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**Response to the  
Consultation on the ERA Framework:  
Areas of untapped potential for the development of the European Research Area  
November 2011**

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**CESAER** - the Conference of European Schools for Advanced Engineering Education and Research - is a non-profit-making international association of leading European universities of technology and engineering schools/faculties at comprehensive universities and university colleges.

**CESAER** stands for scientific excellence in engineering education and research, and the promotion of innovation through close cooperation with the private and the public sector in order to ensure the application of cutting-edge knowledge in industry and society. It maintains and promotes the highest quality standards in knowledge and competence with added value to collaborators of competitiveness and growth environments.

**CESAER** has a current membership of 57 institutions from 25 different countries.

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## 1. Introduction

- CESAER is fully committed to the idea and the establishment of the European Research Area (ERA) and is prepared to work with the European Commission along the way of the further development and completion of ERA. Strengthening ERA – including the innovation dimension – is an important contribution to strengthening the European knowledge economy and society as a whole.
- Based on the provisions of the TFEU the European Commission has an important role in the process of developing and completing ERA. However, CESAER emphasized that ERA is a process that will need continuous attention, updating and further development.
- CESAER continuously encourages and supports its member institutions to consider the ERA dimension in their institutional strategies and programmes in education, research and innovation.
- CESAER emphasises the need to consider the knowledge triangle - the integration of education, research and innovation - as a core concept when further developing and completing the ERA Framework.
- CESAER is committed to the modernisation agenda of universities<sup>1,2</sup> and has organised the CESAER SMART Initiative in that context with a focus on research strategies and management, financial sustainability of university research and making the knowledge triangle a reality<sup>3</sup>.

## 2. Researchers

- Human resources for research are in the core of developing ERA and meeting the ambitious Europe 2020 objectives. In many Member States, industry complains that there is a particular lack of engineers and scientists. There is a need for a joint effort of the Commission, the Member States and higher education institutions in the area of engineering to raise the interests of young people for science and technology and to attract more students to universities of technology or to science also in other universities.
- In general, the European research system and also individual Member States do not attract and retain sufficient numbers of leading researchers from other parts of the world. However, CESAER member institutions have developed strategies for attracting excellent researchers and CESAER is prepared to identify amongst its members institutional cases of best practice.
- CESAER has repeatedly informed its members about the Charter of Researchers and the Code of Conduct for their recruitment. At the moment, 13 CESAER members have signed up. CESAER sees the need for more effort to raise awareness for these initiatives, to encourage member institutions to sign up and to implement the necessary measures in the appropriate way in accordance with national legal framework and the institutional strategy and practice. CESAER plans to organise a workshop on the experiences and

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<sup>1</sup> European Commission: *Delivering on the Modernisation Agenda for Universities: Education, Research and Innovation*. COM(2006) 208 final, Brussels, 10.05.2006

<sup>2</sup> European Commission: *Supporting growth and jobs – an agenda for the modernisation of Europe's higher education systems*. COM(2011) 567 final, Brussels, 20.09.2011

<sup>3,3</sup> CESAER: *The CESAER SMART Initiative. Stimulating the Modernisation Agenda for Research and Technology*. Report. Leuven, 27 June 2011; see: <http://www.cesaer.org/en/projects/>

plans of CESAER members and would welcome the support and cooperation of the Commission in such a promotion initiative.

