



European  
Commission

# The new Renaissance: will it happen?

## Innovating Europe out of the crisis

Third and final report of the  
European Research Area Board  
2012

*Research and  
Innovation*

EUROPEAN COMMISSION

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## **The new Renaissance: will it happen? Innovating Europe out of the crisis**

### **1. Introduction**

The European Research Area Board (ERAB) was established in December 2007 with a mandate to provide the European Commission with advice on how to make progress towards a European Research Area (ERA). In 2008 the members of the Board were nominated in their personal capacities from the different stakeholder groups, from industry to academia, that play a role in European research. They were asked to think outside the box, to challenge assumptions and existing or planned programmes and to "avoid being sucked into looking at Commission processes".

The Board has maintained its independent perspective during its four-year mandate. Its first annual report ("Preparing Europe for a New Renaissance – a Strategic View of the European Research Area"<sup>1</sup>, 2009) focused on the question of how a successful European Research Area would look like in 2030. The report argued that the EU needs a different science and innovation system to underpin a new growth model.

The report listed 30 success indicators for a performing European Research Area by 2030, and assessed the scope of action for the Commission to achieve it. The report states in its conclusions:

*"We are concerned by the fractured state of the ERA today: (it is) still too much driven by inward national policies (...) In view of the challenges our planet and Europe faces, we must act and act now. Otherwise, Europe will not only become marginalised in a global market, but will fail to contribute to solving our greatest challenges."*

While the first report was visionary and optimistic, the second report ("Realising the New Renaissance"<sup>2</sup>, 2010), provided a set of recommendations for action which had been previously discussed with a broad stakeholder base at the ERAB conference ("Preparing Europe for the New Renaissance", Seville, 6-7 May 2010). The report was ERAB's response to the challenge set by the Research and Innovation Commissioner to list the top ten priorities for ERA policy.

ERAB has produced 12 position papers with recommendations on specific issues. Several of them formed the basis of ERAB's response to the consultation on the Green Paper "Towards a Common Strategic Framework for EU research and innovation funding"<sup>3</sup>, where the Board raised a critical voice about the consultation questionnaire. Recent papers tackle venture capital for research and innovation, international collaboration, cohesion, social innovation and how to maximise high-risk high-gain research and innovation.

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<sup>1</sup> [http://ec.europa.eu/research/erab/pdf/erab-first-annual-report-06102009\\_en.pdf](http://ec.europa.eu/research/erab/pdf/erab-first-annual-report-06102009_en.pdf)

<sup>2</sup> [http://ec.europa.eu/research/erab/pdf/erab-2nd-final-report\\_en.pdf](http://ec.europa.eu/research/erab/pdf/erab-2nd-final-report_en.pdf)

<sup>3</sup> (COM (2011) 48)

In addition to its advisory role, the Board has undertaken advocacy activities and its members have been asked to speak in many events around the world.

In December 2011, ERAB hosted a session at the first European Innovation Convention in partnership with the European Forum for Forward Looking Activities (EFFLA) and the Innovation for Growth group (I4G). The content of this brainstorming is summarised in Annex 2.

This is the last report of the Board; it compiles in one document the recommendations produced in the last 16 months and constitutes a legacy for the new configuration of the advisory group, which will be called the European Research and Innovation Area Board and will start its work in 2012.

We have been fortunate to deal with two extremely supportive Commissioners and committed Commission services.

## **2. Innovating Europe out of the crisis**

This section presents the key messages discussed at the ERAB-hosted brainstorming session held at the Innovation Convention in December 2011. The session was attended by 150 people representing the scientific community, national policy makers and the business sector.

### **2.1 Addressing grand challenges by pooling resources in times of crisis**

Addressing Grand Challenges by pooling research resources at European level is about striving jointly for sustainable solutions to economic, political and societal problems that might alter the future of the Union. Today's challenges are as political as ever, but have a scientific and technological dimension that offers a new window of opportunity to strengthen shared responsibilities and encourage Member States to embrace joint action.

Pooling research capabilities will drive integrated science, covering the whole cycle from basic research and scientific training, to applied research and all the way to innovation. This strategy implies strong links and feedback between every stage of the innovation cycle – thus creating a research ecosystem which is not common in Europe at the moment.

Last but not least, pooling resources will allow for more efficient allocation, avoiding fragmentation and duplication. This is a prerequisite when it comes to deliver breakthrough solutions that depend on extensive critical mass multidisciplinary collaborations. And it is particularly important in times of economic crisis and restricted public budgets.

