Research Infrastructures

National launching event for Horizon Europe
Virtual conference, 7th & 8th of December 2020
»Exploring Horizon Europe«

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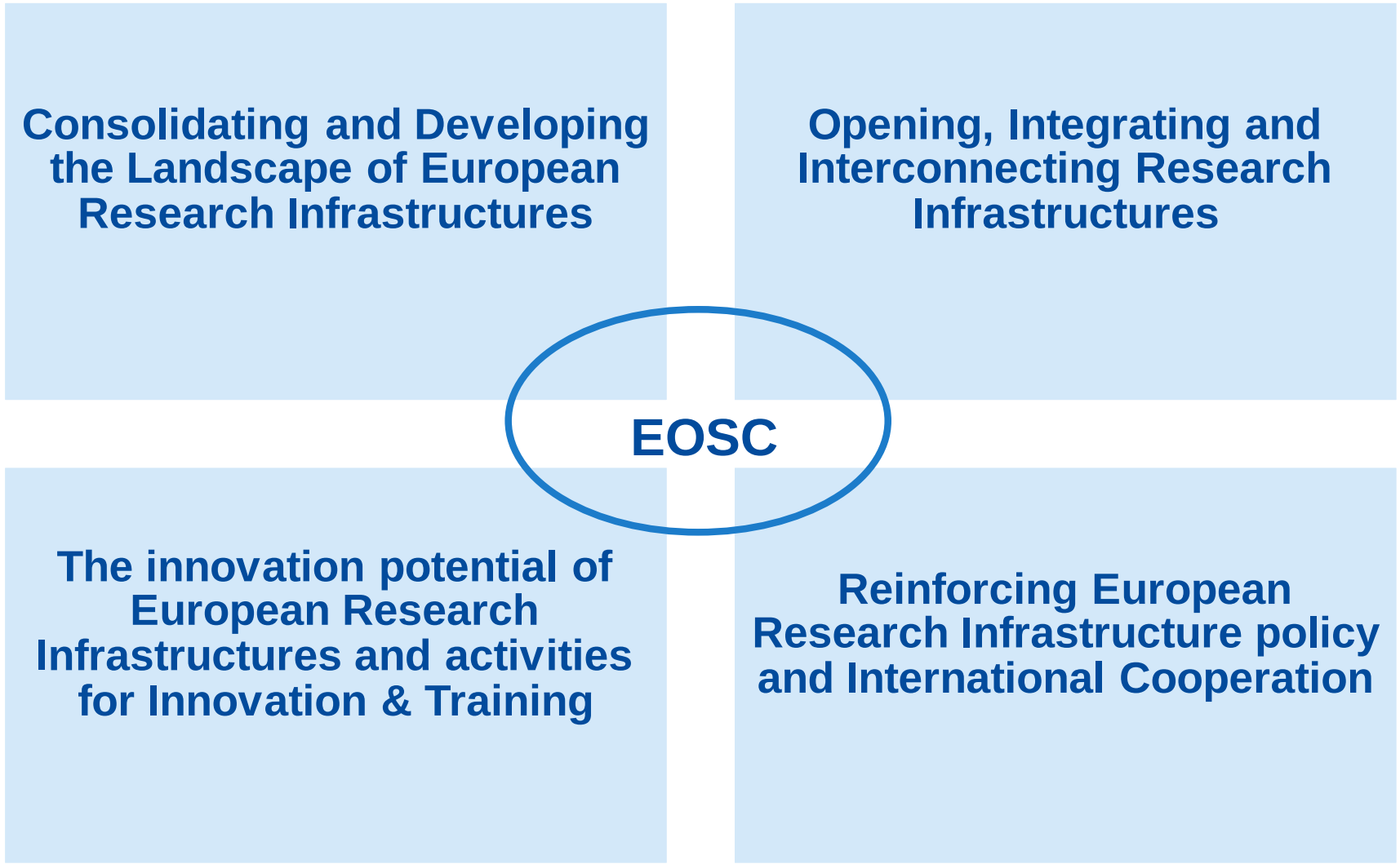
European Commission

Research Infrastructures in the Specific Programme

Intervention Areas



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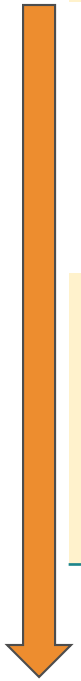
Horizon Europe - process

Strategic orientations



Work Programme

EC Policy Priorities	Based on the Political Guidelines for the European Commission 2019-2024 with a focus on three key priorities: Green Deal, Europe fit for the Digital Age, and Economy that Works for People as well as the new Recovery Plan, ERA and the ESFRI white paper
Objectives and Expected Impacts	Wider effects on society (including the environment), the economy and science, enabled by the outcomes of R&I outcomes (long-term)
Destinations	Packages of actions around which each Work Programme part will be designed, aimed at contributing to the objectives and expected impacts set out in the Strategic orientations. The Destinations will provide the policy narrative for the calls and actions included in the WP.
Calls for proposals	Each Destination will be implemented by means of calls for proposals. Each Call for proposals will include one or more topics, all with the same deadline.