- For CESAER members, doctoral studies are of key importance and the development of advanced approaches in that area plays a core role in their institutional strategies. Different models are applied in different Member States by CESAER members<sup>4</sup>. CESAER welcomes the initiatives of the Commission regarding innovative doctoral programmes and is prepared to contribute to these developments. CESAER emphasizes that the essence of a doctorate is the development of the ability to conduct original research and to extend the boundaries of knowledge. Research excellence must remain the key quality criterion.
- There is a need for better information on the Human Resource Strategy for Researchers and CESAER would welcome the cooperation with the Commission in an effort to raise awareness on this strategy amongst its members.
- CESAER is aware of the need for a substantial increase of the number of researchers in the EU as a complementary measure to achieving the Europe 2020 goal of 3% of GDP investment in research in the EU. The EU RTD Framework Programmes supports that strategy in the Cooperation and also in the IDEAS and PEOPLE Specific Programmes. However, collaborative research projects and Marie Curie fellowships are providing only temporary jobs. ERC grants under the IDEAS Specific Programme offer a five years perspective for awardees of Starting Grants but don't offer more long-term perspectives.
- Mobility programmes and also attractive schemes providing funding for several years cannot substitute necessary European, national and institutional measures to create more jobs for researchers and to open attractive longer term perspectives for researchers at universities. CESAER is interested to work with the Commission in developing realistic and feasible human resource strategies and offers to collect information about different approaches of CESAER members in the area of human resource development for research. In the course of the CESAER SMART Initiative<sup>5</sup> some information has been collected already.
- There are interesting examples applied by CESAER members to retain excellent young researchers at universities by offering them attractive career perspectives such as Assistant Professorships with Tenure Track at EPFL<sup>6</sup>. It would be helpful if such schemes were introduced more widely in top European Universities and on comparable basis, because it would contribute to the creation of a European job market for academic researchers and it would increase the prospects of young academics. Hiring and retaining good young researchers is a most appropriate way to increase the dynamics of an institution.

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<sup>4</sup> See e.g. the Doctoral Programmes of the Austrian Science Fund [http://www.fwf.ac.at/en/projects/doctoral\\_programs.html](http://www.fwf.ac.at/en/projects/doctoral_programs.html) or the Graduate Colleges of the DFG, the German Research [http://www.fwf.ac.at/en/projects/doctoral\\_programs.html](http://www.fwf.ac.at/en/projects/doctoral_programs.html), or the Graduate Training Groups of the German Research Foundation (DFG). [http://www.dfg.de/en/research\\_funding/programmes/coordinated\\_programmes/research\\_training\\_groups/index.html](http://www.dfg.de/en/research_funding/programmes/coordinated_programmes/research_training_groups/index.html) Their key emphasis is on the qualification of doctoral researchers within the framework of a focused research programme and a structured training strategy. [http://www.dfg.de/en/research\\_funding/programmes/excellence\\_initiative/graduate\\_schools/index.html](http://www.dfg.de/en/research_funding/programmes/excellence_initiative/graduate_schools/index.html)

<sup>5</sup> See footnote 1

<sup>6</sup> École Polytechnique de Lausanne <http://www.epfl.ch/>; see e.g. <http://scijobs.sciencemag.org/JobSeekerX/ViewJobRSS.asp?cjid=45180&AccountNo=103>

- Professorial careers must start at a sufficiently young age so that after an assistant professorship the candidate can find another, often final, job. Accompanying measures should be implemented, for example, the necessity of leaving one's home institution after obtaining a doctorate or limiting the number of years that a postdoc may stay in a job, in order to mix up the pool of prospective researchers and give them more international exposure. A common agreement on the functioning of the European academic market is necessary for this to work.
- The obstacles for researcher mobility in the EU are well known and CESAER welcomes and supports all measures that are taken by the Commission and at Member States' level to remove the remaining barriers. Social security and portable grants are major issues and need to be tackled by Member States together with the Commission. CESAER strongly supports the initiative by the European Commission towards setting up Pan-European Pension Funds for Researchers and towards appropriate provisions for international researchers in Europe, to make transferable pensions possible. CESAER is interested to participate in and work with the Commission in any initiatives regarding the different researcher mobility issues.
- Utilizing the potential of more female researchers at universities is a main issue also for CESAER member institutions. There are numerous national and regional programmes in Member States and also specific initiatives of individual institutions. CESAER recommends to prepare an overview of such initiatives and programmes and to organise a European platform for exchange of information and experience and also for launching new joint initiatives where appropriate.