The governance and management of the organisations set up to drive Grand Challenge programmes will be crucial to ensure the commitment of all partners and the alignment of their instruments towards a common funding goal. In the same spirit as the debate on the establishment of European Innovation Partnerships (EIP), this should be the task of independent mission-driven agencies which are accountable for the agreed strategic objectives. These agencies should be run at arms-length from the EC and Member States, offering a platform where stakeholders engage in a real dialogue.



The European Commission should act as a catalyst and facilitator in pooling both national R&D investments and a substantial share of Structural Funds for research.

## **2.2 Maximising the contribution of social sciences and the humanities to innovation**

The ambitious goals defined by the Innovation Union<sup>4</sup> cannot be achieved without the contribution of social sciences and the humanities (SSH); since they contribute to an improved understanding of innovation processes, they help to make effective policy decisions and they have a fundamental role in minimising the negative social effects of technological change. They are also a key component of the development of new products and the evolution of new markets; understanding of human behaviour is more important than ever in economies that compete globally.

SSH have a strong affiliation with the creative industries. They communicate technical complexity in an efficient way, and contribute to changing social perceptions that in turn create favourable environments for innovation. They create the spaces for a public debate on what we want to achieve as a society and which tools will take us there. SSH can also help explain, or foresee, when technologies are simply not taken up. They help us remember that technology has to be useful for people, not the other way around.

It is still unclear how SSH are embedded in Grand Challenges in Horizon 2020<sup>5</sup>, and their potential impact on R&I agendas. In this sense, Horizon 2020 is a missed opportunity but the community also needs to understand that it cannot just exist in its own silo and must be seen as integrating into the whole innovation cycle.

The current buzz on social innovation is a wake-up call on the role of social sciences and the humanities. New, more efficient local and global networks are changing the world and transforming traditional approaches to research policy. The power of networks and bottom-up approaches, such as in crowd sourcing, needs to be used in support of EU innovation objectives.

Europe faces a fundamental challenge regarding the sustainability of its social model in a context of demographic change and rising unemployment. Science and innovation exist in a cultural background that determines collective goals. Horizon 2020 may need to find ways to pay more attention to this.

## **2.3 Developing the international dimension of the Innovation Union**

Global inter-dependence requires global actions. Europe needs not only to build a strong research and innovation area, but also to develop joint activities and synergies with other regions of the world.

International scientific collaboration allows for increased access to research resources and infrastructures, provides exchanges with professionals with complementary competencies and

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<sup>4</sup> [http://ec.europa.eu/research/innovation-union/index\\_en.cfm](http://ec.europa.eu/research/innovation-union/index_en.cfm)

<sup>5</sup> Horizon 2020, the Framework Programme for Research and Innovation (2014-2020).

[http://ec.europa.eu/research/horizon2020/index\\_en.cfm](http://ec.europa.eu/research/horizon2020/index_en.cfm)

capitalises on aggregated financial investments. Sharing knowledge builds trust amongst people and societies, contributing to global peace and prosperity.

Funding organisations should provide resources for cross-border programmes beyond Europe and open up their programmes to non-European researchers in a reciprocal fashion, particularly for capacity building. Principles of assessment of excellence and relevance, as well as of research integrity and ethics should be shared globally.

While many Member States have economic interests abroad and engage in bilateral partnerships with other countries or regions of the globe, they fail to reap the benefits of a strong, pan-European approach. It is time for the EU to design a coherent strategy for international research collaboration with ambitious targets, ensuring that Europe speaks with one voice and remains a key player in the international arena.

Europe needs to define priorities for international cooperation in terms of regions and themes. The Strategic Forum for International Cooperation (SFIC) has proposed pilot actions with China, India and the US on specific fields of mutual. The Commission and Member States need to agree on how these priorities will be defined and implemented in the future.

At the same time, Europe needs to work on scientific human capital. The EU is a stimulating place to do research, but it is falling behind in attracting and retaining talented researchers. Barriers to researchers' mobility need to be eliminated, now. Europe needs to be able to present itself as one research territory with a diversity of opportunities and centres of excellence. Otherwise the results of EU investments, such as trained researchers and patented inventions, will continue to generate benefits outside Europe.

### **3. A last word from individual ERAB members.**

#### **Reinhold Achatz**

For the European Research Area we need performance oriented, unbureaucratic and trust-based research management.