Horizon Europe - Towards the first RI WP: definitions and approach

Strategic orientations

Work Programme

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Launch expected Q1 2021

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ESFRI White Paper 2020 *Making Science Happen*

Key messages

Research Infrastructures as an essential pillar of the ERA

Ecosystem striving for scientific excellence, transnational services, education and skills

Research Infrastructures as strategic investments

Research with impact that addresses complex societal challenges

Research Infrastructures as knowledge and Innovation hubs

Basis of European competitivness, with regional impact and global outreach

Coherence between European, national and regional priorities

Research Infrastructures for sustainable development and funding

Research Infrastructures as major promoters of Open Science

Interconnected services providing FAIR and **quality certified** Open Data

ESFRI´s contribution to Research Infrastructure policy

Ensure appropriate capacity

ESFRI

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European RIs vs COVID-19

Many EU Research Infrastructures and running EU projects are active in tackling the current coronavirus outbreak through the **provision of specific and customised RI services** and the support to the deployment and running of the ***EU COVID19 Data Platform***, *e.g.:*

- **European Virus Archive** and **TRANSVAC** for vaccine research
- **SoBigData-Plus** for big data analytics;
- **ERINHA** for high-risk pathogen safety labs;
- **ELIXIR** coordinating the storage of and access to biological data;
- **ECRIN** for clinical trials;
- **CALIPSO-PLUS** and **CERIC-ERIC** have a dedicated Fast Track Access for research related to the COVID-19.

The **Population Health Information Research Infrastructure**: a **new EU initiative** and a cornerstone of the emerging European Health Data Space, building on the EU Member States Joint Action on Health Information (InfAct)

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RIs in HE - Strategic orientations

New efforts are needed to ensure the contribution of research and technology infrastructures into Europe's wider policy objectives, thus maximizing the contribution of science and technology to the needs of the society and increasing Europe's competitiveness.

- **Destination 1:** Developing, consolidating and optimising European RIs landscape, maintaining global leadership
- **Destination 2:** Enabling an operational, open and FAIR EOSC ecosystem
- **Destination 3:** RI services to support health research, accelerate the green and digital transformation, and advance frontier knowledge
- **Destination 4:** Next generation of scientific instruments, tools and methods and advanced digital solutions
- **Destination 5:** Network connectivity - enabler for collaboration without boundaries

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Destination 1: Developing, consolidating and optimising European RIs landscape, maintaining global leadership

- Develop a European strategy for RI
- Building on the 57 ESFRI RIs and/or ERICs create a coherent, reactive and attractive RI landscape by stimulating new ideas, as well as by consolidating and reducing fragmentation at national and regional level
- Enhance the role of RIs for international cooperation and science diplomacy.

Destination 1 in a nutshell

- **RI concept development** - support development of new concepts for the next generation of EU RIs
- **Preparatory phase of new RIs** - support the implementation of the ESFRI roadmaps
- **RI ecosystem** - consolidate, enhance coherence and cost-effectiveness of the landscape and higher levels of RI integration
- **Support to ESFRI** - support coordination and implementation of activities
- **Strengthen the bilateral cooperation on research infrastructures with international partners**
- **International Conference on Research Infrastructures – in 2022** under the Czech Presidency
- **Transition to digital/remote RI service provision: lessons learnt, needs and best practises** - support the transition to digital/remote RI service provision

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Problem definition

- **Exponential increase** in the quantity/diversity of research data
  Science and innovation becoming increasingly data-intensive
- The majority of data (likely over 80%) **never make it to a trusted repository**
- Most data are not FAIR (Findable, Accessible, Interoperable and Reusable)
  The annual cost for the EU-28 of **not having FAIR** data >**€ 10 billion**
- ~ 50% of all research is **not reproducible,** partly due to data malpractice
- Addressing **global challenges** requires:
  - Connecting research **data silos** and bridging existing European research infrastructures;
  - Connecting research data with robust **computing technologies and fast connectivity**

Need for a robust European-scale environment for data-intensive science

Destination 2: Enabling an operational, open and FAIR EOSC ecosystem

Objective: Develop the European Open Science Cloud (EOSC) as an operational enabling ecosystem for FAIR research data commons leading to a "Web of FAIR Data and Services" for Science

Main drivers:

- Transforming the way research data is shared and exploited leading to better quality and more productive research results, new innovative and value-added services
- Facilitating scientific multi-disciplinary cooperation, leading to discoveries and solutions in key areas such as environment and health
- Improving trust in science through increased openness and quality

Destination 2 in a nutshell

EUROPEAN OPEN SCIENCE CLOUD

Remark: R&I priorities in the EOSC SRIA (under preparation) are being taken into consideration

- **Supporting Open Science practices and a digitally-skilled workforce** - help shifting research in Europe towards an Open Science model
- **EOSC-Core and services**– develop key functions to provide a fully operational environment to discover, access, share, and re-use data and services, including innovative services and procurement of the core service platform
- **Disciplinary/Multidisciplinary/Horizontal use cases and services for FAIR** – increase levels of FAIRness and FAIR-by-design data and other digital research objects
- **Support to specific entities**:
  - **Support to the new EOSC partnership during its start-up phase** - engage and align EOSC-relevant resources in Europe and enable the Web of FAIR data and services
  - **Support to International Standardisation**- for the development, adoption and implemention generic and/or domain specific research data solutions suited to the EOSC context.