### **3. Cross-border operation of research actors**

- CESAER supports the efforts towards a stronger coordination and alignment between EU and national S&T policies and programmes. There is a need for more coherence and balance between the EU and national policy levels in order to strengthen the position of European S&T in the world. That means that there should be an appropriate and well conceived coordination, cooperation and division of labour between
  - regional and national research activities,
  - research activities in different arrangements ('variable geometry') between groups of Member States, and
  - the EU Framework Programme.
- In recent years, universities have gained more autonomy while, at the same time, institutional funding has been reduced and more emphasis is put on competitive funding. This aspect has been analysed in the course of the CESAER SMART Initiative.<sup>7</sup> In most cases, competitive funding requires co-funding. "The challenge of financial sustainability for universities is the combination of budget cuts of the core governmental funding and the present structural research underfunding by other sources due to co-financing obligations and inappropriate coverage of overheads. For the universities, this may lead directly from the funding gap to a funding trap."<sup>8</sup> Therefore, CESAER emphasises the

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<sup>7</sup> See footnote 1: pp. 19-24

<sup>8</sup> See footnote 1, p. 20

need to ensure adequate funding in European programmes for research and innovation in order to avoid such a “funding trap”.

- CESAER welcomes the ideas of the Commission to include the support of public procurement and pre-commercial procurement in the new funding schemes in HORIZON 2020. This is seen as a proper means to stimulate innovation in the EU.
- The national and regional research funding agencies and councils form one of the most important frameworks for research in the EU. CESAER sees the need to enforce more and better coordination and cooperation between the national research councils in Europe. Experiences with ERA Instruments such as ERA-NETs etc. show that the fragmentation of the research funding system is still an issue despite some interesting initiatives e.g. the EUROHORCs Lead Agency and Grant Union initiatives and examples like D-A-CH. The differences in rules and procedures of owners and managers of national programmes make the implementation and management of ERA instruments complex and cumbersome. Therefore, CESAER is convinced that improving the harmonisation and interoperability of national funding agencies would substantially improve the efficiency and effectiveness of research funding in the EU. This should be one of the major tasks of the newly founded Science Europe organisation<sup>9-10</sup>.
- National research funding agencies should improve the opportunities for cross-border research cooperation and provide sufficient opportunities for funding.
- CESAER as the association of research oriented higher education institutions in the field of engineering requests an appropriate consideration of universities’ involvement and participation in the development of major European initiatives in the area of education, research and innovation. Universities of Technology, engineering schools/faculties at comprehensive universities and university colleges are important actors in the research and innovation effort in Europe. CESAER member institutions rank highly in the lists of FP7 grant agreements<sup>11</sup>. The SET-Plan and the establishment of the European Platform of Universities Engaged in Energy Research (EPUE) are an example of good practice that should be followed also in other initiatives from the start. Also in Joint Technology Initiatives, universities can make important contributions when the regulatory framework is appropriate especially with regard to IP protection.
- Based on the ERA-NET experience, CESAER welcomes initiatives for Joint Programming and CESAER member institutions are prepared to provide input for the development and design of such initiatives.
- CESAER members are joining forces in different arrangements forming strategic alliances in the areas of education, research and innovation. CESAER would certainly welcome a HORIZON 2020 scheme supporting joint education, research and innovation initiatives.

#### **4. Research infrastructures**

- The pan-European research infrastructures (RIs) are key elements of ERA. For CESAER’s members as research oriented universities RIs present important resources

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<sup>9</sup> Science Europe: <http://www.scienceurope.org/>

<sup>10</sup> M. Geoghegan-Quinn: *Launch of Science Europe*. Speech of the Commissioner for Research, Innovation and Science. Berlin, 21 October 2011, p. 6

<sup>11</sup> European Commission: *FP7 Monitoring Report 2010*. Brussels, 4 august 2011, pp. 16-17

complementary to the universities' unique research facilities and equipment. CESAER underlines the importance of the RIs as necessary for maintaining leading positions in frontier research. RIs are also points of attraction for excellent researchers and should be considered as meeting places for researchers from different disciplines and also as platforms for collaboration between academia and industry and other societal actors.