#### **Robert Aymar**

In order to build ERA, Member States need to evolve from their national research focus and pool resources across borders to implement jointly strategic programmes. For Member States to trust this approach each joint programme must be governed by an independent agency and implemented by mission-driven management structures. The EC should act as a catalyst and a facilitator.

#### **Lajos Balint**

E-Infrastructure is a key component of the European Research Area; it integrates disperse research resources, allows for remote access, and enables the creation of global virtual research environments and communities.

#### **Jean Botti**

In order to truly unleash innovation across Europe, we cannot treat all EU nations equally in terms of their innovative potential; this is neither practical nor realistic. A paradigm shift is needed in Europe if we are going to achieve the rise of the private-entrepreneurial creative

class to address issues concerning, sustainable development, information technology, alternative energy, etc

**Adelheid Ehmke**

ERA must ensure equal opportunities and access to funding irrespective of gender, age and race in order to exploit the full potential of all researchers – not in theory, but in practice.

And ERA needs simplification of procedures and continuity!

**Anne Glover**

Europe's significant investment in research can generate even more value for its citizens *only* if the EU is *also* prepared to invest in the creation of innovative, high growth enterprises - by providing patient, long term capital through a non pari-passu VC oriented, fund-of-funds programme.

**Barbara Haering**

At the end it is all about creating passion for science and innovation – and about our shared responsibility regarding the Grand Challenges Europe is facing.

**David King**

Since crude oil production is now inelastic, causing wild price swings and being a major contributor to the current Euro crisis, an urgent new R&D effort is required to move our economy away from fossil fuels.

**Leif Kjaergaard**

In order to remain a world leader in knowledge-based societies the EU needs to get real industry involvement in its R&D&I activities – this does not mean that industry shall lead these R&D&I activities.

**Marja Makarow**

The Innovation Union must include relevance in the criteria for excellence, not as a prerequisite but as inspiration, to catalyze disruptive innovations emerging from frontier research.

**Zaneta Ozolina**

Europe's core values are the only firm foundation Europe feels safe on when it experiences turmoils. These values have to be cherished, and commitment to them must be reflected in routine actions of the EU, counterbalancing the prevailing pragmatic policies.

**Christina Pedicchio**

Europe should speak with one voice.

**Alain Pompidou**

The challenge for ERA is to bring more consistency among Member States through better coordination of research programs and less bureaucracy, while taking into account the excellence criterion and socio-economic needs.

**Carlos Romeo-Casabona**

The main objectives of ERA should be to implement excellent, inclusive, funded (but unbureaucratic) and open cooperation among European public-private research teams. We need ERA.

**Luc Soete**

Innovating out of the crisis!

**Unni Steinsmo**

We must create a continuous innovation chain linking education, research and industry and the public sector. We need strong interaction, public -private partnerships, a Europe attractive for industrial investments, in order to rebuild the economy and create the jobs for the future.

**Lena Torell**

ERA needs to focus its ambition and open up for new economic possibilities by addressing the Grand Challenges in excellently managed and innovative research programs making use of public-private partnerships.

**Jan van den Biesen**

To unleash the purchasing power of the public sector, achieve the 10 billion euro target for procurement of innovation in the Innovation Union, gear cohesion policy more towards R&D and innovation, and help Europe out of the crisis, Member States and regional authorities should explicitly mention procurement of innovative solutions as a possible activity in their Partnership Contracts and Operational Plans for the Structural Funds 2014-2020. This would provide national, regional and local procurers with EU-cofunding via the Structural Funds as an incentive to engage more in procuring innovative solutions.

**Georg Winckler**

The European Research Area needs to be quickly implemented and needs a paradigm shift in the way Europe undertakes research: towards more creativity, more excellence and more efficiency.

**John Wood**

It is urgent that the EC and Member States develop an appetite to take risks and take the ERA forward to address the future of our planet and its people.

**Ingid Wünnig Tschol**

A trust-based, highly professionally managed and simple grants system will encourage the most creative researchers worldwide to stay in and come to Europe.

**Nuket Yetis**

Facilitating the mobility of researchers is a prerequisite for enhancing transnational research collaboration in Europe.

