambition of the EC to reduce this burden

ERAB recognises that there is a desirable, unavoidable and necessary need to have a reasonable level of accountability to ensure that the funding from the EU is spent in a correct manner. If the EC can get the balance right between monitoring for the correct use of the funds without excessive intrusion in the *modus operandi* of the research groups, then multiple benefits will follow including a greater engagement of industry and a greater devotion of effort to the inventive side of research rather than the bureaucratic aspects.

ERAB recommends simplification ex ante the introduction of the research and support programmes focussed via the flagship project "Innovation Union"

ERAB recognises that the pressure to have a reasonable level of specific monitoring comes from other actors in the EU including the member states and the Members of the European Parliament. However the tendency to apply rules from one sector of EU support (e.g. Agriculture) to another (e.g. Research) ignores some crucial cultural and functional differences that underpin quite unrelated activities.

Notwithstanding the fact that some of the procedures are imposed on the Commission, those engaged in R&D funded through the FP'ss have the EC and its services as their interlocutor and hence the message in the communication from the Commission will attract very significant attention, not least because the Commissioner has identified simplification as one of her major goals.

The document is also an opportunity for DG Research to state the specificities of the actions that are delivered by its programmes and hence the need for administrative processes that are apt for its mission. Above all, research inherently carries an element of risk and in general the exact timing of delivery of steps towards a research goal cannot be predetermined accurately.

Although the general ideas behind a research programme are known at the outset, if the results are so predictable then there is little value in undertaking the research. Researchers explore the unknown and need to be fleet footed to take advantage of whatever unexpected results are found. In general, most researchers are driven by curiosity and not by financial reward in the first place and work in Institutes that are in turn heavily monitored in the national systems..

It should be noted also that those that receive an FP grant are frequent applicants for further support for related or new research activities. This means that their performance is examined not only ex post an award but again when a new application is made. With such a captive community, the negative consequences of inappropriate behaviour or failure to deliver on a grant are multiplied and would militate against that individual having a successful career.

ERAB has already urged in its first annual report that that these actions would include recognition of the inherent risk in research programmes. Also ERAB proposed that a code of ethics be drawn up for researchers which among other elements would take into account financial responsibility,

2. ERAB's Specific Proposals

Much in the document is very positive especially many aspects in strand 2 and we do not comment on them further. Our suggestions are focussed on the factors that arise from the particularities of the research domain and are informed by the discussions at the ERAB conference and by our collective and diverse experiences.

(1) Bring an immediate halt to the requirements for timesheets that monitor the time commitment of researchers to the project and sub themes within it.

The need to maintain timesheets for those employed to deliver a research project has become the symbol of "EC Bureaucracy ".It was the point made most frequently at the Sevilla ERAB Conference by researchers and heads of research institutes. Research is not a "nine to five" activity and even when away from the laboratory researchers invest considerable time reflecting on the problems they are working on, the data that they have produced and the new information they have read from other groups that has to be integrated into their work. Timesheets are not appropriate for this group or culture. Anecdotal information points to a low factual collaboration between the time sheet and the actual time spent. This is not because of a desire to act in a fraudulent manner but rather because of a mis-match between the reality of the practice and the presumptions, based on an industrial and manufacturing environment, that underpin the use of time-sheets. ERAB is convinced that the benefits of the timesheet process are minimal and the reputational damage to the EC is disproportionally high by the continued use of this tool.

ERAB believes that an immediate announcement of the discontinuation of the use of timesheets would attract very significant positive publicity for the Commissioner and the EC.

(2) Set targets for the time from application to time of grant and from decision to award to time to pay.

The Communication recognises (eg in section 3.1) the need to improve these parameters. It also anticipates reductions of several months in these times if some of the proposals are introduced. However a more powerful indication of the seriousness of intent would come from the publication of specific targets for each of these steps. By showing data for the current situation and monitoring the reductions in time achieved by the changes introduced, the EC would show that the impact of the measure introduced match the goals for simplification that are announced.

In addition, this move would introduce predictability into the system and this would be very important, especially for SME's that have to be very sensitive about cash-flow.

(3) Expand the use of prizes to minimise bureaucracy for the ERC.

