Developing Research Infrastructures for 2020 and beyond

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"The views expressed in this presentation are those of the author and do not necessarily reflect the views of the European Commission"
Research Infrastructures

Research infrastructures are facilities, resources and services that are used by the research communities to conduct research and foster innovation.

Major scientific equipments

Knowledge-based resources

e-infrastructures
Why an EU approach for Research Infrastructures?

- To address collectively the complexity and cost of the design and development of new world class research infrastructures
- To open access to the research infrastructures existing in the individual Member State to all European researchers
- To avoid duplication of efforts and to coordinate and rationalise the use of these research infrastructures
- To trigger the exchange of best practice, develop interoperability of facilities and resources, develop the training of the next generation of researchers
- To connect national research communities and increase the overall quality of the research and innovation
- To help pooling resources so that the Union can also develop and operate research infrastructures globally
ESFRI – European Strategy Forum on Research Infrastructures

- Set up by the EU Council of Research Ministers in 2002
- Brings together representatives of Ministers of the 27 Member States, 10 Associated States, and of the European Commission
- To support the development of a European policy for Research Infrastructure and discuss a long term vision at European level
- To facilitate multilateral initiatives leading to the better use and development of Research Infrastructures, at EU and international level
ESFRI – The Roadmap mandate

- Mandated by the EU Council of Research Ministers of November 2004 to develop a strategic roadmap in the field of Research Infrastructures for Europe

- The ESFRI roadmap identifies new pan-European Research Infrastructures or major up-grades to existing ones, corresponding to the needs of European research communities in the next 10 to 20 years, in all fields of Sciences and Technologies, regardless of possible location

- First Roadmap published in 2006, followed by two updates in 2008 and 2010:
  - Now contains 48 projects
  - Requiring major financial investment (~20 b€) and long term commitment for operation (~2 b€/year)
ESFRI roadmap 2010

26+22 new - or major upgrade of - Research Infrastructures of pan-European interest
(+ 3 additional projects from the CERN Council strategic roadmap for particle physics *)

### Social Sc. & Hum. (5)
- SHARE
- ESS Survey
- CESSDA
- CLARIN
- DARI AH

### Life Sciences (13)
- BBMRI
- ECRI N
- INSTRUCT
- EU-OPENSCREEN
- Euro Biol maging

### Environmental Sciences (9)
- ELIXIR
- INFRA FRONTIER
- LIFEWATCH
- EMSO
- SIAEOS
- ISBE

### Energy (7)
- EURO-ARGO
- IAGOS
- Windscanner
- EPOS
- EISCAT_3D
- COPAL

### Material and Analytical Facilities (6)
- ECCSEL
- EUROFEL
- EMFL
- EU-SOLARIS
- JHR
- IFMIF

### Physics and Astronomy (10)
- ELSI
- TIARA*
- KM3NeT
- E-ELT
- SKA
- SPIRAL2
- FAIR
- ILC-HI GRADE*
- ILC-20/20 Upgrade
- HiPER

### e-Infrastructures (1)
- ERIC
- SHARE BBMRI ELIXIR ICOS EURO-ARGO ECCSEL EUROFEL ELI TIARA* PRACE
Commitments

• **Innovation Union flagship initiative**: implementation of the ESFRI roadmap, facilitate trans-national access, develop international cooperation

• **European Research Area**: financial commitment for the construction of EFSRI projects, consolidate access to and integration of RI, complementarity between funding sources
From FP7 to Horizon 2020

What has changed?

• More focused support to the implementation and also operation of world-class infrastructures such as ESFRI infrastructures
• Broader access to and deeper integration of European research infrastructures
• Foster the innovation potential of research infrastructures
• Widen the participation to pan-European research infrastructures
• More support to e-infrastructures
• Reinforce policy support to European strategy on research infrastructures
• Support a challenge driven approach of the actions
• Develop international dimension of the actions

Excellent science
- European Research Council
- Future and Emerging Technologies
- Marie Curie actions
- European Research infrastructures (including e-infrastructures)

Societal challenges
- Health, demographic change, wellbeing
- Food security, sustainable agriculture, marine - maritime research, bio-economy
- Secure, clean and efficient energy
- Smart, green, integrated transport
- Climate action, resource efficiency, raw materials
- Inclusive, innovative and secure societies