## **4. Conclusions and lessons learnt**

Preparing and Realising Europe for a New Renaissance by 2030 has been the ground base of the work of ERAB. The two published annual reports have been widely disseminated and quoted globally and it is flattering to hear some of the milestones and recommendations being played back to us. However, the real work of ERAB has largely been in the two page papers with concrete recommendations that have been submitted directly to the Commission. Readers of this report have an opportunity to read those submitted between December 2010

and December 2011<sup>6</sup> in Annex 1. The recommendations should provide the jumping off point for any new board succeeding ERAB. Among themes not covered but which were starting to be discussed are the need to encourage the acquisition of high-tech skills for industry, a further analysis of the impact of social networking on innovation and the dynamics of research, and the skills and technologies required for the individual innovator of the future. There is no doubt that further reflection on how Europe will contribute to the rapidly developing global environment will be a focus of much activity. One of ERAB's main recommendations was that there should be a global forum for sharing and taking decisions about the Grand Challenges facing society and discussion have already started on this idea.

After four years work, what has ERAB achieved? This is for others to say but just in terms of actions promised by the Commission and other Member States, the majority of our recommendations are being pursued in one way or another, with a greater or lesser degree of urgency. At this stage it is not easy to see which ones will reach fruition on the ground and there has always been a sense of frustration in ERAB about how long things take to reach reality. But as if the Commission understood our feelings, President Barroso announced the name of the first chief scientific advisor (one of ERAB's first recommendations) for the EU in December 2011, over two years since the first announcement of his intention to do it. Another concrete encouragement has been the announcement from most Member States to create a single European Patent (after more than 20 years discussion). If the European Research Area (albeit in a more restricted way than ERAB considered) is to be a working reality by 2014 much has to be done. Announcements regarding the need to encourage pre-commercial public procurement of R&D and commercial public procurement of innovation and the development of a framework for European Venture Capital Funds seem to progress in line with ERAB's recommendations and we look forward to their realisation. Along with many others the recommendation to increase the funds of the European Research Council and to solely focus on excellence has been taken forward and is one of the major successes of Europe.

Where have things not progressed? The fundamental idea of taking more risks with research and development projects, in order to promote disruptive findings and applications, seems to be resisted. The current institutional EU system seems paralysed by the political necessity to avoid mistakes rather than managing risks. Member States and Members of the European Parliament must ensure that failure to achieve what seemed like a good idea when a research proposal was submitted but did not work is not a reason to impose crippling constraints. If we are confined to "safe" projects that are merely written to stand up to intensive auditing then Europe will fall further and further behind. Rules for research and innovation funding should be streamlined to a level which is common across Member States and no more. Getting this right is critical.

Other recommendations that have yet to be taken up are: the creation of an annual "City of Innovation" to create a critical mass, holistic and transferable technology or social innovation to make a step change in the way we innovate and live; the creation of independent arm's length EU agencies to support research, innovation and research infrastructures; and the development of a scientific ethical code to encourage the responsible relation between researcher and the general public. Others could be cited. There is an urgent need for a change in momentum, and innovating Europe out of the crisis could be the push that is needed.

In view of the launch of a new form of ERAB, we would like to emphasise the need for a larger dedicated team in the Commission that can support the discussions of the Board,

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<sup>6</sup> Previous ERAB views can be found at [http://ec.europa.eu/research/erab/index\\_en.html](http://ec.europa.eu/research/erab/index_en.html)

providing information to underpin and elaborate the Board's recommendations. We would also like to insist on the need for constructive feedback from Commission staff. ERAB has fearlessly maintained its independence and realises that some of its recommendations might be too radical or impractical. Indeed it would not be living up to its mantra of more risk taking if it did not. But a continued exchange of views and information is crucial; it can contribute to targeted recommendations and to an appropriate monitoring of the implementation of initiatives.

We, members of ERAB, have all been firm in trying to communicate the truth as we see it. It is a mark of a true democracy that it can be challenged in this way. It was also a mark of the first Renaissance and should be a mark of the New Renaissance for Europe, or as we say in the first report:

*"...a new resolution: to make the European Research Area a byword for creativity, excellence and efficiency – and the catalyst for a new Renaissance in the way we think, act and research globally(...) .a new Renaissance, a paradigm shift in how we think, live and interact together".*

This is the only way out of our present crisis.

# Annex 1

## ERAB recommendations December 2010 - March 2012

March 2012

### ERAB recommendation on research and innovation policy for Grand Challenges

*Delivered after the end of ERAB's mandate on behalf of the chair only*

In its 1<sup>st</sup> Report (2009) ERAB advocated that Europe needed a New Renaissance as a future societal model and to get there ERAB argued that Europe needed more than ever its S&T&I base to meet the Grand Challenges.