The aims of the ERC are different from those of other parts of the FP. The Communication helpfully points out that prizes have been provided for in the financial regulations. These seem to be particularly appropriate for the awardees of funds through the ERC programme. It is recalled that the ERC was established and justified on the basis that competition between the best researchers in Europe would stimulate even higher quality research and hence those that are awardees are in effect 'winners' in a competition. Prizes are very appropriate given this construction of events. The fact that the applicants are individuals, adds to the appropriateness. And the research that is performed in the ERC funded laboratories is, by definition, at the frontiers of knowledge where there is and should be a high level of unpredictability and hence a greater difficulty of matching the research to the usual milestones and pre-defined deliverables associated with other parts of the FP.

Prizes therefore would address many problems, would receive very high visible appreciation from the awardees, would provide an opportunity for a Prize winning ceremony with attendant positive PR consequences and are very suited to this subset of the FP.

(4) Do not implement Strand 3 of the communication

Whereas there is an implicit benefit in terms of simplification if the focus moved to results based rather than cost based funding, it is a suggestion that does not match the reality of those involved in research activities. Put simply, an SME could not afford to take the risk that, despite performing all the research that had been proposed and accepted at the time of application, the results would be 100% in line with those anticipated.

It has been pointed out above that there is an inherent risk and uncertainty in research and hence this proposal would inevitably lead to a complete exclusion of many researchers, would result in research that was very predictable and incremental and often that is not research that has a high impact.

EUROPEAN RESEARCH AREA BOARD

ERAB's recommendation to maximise High Risk – High Gain Research in the next Framework Programme

In order to follow up on the European Research Area Boards' (ERAB) recommendation for the need for more frontier research in Europe as stated in ERAB's Annual report 2009, Chapter 5: "*An ERA to deliver excellence ... where risk-taking in research, regardless of its public or private origin, will be the guiding principle for ERA policy*", ERAB asked for a critical survey of how some of the most innovative public funding institutions worldwide support such research¹.

ERAB makes no distinction between so called fundamental or applied research including technical developments, all of which can involve high risk.

In order to increase High Risk – High Gain research and innovation in Europe, ERAB recommends the following:

1. Develop a “whole body” approach to Framework Programme (FWP) support across all aspects of high risk research.

Fostering frontier research requires a well balanced combination of institutional funding, conditions guaranteeing a long term stable research environment, mission oriented frontier research programmes and frontier researchers. This is illustrated in the matrix below.

An ideal policy integrates and supports all boxes:

Funding of	<i>Institutions</i>	<i>Programmes/Projects</i>	<i>Researchers</i>
Orientation			
<i>Fundamental, Curiosity driven</i>	-	-	-
<i>Applied, Challenge and Solutions driven</i>	-	-	-

So far European research policies are mainly focused on programmatic funding. Institutional funding issues are largely the responsibility of the Member States and will remain so for the foreseeable future.

¹ J. Leijten, H. Roseboom, R. Hofer (2010) "More frontier research for Europe. A Venture Approach for Funding High Risk – High Gain Research", Brussels, Joint Institute for Innovation Policy. The study explores how EU research funding models should be developed in order to contribute better to the realisation of more frontier high-risk research in Europe, **across** the whole spectrum of research. The study offers a state of the art literature review and an analysis of several funding schemes, funding organisations and general research policy initiatives.

Any future Framework programme should seek how to add European value to the mixed economy that exists between Member States. The European Research Council (ERC) is an excellent example of how this can be achieved. ERAB believes that the ERC model (if freed from the current bureaucratic constraints) should be considered for other areas of research, in particular for projects in emerging technologies. ERAB proposes the development of a portfolio vision on the whole set of different European and Member States' funding mechanisms (institutional, programmatic and bottom-up driven researchers funding) in order to create the best overall conditions for supporting frontier research in Europe. Particular attention should be given on how projects that cross or fall between the missions of funding organisations, such as those connected with grand challenges involving several disciplines and actors, could be supported without excessive bureaucracy.

2. Enable an active, flexible and entrepreneurial management of research programmes, with a strong orientation toward generating the best outcomes.

