Working Together to Strengthen Research in Europe
European Research Area Conference 21-23 October 2009, Brussels

Summary of discussion and conclusions of individual session 1.2:

What are the next steps in developing world-class research infrastructures (RIs) in Europe?

The issue and context:

Pan-European RIs are dedicated to the support of research excellence via service in frontier research. Their European added value consists in attracting and supporting the best researchers and technicians in the world, selected by merit-based, peer review competition in all science fields, from Humanities to Physics. This international service, in turn, generates cutting-edge technology, education and management in unique and innovative ways, drives innovation and brings economic benefits in the hosting Regions and in Europe. RIs are, therefore, the backbone in the construction of the ERA, and their existence pre dates the European Union. Their first development and contribution was to the Renaissance (the medieval libraries/abbeys which preserved and promoted the technologies and knowledge of the Arab, Greek and Roman civilizations) and then to the recovery after WW2 (*e.g.* CERN, ESA, EMBL, ESO, bringing back Europe to world competition after the damage of the war). These, and subsequent efforts, show that when Europe has been able to integrate its resources and to speak with one voice at international level, it proves itself a global force in the related fields of research.

The present endowment of RIs in Europe is large and unique in the world, numbering more than 300 effective or potential pan-EU RIs mostly nationally owned, for a total investment of over €100 billion. If this investment is brought into international competition, and used to attract the best researchers in the world, it could help to strengthen the ERA, and offset partly the decreasing share of Europe in world resources, due to the growth of the emerging economies.

The evolution towards a more integrated system of pan-EU RIs is already well underway, thanks to the efforts of the EC (catalytic funding of access, at about €0.25 billion per year on an overall annual expenditure of €10-15 billion by national resources) and of ESFRI (building trust and developing a 'Joint Roadmap Programming' by the EU Countries). However, this process is still too slow, and now is at risk due to the small scale of investment and to the lack of effective governance arrangements, with new or upgraded RI requiring long term commitments to fulfill their pan-EU role. This conflicts with the increasing rigidity of national budgets and the effects of the current financial crisis (e.g. this may induce a growing protectionism).

The question to be addressed in this session is: 'how can we identify and avoid the main bottlenecks in developing this integrated system, establishing priorities for the next steps?'

Analysis of the challenges and European dimension:

The problems/bottlenecks impeding a more rapid evolution of a pan-EU system of RIs can be listed in the following order of impact:

1) Funding and quality issues: the need to find ways to combine EU and National funding more effectively; this needs a stronger EU financial support for 'quality driven actions' and supporting peer reviewed access and related quality developments.

2) Evaluating and prioritizing the use of resources: we need to continue with the coordinated development of national roadmaps helping, in a more structured way, in the evaluation and prioritization of needs and resources.

3) The attraction, education and mobility of human resources (research, technical and managerial): these issues relate to the need to attract researchers and technicians/engineers at world level, to educate and train new researchers and technicians/engineers, as well as to ensure the development of the necessary managerial capabilities, and the EU circulation (under the appropriate status) of all the critical aforementioned human resources.

4) Governance structures: the need to build on the positive experience of the EIROFORUM members and of the ERC, keeping in mind that governance must include the capability to give scientific motivation and

challenges and that different aspects must be focused at the various appropriate levels (*e.g.* ERA-level and RI-level).

Conclusions/Recommendations:

A general discussion of these issues followed presentations from the chair of the ERA Expert Group on World Class Research Infrastructures and from four invited experts. This gave rise to the summarised points listed below:

1. There was general agreement about the crucial role that RIs play in developing and maintaining the ERA – and support for a deeply connected and extensive implementation and use of e-infrastructure and data-access, as being also central to this vision.

2. Funding in general and in particular funding of the open access operation could become increasingly difficult, as countries cut national budgets following the boost in public spending to aid recovery through 2009 and 2011. This makes it imperative that the strongest possible case should be made to stress the pivotal role played by RIs in maintaining/improving the overall quality of the EU research system, to ensure future economic and social development and wellbeing.

3. Open peer reviewed access to RIs is seen as a way of promoting competition and enhancing the international reputation of the ERA as a research friendly environment. But such access brings with it additional costs which must be covered, because overall sustainability cannot be ensured solely by the cost improvements achieved by pooling existing resources. Further consideration should be given to mechanisms that would assist this objective.

4. The issue of evaluation and prioritisation across all scientific domains and between existing and new RIs is an important one and the Expert Group and ESFRI should give further consideration to it.

5. RIs rely heavily on a wide variety of human resources – not just the trained researchers capable of utilising the services of the RI, but also to provide overall direction, management and technical support for the service. Fostering these human resources is key to efficient operation and the long term vitality of RIs. Steps should be taken to ensure continuity of accrued employment benefits for potentially mobile researchers and to promote management skills.

6. The close relationship between universities and RIs contributes to an effective educational and scientific eco-system, which can be attractive and supportive for industry. A significant increase in research funding across the EU, would require a concomitant increase in the output of trained researchers from the higher education sector, and RIs can contribute to this effort, helping the multidisciplinary training needed by the industry and to tackle the grand challenges.

7. In terms of international relations, there was a perceived need for a single point of contact representing pan-EU RIs. This would be more than a 'voice for European RIs'. It would provide a vital link between non-EU funding agencies, non-EU RIs and their European counterparts.

8. New models (financial, including new EC Financial Perspectives and Financial Regulation; legal; etc.), taking into account the non-economic character of Research, for funding RIs should be promoted (in particular the investments in their construction/upgrade), in order to stimulate regional development and facilitate better access to available funds (e.g. EC, SF, EIB, etc.).