ERAB advocated that Grand Challenges involve a combination of major public and private interests, key for realizing future economic growth. Grand Challenges are not to be defined, assessed or solved by any single scientific or technological discipline or within one specific sectorial policy framework. To meet the Grand Challenges, new policies, new governance models, new innovation solutions and strategies and new investment models are needed. Grand Challenges involve many different stakeholders, are multidimensional, trans-disciplinary, systemic and they require new ways of thinking which go beyond traditional frameworks and disciplines. And they lead to a need to re-think research and innovation policy. Putting the Grand Challenges approach at the heart of Europe's R&I strategy is therefore more than a thematic prioritization.

ERAB is pleased that today, the Grand Challenges approach is widely accepted in European policy making and that it is one of the key building blocks of the EU Framework Programme for Research and Innovation 2014-2020 (Horizon 2020).

In its final working year ERAB discussed how to strengthen the European Grand Challenges approach in S&T&I as it felt the discourse on the Grand Challenges also needed to be translated into reality. ERAB therefore commissioned a study to explore to what extent there is evidence for a shift towards a challenge driven research and innovation approach and if so, how selected countries around the world translated the approach into reality<sup>7</sup>.

### Recommendations

#### 1. A comprehensive approach is needed

Where in Europe the Grand Challenge approach is translated into a jump to (fundamental) scientific challenges, the USA has a stronger focus on jumping to technologies and creating longer term industrial opportunities.

Most Asian countries however, develop a more *Comprehensive approach*, building on their tradition of national priority setting. This comprehensive approach aligns university training, scientific research, technology development, industrial innovation and social organization for

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<sup>7</sup> *'Investing in Research and Innovation for Grand Challenges'* by Joint Institute for Innovation Policy (JIIP), January 2012.

a systemic transition towards green *growth*, green *industry* and green *employment*.

*ERAB recommends a comprehensive R&I approach for the Grand Challenges.*

## **2. A demand led approach to be followed.**

The wealth of regional and local R&I policy initiatives in Grand Challenges like health, point to a strong interest at the level of innovation and diffusion of innovations in market and society. Fostering and “up scaling” initiatives at this level may prove to be very beneficial for the goals of research excellence and industrial growth and leadership as well. It may turn a challenge field into a highly dynamic and demanding market which triggers the development of new institutions, organizational innovations, new technologies and fundamental research questions.

*ERAB recommends that R&I policy for the Grand Challenges follows a demand led approach.*

## **3. EC leadership is welcome**

Going through the policy documents of Member States and backed by ample reference to European Commission and Union documents, there is a relatively strong consensus at Member State level about the nature of the challenges. This provides *an opportunity for stronger guidance and/or process management by the European Commission*, even when many of the challenges are part of policy domains which largely fall under the Member States’ responsibilities.

*ERAB recommends to reinforce and to speed up the Joint Programming Initiatives, to make them more ambitious and call for larger coordinated investment from the side of Member States.*

## **4. An arm’s length agency to implement the programs**

When implementing R&I programs in Europe, the setting up of arm’s length agencies, as advocated by ERAB in its Common Strategic Framework (CSF) advice (2011), is recommended.

Examples from the agencies in the US and the private sector initiatives show us that a degree of political and organizational independence from changing governments and administrations usually leads to more effective programs.

The agencies should not so much be seen as (research and innovation) funding bodies, but rather try to be “change agents” or “trans-institutions”, building upon the relatively strong and stable political consensus with regard to the specific challenge. Each agency requires a platform/mechanism where the different stakeholders can engage in real constructive dialogue.

*ERAB recommends exploring how the European Innovation Partnerships can fulfill a role in setting up of a more agency based approach.*



## ERAB views on venture capital

ERAB has issued two recommendations<sup>8</sup> on the role of Venture Capital (VC) in R&I. In its current recommendation ERAB addresses the role of VC in the early investment stages of innovative entrepreneurs. The key question is how to support private innovative technology/knowledge based business activities to come out of universities or public research institutions and how to make them grow into SMEs. Looking at the US experience, it seems to ERAB that the critical issue is to bring technology and knowledge out of the public research domain and to transform them into business activities.

For this purpose, also the assessment of markets for IP and the support of funds merit public policy attention. Furthermore, private VC expertise should be used by public financial institutions in assessing technology.