Research shows that the following factors foster or impede scientific breakthroughs:

<i>Factors fostering breakthroughs</i>	<i>Factors impeding breakthroughs</i>
Organisational autonomy	Restrictive institutional environment
Scientific leadership	Departmental differentiation
Mission-oriented flexibility	Bureaucratic coordination
Personalised recruitment	Filling positions
Intellectual diversity/multi-disciplinarity	Uniformity of intellect
Communicative integration	Compartmentalised communication
Cognitive complexity	Specialisation of the mind

A funding model geared to deliver high risk research, therefore requires:

- 1) interaction with researchers (and with other stakeholders such as EUROHORCS, European Technology platforms, large charities. etc.) in the programming stage by people that know how to challenge researchers and innovators;
- 2) flexibility in the development of the research, including opportunities to test ideas (both on application procedure and implementation of projects), good content related monitoring and evaluation, and the possibility to stop or to extend projects on the basis of how they perform and develop;
- 3) speeding up procedures, minimising the administrative burden and an overall shift of the focus from inputs to generating outcomes that demonstrate real added value in the form of key discoveries or practical solutions for example.

This requires mission driven programme managers with considerable responsibilities and powers who understand and can respond to the developing research/innovation environment without being restricted by unnecessary bureaucratic constraints.

3. Implementation of the FWP should be in the hands of outcome-oriented and mission driven institutions or management structures which are accountable for a well-defined and politically agreed set of strategic goals.

Several necessary elements of the ideal type funding model are not compatible with the existing political and policy making environment in the European Union although many Member States do take this approach individually. It is therefore surprising that the FWP tends to be so restrictive given individual Member States are happy to take a more hands off approach themselves.

ERAB therefore proposes that the next FWP will be managed by a set of independent institutions at arm's length of Commission and Member States influence similar to those that exist elsewhere. These would be governed by independent councils such as is the case of the ERC. To make this possible, revision of the Financial Regulation will be needed.

In theory the present European agencies could play this role, but in practice the existing regulations lead to a strong input orientation, administrative complexities and inflexibility.

It is recommended to let this system of European Union research funding institutions adopt the modus operandi which is common practice in many Member States such that:

1. A limited number of funding institutions with a clear task oriented mission, based on a scientific and technical research agenda, and implemented under strong management through a regularly updated strategy.
2. The overall strategy is agreed with the EC and Member States (including the overall amount of funding, priority areas, etc.).
3. A high level forum for agreeing on which funding institutions will contribute to projects that range across the missions of individual funding institutions whether at a national or European level. There should be a single point of contact for proposers of such projects.
4. The individual institutions will be accountable for their overall budgets to the EC but will develop their own procedures for working with individual programmes etc. in order to encourage high risk-high gain developments.
5. The execution of the strategy is determined by the institutions, though they are held accountable for the outcomes.
6. The judgement of a success or failure of a programme should be done against the real outcome of the programme in terms of new discoveries, new insights, new technologies or any other worthwhile impact on society.
7. Achieving high risk – high gain research, requires a research management and leadership willing to take high risks.

ERAB believes that unless there is a drastic change in how the FWP operates, Europe's ability to compete or cooperate in the global environment will significantly diminish. It therefore urges the decision making bodies in Europe to consider this issue a priority.

EUROPEAN RESEARCH AREA BOARD

ERAB views on achieving Cohesion in European Research and Innovation.

1. Excellence and Cohesion: Two sides of the same policy coin

Excellence and cohesion in research and innovation seem to be at odds with each other. Likewise there is no clear definition of what excellence means especially when applied and industrial research is involved. Peer review is seen as a gold standard for assessment however even that can lead to conservatism and a lack of risk taking. ERAB have already set forth their advice for supporting high risk - high gain research and to judge this both reviewers and funders must feel comfortable with the fact that a large proportion of initial objectives will not be reached. A better description of these projects might be ones that are of **“leading international quality leading to either new products or ideas.”**

Cohesion by contrast is focused on ensuring that all regions and institutions within the EU are able to operate at an international level. This includes sufficient support infrastructure, institutions with appropriate governance structures, suitable research and innovation management experience, and other support services to attract and maintain top human capital. There is a long way to go to achieve this objective and many regions are hampered by the lack of experience in operating within an internationally competitive market place.