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Destination 3: RI services to support health research, accelerate the green & digital transformation, and advance frontier knowledge

Objectives:

- Provide efficient and customised services (e.g. access to unique scientific tools, samples provision, processing and analysis, data services) to support an effective and responsive health and care system and accelerate the transition towards a green and digital future.
- Provide RI services to enable the advancement of frontier knowledge.

Main driver:

- Enhance long-term problem-solving capacity in areas linked to health and the green and digital transitions, including a better understanding of societal and economic implications.

Destination 3 in a nutshell

- **Research Infrastructures services to address European and Global challenge(s)** - effective and customised RI services and access provision to the scientific community and industrial researchers by national and multinational RIs.

- RIs services for

  - **rapid research responses to epidemics**
  - **support research addressing cancer**
  - **a sustainable and resilient agriculture and agro-ecological transitions**
  - **adaptation to climate-related risks on the environment**
  - **the development of materials for a circular economy**
  - **research on recovery from socio-economic crises**
  - **image analysis**

Destination 3 in a nutshell *(cont.)*

- **Research Infrastructure services for fundamental science** addressing specific large scientific domains on the basis of a multi-annual planning

- **EBRAINS - Empowering neuroscience for health and brain inspired technology** to cross-fertilise progress in neuroscience and advanced computing through comprehensive use-cases, effective and comprehensive Europe-wide service to users and training

Destination 4: Next generation of scientific instrumentation, tools and methods and advanced digital solutions

Objective:

- Develop ground-breaking RI technologies, i.e. scientific instruments, tools, methods, and advanced digital solutions, to enable new discoveries and keep Europe's RIs at the highest level of excellence in science,

Main driver:

- Ensure that Europe remains at the forefront of technological excellence and does so in cooperation also with industry

Destination 4 in a nutshell

- **R&D for the next generation of scientific instruments, tools and methods** - advance the state-of-art of European Ris, show transformative potential across scientific domains, serve a wide community of users and/or new areas of research and underpin the provision of improved and advanced services

- **Interdisciplinary Digital Twins** - digital replicas of living or non-living physical entities modelling and simulating ultra-complex phenomena and advancing scientific discovery, as well as delivering socio-economically beneficial technical and software solutions and services to interdisciplinary research communities

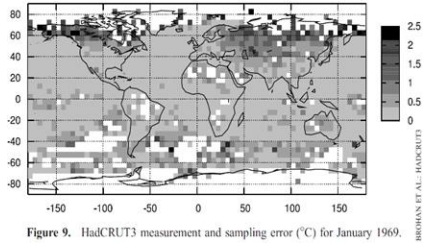
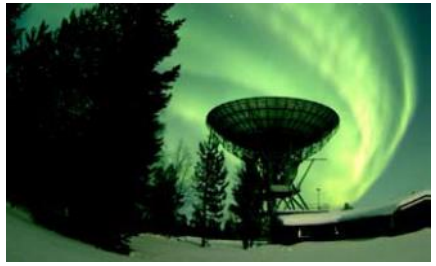


Figure 9. HadCRUT3 measurement and sampling error (°C) for January 1969.



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Destination 5: Network connectivity - enabler for collaboration without boundaries

Objective:

- Faster, resilient and secure connectivity with close to real-time applications, enable effective global collaboration of virtual communities
- Put Europe at the forefront of global R&E by creating the necessary conditions to attract data and talent and offering borderless collaboration services, ensuring very high-bandwidth, reliable and secure end to end cross-border connectivity and paving the way for widespread access to common European Data Spaces
- Achieve connectivity globally and foster Europe's international cooperation policy objectives via enhanced connectivity of the R&E networks between Europe and different parts of the world

Destination 5 in a nutshell

- Both EU internal and EU external dimensions covered

- Framework Partnership Agreement (FPA) providing overall goals for both:
  - ✓ To develop a new pan-European programme that meets the **huge growth in network capacity** and demand for advanced services and set the basis for a **paradigm shift** in digital science and computational infrastructures over the next 10 years.

- Activities of the Specific Grant Agreement (SGA) on basis of the FPA goals:
  - ✓ Operational excellence in connectivity and collaboration services (including innovation); user base widening: Collaboration with SMEs and industry; access to the European Data Spaces; convergence of AAI across Research and Education and towards e-IDAS
  - ✓ International collaboration with Regional Networks to ensure scientists & researchers access to world class RI worldwide; investments for long-term acquisitions of capacity and associated equipment for domestic and international connectivity

Thank you

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