ERAB reminds the different *types of VC*: independent VC, Corporate VC, bank-controlled VC, university VC and governmental VC. Each of them shows different investment patterns and behaviours in coaching the activity into which they have invested. Particular attention should be paid to:

- The strength and specialisation of Governmental VC in investing in small, young firms, albeit with limited mentoring activities.
- Independent VC's specialisation in expansion investments in relatively older and larger firms, with a heavy impact on the management of the target firm.
- Corporate VC and their seed finance departments observing new technological innovations in SMEs aiding the renewal of their technological base and fostering their innovative technological growth.

ERAB highlights, based on the US experience, that VC finance of research and innovation based firms require an *eco-system of financial and non-financial activities*:

- The *financial activities* require large scale and continuing support.
- The *non-financial activities* of skill development of investors are of high importance.

ERAB recommends:

- Concentrate on public support activities on the *early phase* of technology firms by fostering the "ecology" and developing the environment of "institutions" by supporting a mixture of capable financial and non-financial institutions.

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<sup>8</sup> ERAB views on the role of Venture Capital for the R&I strategy, Brussels April 2010, [http://ec.europa.eu/research/erab/pdf/erab-view-on-venture-capital\\_en.pdf](http://ec.europa.eu/research/erab/pdf/erab-view-on-venture-capital_en.pdf)

Realising the New Renaissance, policy proposals for developing a world-class research and innovation space in Europe 2030. Second report of the European Research Area Board, P. 14 and 15, Brussels 2010: [http://ec.europa.eu/research/erab/pdf/erab-2nd-final-report\\_en.pdf](http://ec.europa.eu/research/erab/pdf/erab-2nd-final-report_en.pdf)

- Support the *growth phase* of enterprises through increasing public demand: as VC behaviour is much geared to that demand, public policies supporting Grand Societal Challenges and public procurement<sup>9</sup> are essential to the success of European VC.
- A well functioning VC market requires a *long-term systemic approach* to build up the VC ecology. Even compared to the US, Europe has plenty of new firms entering the market place, but they fail to grow. Therefore, public policy should particularly focus on enabling growth, and not only on removing entry barriers. A stepwise approach should be taken as follows:
  - Step 1: Improve capacities of investors and entrepreneurs
  - Step 2: Strongly align policy with rewards for success
  - Step 3: Government should focus on long-term indirect benefits (learning, spillovers, and increased tax revenue) rather than direct returns.
- EU policy should not be pushing development of a “VC sector” in each region and Member State. However, transnational capability development in VC firms and early stage investors should be supported.
- At national/regional level ERAB recommends:
  - Increase focus of investment readiness of high-potential individuals/firms;
  - Foster business angel networking and its professionalization;
- At European level ERAB recommends:
  - Provide catalytic, substantial commitments to a few major Funds-of-Funds under private management;
  - Offer such commitments as public co-financing in an incentivized structure so as to boost returns and attract private sector institutional investors back into VC;
  - Refrain from imposing geographical or thematic constraints or political objectives on such Funds-of-Funds;
  - Create a viable cross-border VC market without double taxation instead of promoting sub-critical ‘regional’ VC funds via the Structural Funds;
  - Reward success rather than subsidising failure (“backing winners”);
  - Enable start-ups to grow and move up a ‘funding escalator’;
  - Foster European level VC funds with sufficient flexibility to adapt to longer-term investment trends.

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<sup>9</sup> ERAB views on the role of Public Procurement for the R&I strategy, Brussels April 2010, [http://ec.europa.eu/research/erab/pdf/erab-view-on-procurement\\_en.pdf](http://ec.europa.eu/research/erab/pdf/erab-view-on-procurement_en.pdf), see also: Realising the New Renaissance, p. 9 and 10.

## **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 follow the 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.

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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);
- 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:

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

Table: Possible architecture for the CSF

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.

## **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.



## **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.

## 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 innovate<sup>10</sup>. 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"**<sup>11</sup>. 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 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

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<sup>10</sup> 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)

<sup>11</sup> Europe 2020 Flagship Initiative Innovation Union (adopted by the EC on 6.10.2010)

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.