- The partnership between universities and RIs should be strengthened. In the course of strategy development and priority setting, universities should also identify the major RIs relevant for their long-term development.
- CESAER would welcome a map presenting the pan-European RIs together with unique research facilities in universities.
- CESAER highly welcomes the work of ESFRI and strongly supports the Innovation Union's commitment to complete or launch 60% of the RIs by 2015. Pan-European RIs contribute substantially to the scientific and technological competitiveness of the EU.
- Cooperation, interoperability and optimized synergies between HORIZON 2020 and the Cohesion Policy Funds are of key importance for the development of RIs in ERA. Regarding funding, planning and feasibility studies should be financed via the Framework Programme while construction should be financed from Structural Funds and as well as from national sources. Maintenance, updating and operations should be funded from national funds and from the Framework Programme. Member States and the Commission should agree on a long-term plan for the development, maintenance and regular updating and upgrading of RIs. In particular well defined cases, international partners should be attracted. Also public procurement and pre-commercial procurement should be considered when developing pan-European RIs.
- Also for RIs in ERA cohesion policy plays an essential role. Therefore, the regional innovation strategies RIs and Regional Partner Facilities should be an integrated part of smart specialisation.
- With the increase and rapid development of e-science CESAER sees the need to have a special focus on e-Infrastructures<sup>12</sup>.

## **5. Knowledge circulation: knowledge transfer and open access**

- CESAER members have long-term experience and track record of making the third mission of universities a reality. However, they see also a need for further developing this area of university activities and moving beyond the simplistic transfer concepts that still prevail. There is a need to develop towards more complex interactions between universities and industry and other external partners. Within a new approach, the three concepts of knowledge triangle, Triple Helix and Open Innovation have to be integrated with an emphasis on close cooperation and co-development between the main actors in the innovation system.
- HORIZON 2020 puts a priority on research and innovation. It will be very important to ensure that advanced methods and processes for partnerships between universities and

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<sup>12</sup> High Level Expert Group on Scientific data: *Riding the wave. How Europe can gain from the rising tide of scientific data*. A submission to the European Commission. Brussels, October 2010

industries are applied and further developed that bear the potential to lead to innovation. CESAER sees also a need for research on innovation.

- The innovation dimension should be adequately well presented in all aspects of the ERA Framework developing the European Research Area towards the European Research and Innovation Area.
- The CESAER SMART Initiative has produced interesting results in this area and CESAER is prepared to work with the Commission in the further development of the necessary concepts to underpin enforced innovation activities in HORIZON 2020<sup>13</sup>.
- Needless to say, CESAER sees an urgent need to finalise the efforts towards a European Patent.
- CESAER appreciates the Responsible Partnering<sup>14</sup> guidelines but admits that more has to be done for disseminating this information and promoting the usage and implementation by CESAER members.
- CESAER supports the initiatives of the Commission to provide open access to publications while CESAER members emphasise the importance of ensuring quality and excellence.

## 6. International cooperation

- Addressing grand societal challenges calls for enhanced cooperation between Member States e.g. in the Joint Programming Initiatives and in ERA-NETs. This will require a new emphasis on international cooperation. Therefore, CESAER supports a strengthened international dimension in HORIZON 2020 based on a strategy recognising appropriate coordination, cooperation and division of labour between the national and EU level – encompassing bi-lateral, multilateral arrangements between several Member States and third countries, and the EU Framework Programme.
- CESAER supports the activities of SFIC as the right forum of Member States and the Commission working together identifying priority areas of common interest and benefit.
- Experience shows that ERA is not visible in the international domain where the S&T from Europe is appearing in a fragmented way and there is not enough information, coordination and cooperation between Member States. In that context, it is interesting to note that international cooperation partners such as China would prefer cooperation at EU level but at the same time sees the complexity and time dimension on working with Europe. CESAER sees it as major task of SFIC to reduce this complexity.
- CESAER members are very active in international cooperation. The Commission is encouraged to utilize and exploit the insight and experience as well as connections and linkages of universities when developing international strategies and initiatives.
- Closer cooperation between the DGs of the research family and the external services would be useful.
- Increasingly, universities form strategic alliances when starting institutional activities in third countries. So far, most of these initiatives are rooted in the national level<sup>15</sup>.