So, are excellence and cohesion compatible? Some facts point to reasons to be concerned. Currently 96% of all ERC awards go to the “old” EU 15 and only 4% to the newer 12 Member States. Amongst the EU 15, some do very poorly; however, even in countries considered successful some institutes perform brilliantly while others are not visible. Although ERAB has argued for clustering of expertise to create innovation and research centres of critical mass, it is widely acknowledged that the EU does not optimise the use of its talent pool and a whole-body solution to solve this issue is needed.

Hard facts explain this sharp gradient of success:

- Member states have highly variable levels of R&D expenditure (from 0.4% to 3.7% of GDP),
- Some of the weaker performances can be attributed to the fact that only recently actual funding for R&I was available
- Because of low funding and a low priority there is a consequential poor research infrastructure in some member states
- These in turn become unattractive locations for the brightest ,even natives of these countries, to develop their careers
- Some countries suffer from procedures that were set up to suit non EU-conform political regimes and these are unresponsive to the new environment
- Researchers in some member states often lack experience at the whole business of grant application

- As many of the countries are new member states, they were excluded from networks of researchers that developed over the years
- There is a marked lack of appropriate management experience for coordinating large international programmes in many parts of the EU, that are results orientated and focused on delivering real solutions.
- Many researchers in several countries are responsible for managing research activities without having been exposed to the rigours of international research competition

How can we act here?

2. ERAB advocates a pragmatic approach to address the cohesion problem in R&I.

We need to act as not only the lack of cohesion is politically unacceptable, but also because Europe faces, as a whole, a weak global outlook (80% of Researchers, 75% of Investment and 69% of patents come from outside Europe). Increasing cohesion will thus serve a double ambition: raising the position in the playing field for all Europeans and helping Europe to become globally stronger in the field of R&I. The overall aim should be to raise standards and expectations and avoid any form of levelling down.

Focussing on developing the European research Area such that all the EU's assets (and hence the need for Cohesion) are used, ERAB recommends to:

1. Ensure that 30% of Structural funds go to R&D and its infrastructure.
2. The matching funds for Structural Fund investment relevant to R&D should be reduced compared to those for other projects.
3. The "return on investment" assessments of the Structural Funds used, should include an appreciation of the intangible assets (including people, the attraction of excellent research groups and infrastructure, specialist knowledge, etc.) associated with Research. Otherwise roads and bridges will win every time.
4. It is clear that both, policy makers and researchers in many new member states must gain hands-on experience in managing and operating large international infrastructures. Member States with Structural Funds should be encouraged to support researchers and project managers and perhaps look to building national infrastructures or investing in existing ones elsewhere for training purposes and to be able to credibly bid for international physical infrastructures in the future. Regions with extensive Structural Funds could be encouraged to host the management of distributed infrastructures as soon as possible.
5. The strong countries should open up their research funding schemes to scientists in the weaker countries.
6. A special competition, judged on the basis of excellence, restricted to scientists from the weaker regions should be established to mirror and complement those currently at the ERC for a limited time period of 10 years as a tapered programme. Ideally it should be a new strand of the ERC; just as it recognised the need to have a special competition for early stage researchers to ensure that their potential would not be crushed by the competition from the long established groups. The same applies to scientists working at present in poor research environments. As a result the percentage of all ERC awards

- going to the newer EU 12 member states would be expected to gradually increase from the present 4% to some 20-30%, if this approach is successful.
7. Special incentives should be in place to encourage researchers to set up partner collaborations with weaker regions.
 8. Those from the less performing countries, who successfully compete for ERC grants, should get a bonus grant to improve their infrastructure.
 9. Countries should use procurement methods to develop research capabilities that match their needs.
 10. Linkages should be promoted and supported (with real incentives) between the Universities in the “strong” and the “weak” countries.
 11. Make (part of) EU co-funding in the context of the Structural Funds conditional to procurement of innovative technologies and R&D, also as a means of gearing cohesion policy more towards stimulating R&D and innovation.
 12. Public procurement of new technologies, products and services should be used as a tool for initiating new collaborations between stronger and weaker regions.
 13. Special incentives should be made available to encourage improving the governance structures of many institutions, to make them more responsive to international research and innovation demand.

These points are by no means exhaustive and some proposals on the list require clarification and expansion. However ERAB strongly thinks we need to start somewhere and now. We know the problem; we know the reason why it exists and we also know that “business as usual” will only aggravate the inequalities that exist.