## 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 research<sup>12</sup>.

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:

<i>Funding of</i>	<i>Institutions</i>	<i>Programmes/Projects</i>	<i>Researchers</i>
<b><i>Orientation</i></b>			
<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

<sup>12</sup> 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.

foreseeable future. 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.**





## **Annex 2**

### **Background information for brainstorming session at the Innovation Convention, December 2011**

#### **Innovating out of the crisis**

**Brainstorming session hosted by the European Research Area Board (ERAB), together with the European Forum for Forward Looking Activities (EFFLA) and the Innovation for Growth group (I4G)**

**EU Innovation Convention, Brussels 6 December 2011, 9h-11h30**

This brainstorming session will be hosted by ERAB, together with the European Forum on Forward Looking Activities (EFFLA) and the Innovation for Growth expert group (I4G). Other experts have also been invited. A selected group of young researchers and the speakers of the ERAB Stakeholder Conference (Seville 2010) are amongst them.

The session will focus on three topics identified by ERAB as priorities for analysis, in the context of the European Research Area and the Innovation Union initiative.

There are great hopes in the role of research and innovation in overcoming the crisis, and new approaches are needed to make the most out of policies in this field. Participants in this session are asked to bring with them all their experience but also their candour to take part in a brainstorming on the future of European research and innovation policy.

- **Grand challenges: how to define agendas and mobilise national and regional resources**

Identifying a set of grand challenges will allow Member States to agree on common research strategies and to pool resources more effectively. But new questions emerge that will determine the success or failure of the initiative:

- Which will be the governance structure for joint efforts, and how will the research agendas be developed?
- Who will take part in this process?
- To what extent should these agendas be detailed?
- How will different technologies be integrated?

Tackling grand challenges has implications beyond European Research and Innovation (R&I) policy. The Framework Programme (in the future, Horizon 2020) mobilises a small part of national funds, but its structuring power is limited. Research efforts at national and European level need to be coordinated to avoid fragmentation and duplication of investments. The Strategic Energy Technology Plan (SET-Plan) is the biggest attempt to align European and national research agendas, involving Member States in the Steering Group and aligning national research budgets. The Joint Programming initiatives are further attempts to align national research budgets on a set of predefined areas.

- How must European and national funds be aligned for grand challenges?
- How can structural funds (SF) earmarked for R&I be added to the picture?
- How can we maximise the benefits of SF investments in view of the new policy priorities?

▪ **Developing the international dimension of the Innovation Union**

Global inter-dependence requires global actions. Research is indispensable to tackle current grand challenges, but it can only succeed if it is supported by coherent policies and political commitment. For research to contribute to the development and cohesion of our societies and to adaptation to economic and demographic changes, the EU depends on building a strong European Research Area but also on developing strategic activities and synergies with other regions of the world.

International scientific collaboration allows for increased access to 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. Research domains from technology and engineering to social sciences and humanities are instrumental to address current and future challenges. Delivery of findings, discoveries and innovations can build trust among people, societies and countries and contribute to global peace and prosperity.

Many results of European Union investments, such as trained researchers or patented inventions, are exploited outside 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 benefits of a strong, pan-European approach. It is time for the EU to design a coherent strategy for international collaborations with ambitious targets, ensuring that Europe remains a key player in the international arena.

- Which is the best way to realise global collaboration on specific grand challenges?
- Are national funding organisations ready to fund international efforts?
- Are European scientists willing to embark on global collaborations?
- Are the actors of the public and private sectors ready to engage in open innovation globally?
- And beyond Europe, are policy makers, funders and researchers aware that Europe is concentrating on grand challenges?
- Are the required competences, e.g. technological ones, available over the globe?
- Does the required and accessible research infrastructure exist?
- Why do barriers for researchers' mobility prevail?
- Do we share global principles for research integrity and ethics, and for assessment of excellence and relevance?

▪ **Maximising the contribution of the social sciences and the humanities to innovation**

Social sciences are a tool to improved understanding of innovation processes, helping to make policy decisions and minimising the social negative effects of technological change. They are also a key component of the development of new products and the evolution of new markets.

Is not the study of human behaviour more important than ever in economies that compete globally?

We have all recently read Steve Jobs' Stanford Commencement speech and how a calligraphy course that he took randomly contributed later on to the design of Apple products. The arts and humanities have a strong affiliation with the creative industries: they create languages to communicate technical complexity in an efficient way, and contribute to changing social perceptions that in turn create the appropriate environment for innovative markets and innovative policies. The case of agricultural biotechnology in Europe illustrates to what extent technical feasibility and cultural acceptance are required for innovation to happen.