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<sup>13</sup> See footnote 1, pp. 25-31

<sup>14</sup> *Joining Forces in a world of Open Innovation. GUIDELINES for Collaborative Research and knowledge transfer between science and industry.* EIRMA, EUA, EARTO, ProTon, October 2009

However, for the future it would be worthwhile to foresee a scheme supporting transnational university alliances for international cooperation in HORIZON 2020.

## **7. Managing and monitoring the ERA partnership, cross cutting issues and next steps**

- CESAER sees a well designed ERA Framework as a major step forward towards a really unified ERA as an integrated market for knowledge, research and innovation providing optimal conditions for research and innovation in Europe.
- The general policy framework for all activities will be the Europe 2020 strategy and the Innovation Union and also the other flagship initiatives. CESAER sees a need to ensure that these important new policies, strategies and initiatives are apprehended, recognised and implemented at all levels. It will depend on the ownership by institutions like CESAER members that the highly ambitious objectives of EU research and innovation policies and strategies will be achieved by 2020. However, this will require targeted initiatives to get the main actors of the EU research and innovation system “on board”. CESAER is committed to this effort and will organise a campaign to market the new policies in connection with activities to promote HORIZON 2020.
- As a consequence, CESAER sees a need to better “market” ERA and also provide feedback on the state of its development. The Framework Programme as the main EU financial instrument for implementing EU research and innovation policies is the largest competitive programme world wide. However, there is very little public awareness on the programme and even amongst scientists and engineers there is not enough information about major achievements of the programme. Therefore, CESAER recommends launching a major marketing initiative about EU research and innovation organised in a professional way and addressing both the general public and the research and innovation community in Europe and beyond.
- CESAER would welcome a stronger involvement in participatory ERA policy processes. Interaction and regular information about the work of the ERA initiatives and the related High Level Groups (HLGs). Communication may be organised by the Commission or the different HLGs. The HLGs that are closely related to universities and researchers as well as university activities are particularly interesting for CESAER. A higher involvement of stakeholder organisations such as CESAER would strongly contribute to bringing the ambitious high level objectives “down to earth” and ensuring that there is a close link between the policy level and the “real world”. Involvement and participation will develop the necessary ownership of ERA initiatives by stakeholders. The development and completion of ERA is very much a communication challenge. When involvement, participation and commitment of stakeholders will not function the whole ERA concept and strategy will fail.
- ERA is just one region in the world and the global landscape of research and innovation is in dynamic development and change. There is a need for carefully monitoring of the

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<sup>15</sup> E.g. the PoliTong the Sino-Italian Campus at Tongji University, Shanghai, China, that is a joint initiative of Politecnico di Milano, Politecnico di Torino and Tongji University;

<http://www.tongji.edu.cn/english/themes/10/template/Academics/SINO-ITALIAN%20CAMPUS.shtml>

Another example are the “Sino-Swedish Centres” at two of the major universities in China, Peking University in Beijing and Fudan University in Shanghai jointly established by KTH, Chalmers University of Technology, and Karolinska Institute (KI).



global developments to continuously assess the position of EU research and innovation in a global context. CESAER welcomes the Innovation Union Competitiveness Report<sup>16</sup> as a highly valuable source of information. In addition, also foresight activities are most important. Therefore, CESAER welcomes the Innovation Union commitment to establish a European Forum on Forward Looking Activities<sup>17</sup>. The results of the monitoring and the forward looking activities provide an important input in the institutional management of CESAER member instructions. Therefore, easy access and appropriate measures for disseminating information to users will be very important.

CESAER

Leuven, November 2011

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<sup>16</sup> European Commission: Innovation Union Competitiveness Report. 2011. Directorate-General for Research and Innovation. EUR 24211. Luxembourg, Publications Office of the European Union, 2011

<sup>17</sup> European Commission: Europe 2020 Flagship Initiative: Innovation Union. COM(2010) 546 final, Brussels, 6.10.2010, p. 12