Looking to the future of the Research Infrastructures

John Womersley
Chair, ERIC Forum
Director General, ESS
Pan-European Research Infrastructures

- Are strategic investments in scientific excellence that provide access to capabilities and datasets that go beyond what any single institution or country can deliver
- An essential pillar of the European Science Area
- Act as knowledge and innovation hubs
- Form part of a coherent research ecosystem capable of addressing the major, interdisciplinary challenges facing Europe
- Serve as major promoters of Open Science and Open data through the European Open Science Cloud

Research Infrastructures are facilities that provide resources and services for research communities to conduct research and foster innovation.
European Spallation Source ERIC

SOME NUMBERS

- 1843 M€: construction cost
- 5 MW: world's most powerful particle accelerator
- 15 experimental stations
- 20 × more sensitive on average than today's best
- 800 experiments per year
- 2023: First Science for users
- 13 ERIC member nations
The engineering company Recab from Denmark supplies part of the turnkey solution of EPICS to ESS.

Resulting from supplying to ESS, the company pushed its technical boundary to develop technology in high-speed data acquisition, which now has made the company one of the few companies in the world that hold the leading technology.
**ESS Data Management and Software Centre (DMSC)**

- **Offices in** Copenhagen Bio Science Park (COBIS) – Denmark inaugurated in 2016
- **DMSC designs, develops and supports the ESS scientific data pipeline**
- **ESS requires that all user data be made open and FAIR**
- **Active partner in collaborative open source software development and EOSC**
Research Infrastructures form EUROPE-WIDE NETWORKS

Map of Europe showing countries which host an ERIC (dark blue) and countries which are a member of an ERIC (turquoise blue)

Research Infrastructures produce HUGE DATA SETS

Example: ESS Data Management and Software Centre (DMSC) in Copenhagen, Denmark will handle and store large amounts of experimental scientific data every year

1 PB
• 11,000 movies
• 2.5 years of non-stop watching

7-11 PB data per year
Research Infrastructures and ERA

Research Infrastructures with in-kind investments or distributed nodes in countries of southern and eastern Europe

• Serve as visible pillars of European excellence in those regions

• Help to counteract movement of talent to north and west
What is an ERIC?

- European Research Infrastructure Consortium (ERIC): Specific legal form that facilitates the establishment and operation of research infrastructures with European interest
- Partnership of EU Member States (and Associate and non-Members States) that have agreed to integrate their resources to respond to global societal challenges in various science fields
- ERICs are the backbone of the European Research Area
New ideas by ERIC Forum members to refresh Transnational Access

1. **Reduce the bureaucratic burden** e.g. by giving RIs an annual budget to manage

2. **More outcome-based funding**, whether it be
   a. linked to missions/challenges, interdisciplinary research or joint action between RIs
   b. diversity – targeted at underrepresented groups, underperforming nations
   c. training

3. **Matching funding** e.g. by requiring national co-funding as a condition of EC funding
How can National Contact Points (NCPs) support ERICs?

- **Build knowledge** in areas that are relevant to ERICs
- **Provide support and consultation services** to ERICs no matter where they are located
Now is the time to invest in RIs

Research Infrastructures have shown their value

- Research hubs to address Covid-19
- Nodes of pan-European collaboration
- Pooling of effort and sharing of data
Now is the time to invest in RIs

- Europe’s economies will require an investment stimulus to drive recovery from Coronavirus
- Wide consensus that investment in infrastructure is a smart way to do this (because you are building for the future)
- Especially now, investment in research and research infrastructure is the best investment
  - Epidemic has shown the need and value of research capacity to address unexpected challenges
  - We need to rebuild our industrial capabilities - globalized supply chains no longer viable – low-carbon, knowledge-based economy requires research and innovation
Open data and EOSC

Transform the way science is done?

Act as pillars of excellence across all of Europe

Strengthen ERA?

HOW CAN RIs:

Deliver solutions to pressing problems for Europe?

Missions and challenges, Covid-19, and economic competitiveness