EUROPEAN RESEARCH AREA BOARD

ERAB views on Social Innovation

1. Times are changing

The world of S&T and Innovation is witnessing a range of changes related to social innovations. Open innovation brought more diverse, distributed and cumulative innovation patterns. The principle of open access to publications, in an increasingly multi-polar world environment, generates new possibilities for research to feed innovation. More in general the label 2.0, usually associated with web applications that favour social interactivity and user-centred or driven design, could be grafted into a Research-Science 2.0.

Recent European reports recognise the contribution of social innovation to the overall economy and define it as innovation which is social "both in its ends and its means". Therefore, social innovation is not only responding to social needs and addressing societal challenges but also improving the capacity of society to act and innovate¹. It hints at end-user driven, bottom up, cross-cutting collaborations and in doing so increases the social capital and strengthens the resilience of society.

The Innovation Union flagship relates the dynamics of Social Innovation to an observed need to "rethink" R&I away from the "business as usual"². This echoes the first ERAB report "Preparing Europe for a new Renaissance" (2009) which also advocated for a new way of doing research, but also for a revolution in science and new types of relationships between human beings, between human beings and knowledge and technology, and between human beings and culture.

Recent developments in academia, the labs and industry, indicate an inexorable progress towards more open, dynamic, shared, distributed and networked systems and processes. Closed circuits and pyramidal relationships seem features of the past. In particular:

- Innovation is increasingly delivered as a collaborative process accumulating capabilities, embracing all domains and involving many more elements beyond technological change;
- Open source and wide cooperation and coalitions become common practice for innovation;
- The whole planet (and increasingly the emerging countries) becomes a research and innovation laboratory;
- Policy makers have to face new challenges and limited resources could become a compelling driver for innovation and change.

But Social Innovation is also needed in the sphere of governance: governance of science, governance of society, governance of institutions, governance of partnerships and networks. Distribution of research funds, private investments should be approached from a social

¹ Including the recent Commission reports "Empowering people, driving change: Social innovation in the European Union" (BEPA, 2010) and "This is Social Innovation in Europe" (DG Industry & Enterprise 2010)

² Europe 2020 Flagship Initiative Innovation Union (adopted by the EC on 6.10.2010)

innovation perspective. Classical in-put/out-put formula does not work anymore. Financial crisis and reduction of research spending will trigger thinking in the direction of do more with less. Thus, Social Innovation should help creating new approaches and policies in order to deliver efficient science financing mechanisms.

Finally, Social Sciences and Humanities have to play a leading role in Social Innovation because they have accumulated the best knowledge on societal needs and interests, social behaviour, as well as institutions and organisations. They can play much more active role in adopting the earlier suggested multidisciplinary approach and in setting agenda for science and defining research priorities across the whole spectrum of sciences, as well as serve as driving force behind Social Innovation.

2. The challenge

ERAB sees the contribution of Social Innovation dynamics as vital for enhancing collective R&I intelligence (e.g via crowd sourcing) and knowledge harvesting which are urgently needed to maximise and spark Europe's research and innovation thinking and processes. The power of networks and bottom up approaches could bring important added-value to the research and innovation systems, especially in addressing grand challenges. But, it also means a challenge for our innovation systems as they have institutionally to adapt to the changes associated with Social Innovation.

Therefore European Union decision makers are encouraged to reflect on the following questions:

- How to ensure quality and promote excellence in this evolving context of R&I? (Who will be the new 'gate keepers'?) What are the new filters and standards?
- How the above developments impact on priority setting, evaluation, financing, regulation and governance?
- What would be the conditions for the R&I systems of the future to be more adapted to the needs and wishes of researchers and innovators?
- How the present EU R&I ecosystem can overcome inertia and be best opened up through social innovation?
- What would be the impact of open and distributed R&I processes in disseminating a risk culture and what the role of IPR?
- What could be the role of Social Innovation in reforming/opening/innovating the next R&I Framework of the European Union?