Science can assess whether a path takes us to a goal. But it does not define these goals. Social sciences and the humanities create the spaces for public debate on what we want to achieve as a community of human beings and which tools we want to use to get there. Is the current debate on innovation taking this into account?

- How should social sciences and the humanities be embedded in the grand challenges debate?
- What will be the role of social sciences and the humanities in the innovation union?
- How can we provide policy makers with clear examples of the contributions of social sciences and the humanities and with proposals on their structural function in the research and innovation policy process?
- What impact may all these developments have on the design of European R&I systems and how can we adapt to them within the next 10 years?
- What kind of social innovations will be needed in education and research in order to cope with a dilemma between quantity and quality of information? How can we ensure quality and promote excellence in this evolving context?
- How does social innovation relate to societal innovation?
- Is the realm of social innovation a damage-free area? What could be the negative effects of social innovation?
- What could be the role of social innovation in reforming/opening the next European R&I framework?

## About the European Research Area Board

The 22 members of ERAB were announced in April 2008, to advise the European Commission on research and science policy with a view to creating the European Research Area. The ERAB's term ends on 29th February 2012. In 2011-2012 its members are:

**Dr. Reinhold ACHATZ**, Corporate Vice-president, Siemens AG, Corporate Technology, Corporate Research and Technologies (DE)

**Dr. Robert AYMAR**, Former Director General of the European Organization for Nuclear Research (CERN) (CH); Scientific Counsellor to the Administrator of CEA (FR)

**Dr. Lajos BALINT**, Director of International Relations, National Information Infrastructure Development Institute (HU)

**Dr. Jean J BOTTI**, Chief Technical Officer, EADS (DE)

**Dr. Adelheid EHMKE**, Former President, European Platform of Women Scientists EPWS (BE)

**Ms. Anne GLOVER**, Chief Executive Officer, Amadeus Capital Partners (UK)

**Dr. Barbara HAERING**, Chief Executive Officer, ECONCEPT Inc. (CH)

**Prof. Sir David KING**, Founding Director, Smith School of Enterprise and the Environment – University of Oxford (UK)

**Dr. Leif KJAERGAARD**, President of LEIF and FOOD SCIENCE, former Chief Technology Officer of Danisco A/S, (DK)

**Prof. Marja MAKAROW**, University of Helsinki (FI) and Chief Executive, European Science Foundation (FR)

**Prof. Zaneta OZOLINA**, Faculty of Social Sciences, University of Latvia (LV)

**Prof. Maria Cristina PEDICCHIO**, Faculty of Sciences, Università di Trieste and President,

Cluster in Biomedicine (CBM) (IT)

**Prof. Alain POMPIDOU**, Honorary President, Former Senior Adviser to the Director General of the Centre National de la Recherche Scientifique (CNRS) for European Affairs (FR)

**Prof. Carlos Maria ROMEO-CASABONA**, Director, Inter-University Chair in Law and the Human Genome, University of Deusto and University of the Basque Country (ES)

**Prof. Luc SOETE** : Director of UNU-MERIT (the United Nations University- Maastricht Economic and Social Research and Training Centre on Innovation and Technology) (NL)

**Dr. Unni STEINSMO**, President, Chief Executive Officer, SINTEF (NO)

**Prof. Lena Treschow TORELL**, President, Royal Swedish Academy of Engineering Sciences (SE)

**Dr. Jan VAN DEN BIESEN**, Vice-president Public R&D Programs, Philips Research (NL)

**Prof. Georg WINCKLER**, Rector, University of Vienna, former President, European University Association (AT)

**Prof. John WOOD**, Secretary General, The Association of Commonwealth Universities (UK)

**Dr. Ingrid WÜNNING TSCHOL**, Head of Science and Research, Robert Bosch Stiftung (DE)

**Prof. Nüket YETIS**, President, The Scientific and Technological Research Council of Turkey (TR)



The European Research Area Board is chaired by Prof. John Wood. The Vice Chairs are Prof. Marja Makarow and Dr. Ingrid Wüning Tschol. Together with Dr. Robert Aymar, Prof Lena Treschow Torell and Dr. Jan van den Biesen they form the ERAB Bureau.

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The European Research Area Board (ERAB) was established in 2008 to provide independent and authoritative advice to the European Commission on research and science policy with a view to creating the European Research Area.

Its 22 eminent members are drawn from the fields of science, academia and business.

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