Industrial leadership
- Leadership in enabling and industrial technologies (ICT, space, nanotechnologies, advanced materials and advanced manufacturing and processing, biotechnology)
- Access to risk finance
- Innovation in SMEs
Research Infrastructures in Horizon 2020

1. Developing the European RIs for 2020 and beyond
   • Developing new world-class RIs
   • Integrating and opening national and regional RIs of pan-European interest
   • Development, deployment and operation of ICT based e-Infrastructures

2. Fostering the innovation potential of RIs and their human resources

3. Reinforcing European RI policy and international cooperation
A Coherent Toolbox of Activities

- Concept
- Preparation
- Implementation
- Operation

EU (Structural) Funds & National Funding

ESFRI & Other World Class RI (OWCRI) of pan European interest

- Preparatory Phase
- Support to Implementation & Operation

Integrating Activities
Innovation & Human resources

Policy support actions – International Cooperation
Developing New world-class RIs

*Concept & Preparatory Phases*

Help Europe respond to challenges in science, industry & society:

- Support the **conceptual design** of new research infrastructures, which are of a clear European dimension and interest:
- Support the **preparatory or pre-implementation phase** of ESFRI projects
Implementing world-class RI

*Implementation & Operation Phases*

Facilitate and support the implementation, long-term sustainability and efficient operation of the ESFRI & OWCRI:

- Prioritised ESFRI projects and selected OWCRI with established legal structure and governance such as ERIC

- Clusters: joint activities and implementation of common solutions for RI in specific domains
Integrating and Opening National RI of pan-European Interest

*Integrating Activities*

To open up key national and regional research infrastructures to all European researchers and to ensure their optimal use and joint development:

- Networking;
- Transnational Access;
- Joint Research Activities for the improvement of RI services.

And emphasis on management efficiency, innovation capacity (technology transfer, participation of SMEs, instrumentation development), international dimension, management of generated data…

- Simplified implementation (unit cost…)
Development, deployment and operation of e-Infrastructures...

...to make every European researcher digital

- e-Infrastructure for Open Access
- Big data
- Global data e-infrastructures
- Centres of excellence for computing applications
- Virtual research environments
- Provisioning of core e-services for research communities
Exploiting the innovation potential of RI

- R&D partnerships with industry to develop Union capacities and industrial supply in high-tech areas such as scientific instrumentation or ICT;
- Stimulate the use of research infrastructures by industry incl. SMEs;
- Encourage the integration of research infrastructures into local, regional and global innovation systems;
- Pilot Pre-Commercial Procurement (PCP) and Public Procurement of Innovation (PPI) schemes (e.g. in the field of instrumentation).
Exploiting the innovation potential of RI

One action to support:

- the development of an opportunity portal of calls, tenders and future needs and technology transfer opportunities in RI of pan European interest;
- the networking of procurement professionals to encourage exchange of good practices across RI sectors;
- Awareness campaign towards industry on the potential of RIs for their activities in selected R&D areas.

One pilot action in the field of scientific instrumentation exploiting the innovation potential of RI using Pre-Commercial Procurement (PCP) and/or Public Procurement of Innovation (PPI) schemes.
Support the training of staff managing and operating RI of pan-European interest, the exchange of staff and best practices between facilities, and the adequate supply of human resources in key disciplines, including the emergence of specific education curricula.
Support partnerships between relevant policy makers, funding bodies or advisory groups e.g. ESFRI & e-IRG, develop complementarities and ensure coordination between different Union policies and programmes, support NCP network, survey, monitoring and assessment of RI and support the development of an up-to-date database on RI in Europe.
International Cooperation

Facilitate the development of global research infrastructures and the cooperation of European RI with their non-European counterparts, ensuring their global interoperability and reach, and to pursue international agreements on the reciprocal use, openness or co-financing of infrastructures.

- Support to GSO activity, bilateral partnerships with e.g. Africa, ENP, Russia and multilateral partnerships e.g. transatlantic in Arctic, Marine science and biodiversity
Thank you for your Attention!

Find out more:
www.ec.europa.eu/research/horizon2020