RECOMMENDATIONS

To answer these ERAB recommends:

1.) **Wake up, now!** Establish a "think tank" with young excellent researchers and research policy makers, members from the publishing world, IPR-world etc. to inform "established policy makers" on the changing environment for Research and Innovation. These changing frame conditions will be most relevant and useful for the design of the "Future Framework Programme for Research and Development";

- 2.) **Stimulate Research into Social Innovation:** As part of the CSF we suggest a topic "Research into Social Innovation";
- 3.) **Create a clearing house for Social innovation:** The EU could create a data base of Social Innovation that could serve as a tool for the implementation of Innovation Union accessible to interested partners.

EUROPEAN RESEARCH AREA BOARD

ERAB views on the role of International Collaborations

Rationale

Europe is facing an unprecedented urgency for global collaboration due to grand challenges menacing mankind. Research is indispensable to manage the challenges, but can succeed only if the efforts are supported by coherent policies. Recent political movements to strive for democracy in the Arab world, and the immediate political effects of the nuclear power plant demolition caused by the earthquake in Japan demonstrate that all research domains, from technology and engineering to social sciences and humanities are instrumental to address the challenges we can identify today, as well as the disruptive challenges of the future. Global inter-dependence requires global actions.

For research to contribute to the development and cohesion of our societies and adaptation to economic and demographic changes depends not only on building a strong European Research Area, but also on developing strategic and reciprocal activities with other regions of the world. International scientific collaborations are a means of accessing research resources and infrastructures, teaming up with professionals with complementary competencies, benefitting from knowledge generated beyond boundaries, capitalising on aggregated financial investments and achieving critical mass to tackle grand challenges. Delivery of meaningful findings, discoveries and innovations will build trust among people, societies and countries and contribute to global peace and prosperity.

As the grand challenges are global, also the solutions need to be global. Uncoordinated activities and isolated bilateral agreements lead to duplication of efforts, fragmentation and waste of resources, resulting in a loss for the whole of Europe. Several high-level reports from the European Commission and other stakeholders have identified problems and issued recommendations. However, political commitment, allocation of resources and creation of novel tools have remained insufficient.

Europe has a long tradition in international relations, both in public and private sectors, yet currently not systematised and optimised in the research and innovation context. Consequently, the results of many European investments in research and innovation, such as trained researchers and patented inventions, are often exploited first elsewhere than in Europe. While many EU Member States have economic interests abroad and engage in bilateral partnerships with other countries or regions of the globe, they fail to reap the tangible and intangible benefits that a strong, pan-European approach would yield.

It is time for the European Union to trigger a paradigm shift, design a coherent strategy for international collaboration with ambitious targets, create new opportunities for itself and its

partners, commit to implementation and monitor impact, to ensure that Europe remains a key player in the international arena. Europe should speak with one voice with its global partners.

Recommendations

ERAB proposes to promote comprehensive, common research and innovation policies for global collaboration, based on grand challenge themes pertinent for the specific partner(s) in order to link policy directly to implementation.

To achieve this, Europe should:

1. foster scientific exchange and collaboration based on dialogue and trust as a form of science diplomacy in order to advance peace and democracy at a global scale.
2. anchor collaboration on specific grand challenge themes pertinent for the particular partners (such as water for collaboration with India), incorporating all stakeholders of the research and innovation ecosystem.
3. strengthen the global knowledge framework within which European firms operate by expanding the policy instruments for companies to support complementary collaboration beyond the European Union.
4. build global links between the science/ technology communities and the social sciences/humanities communities, as all grand challenges concern societies.
5. promote collaboration between academia and industry in the spirit of open innovation in Europe and beyond.
6. boost researchers' geographical, inter-sectorial and public-private mobility in and outside Europe, eliminating once and for all the current bureaucratic barriers and creating attractive research environments and working conditions.
7. provide incentives to open European and national research programmes to non-European scientists both in a reciprocal fashion and for capacity building.
8. optimise investments in and ensure access to international research infrastructure facilities for excellence and cohesion, and capitalise on opportunities offered by e-infrastructures.
9. map existing instruments for international collaboration in research and innovation at the global level, so as to integrate them and address unmet needs.
10. develop a global code of conduct for research integrity, to serve as a fundamental basis for international collaboration.

11. increase international visibility of Europe as a first-choice partner for collaborations worldwide through tailored actions and meaningful presence in decision-making bodies.
12. create a global science policy forum for policy makers and key actors of all global regions to benchmark best practices and achieve consensus on framework rules and policies for international research collaborations.