#HorizonEU

THE EU RESEARCH & INNOVATION PROGRAMME

2021 – 2027

RESEARCH INFRASTRUCTURES

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Head of Sector Research and Technology Infrastructures Policy

14 December 2022

European Commission

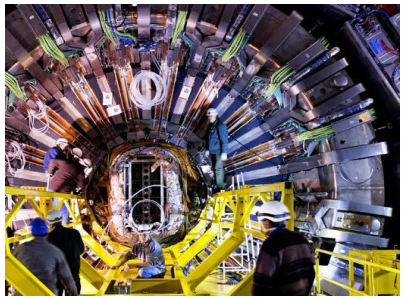
Research and Innovation

Research Infrastructures

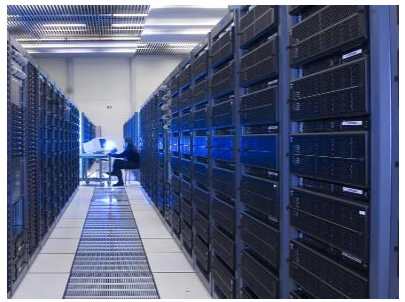
Facilities providing resources and services for research communities to conduct research and foster innovation (single site, distributed, virtual). They provide **access to external users**.

Knowledge-related facilities

Major scientific equipments



ICT infrastructures



e.g.: archives, collections, data infrastructures, telescopes, research vessels, FEL, computing systems, communication networks

Inter alia, RIs contribute to:

- ✓ Extend the frontiers of knowledge
- ✓ Exchange and transmit knowledge
- ✓ Train the next generation of top researchers
- ✓ Support industrial innovation

Research Infrastructures in Horizon Europe

Pillar 1
Excellent Science

- European Research Council
- Marie Skłodowska-Curie Actions
- Research Infrastructures EUR 2,4 bn

Pillar 2
Global Challenges and European Industrial Competitiveness

Clusters
- Health
- Culture, Creativity and Inclusive Society
- Civil Security for Society
- Digital, Industry and Space
- Climate, Energy and Mobility
- Food, Bioeconomy, Natural Resources, Agriculture and Environment

Joint Research Centre

Pillar 3
Innovative Europe

- European Innovation Council
- European innovation ecosystems
- European Institute of Innovation and Technology

Widening Participation and Strengthening the European Research Area

- Widening participation and spreading excellence
- Reforming and Enhancing the European R&I system

Research Infrastructures in Horizon Europe

Overall objective

- ***Empower Europe*** through **an integrated ecosystem** of world-class and accessible national and pan-European RIs, which help covering the continuum of needs from **fundamental knowledge creation** to **technology deployment** and **support the implementation of Open Science policies** as well as European technology leadership.

Strategic orientations for 2023-2024 WP

Same programming cycle: 2021-2024

=> main structure (Destinations and their expected impacts)

- ❖ however, flexibility on the expected outcomes to fully achieve those expected impacts i.e. may be different from WP 2021-2022
- ❖ what was considered:
  - ✓ Gap analysis: elements of the strategic plan or specific programme not covered by WP2021-2022
  - ✓ Lessons learnt: from the first WP cycle
  - ✓ Commitments made in HE implementation strategy (e.g. reduced complexity, simplified forms of costs, more bottom up topics, …)

Research Infrastructures Work Programme 2023-2024

Destinations

- **INFRADEV :** Developing, consolidating and optimising European RIs landscape, maintaining global leadership
- **INFRASERV :** RI services to support health research, accelerate the green and digital transformation, and advance frontier knowledge
- **INFRATECH :** Next generation of scientific instrumentation, tools and methods and advanced digital solutions
- **INFRAEOSC :** Enabling an operational, open and FAIR EOSC ecosystem
- **INFRANET :** Network connectivity - enabler for collaboration without boundaries

Research Infrastructures Work Programme 2023-2024

Key priorities (1)

- Consolidate existing capacities and develop new RIs to support **scientific breakthroughs** and **respond to new challenges**, notably in the field of **health and for the twin transition;**
- Provide **ERA** with an effective and sustainable RIs landscape, which will make it **increasingly attractive for researchers and talents from all over the world**.
- **Upsurge resilience of RIs**, particularly in the context of recovery from COVID-19 pandemic and the energy crisis;
- Contribute to **Open science & data policies** through a trusted virtual environment (European Open Science Cloud - EOSC)
- Offer high-speed connectivity to researchers (GEANT).

Research Infrastructures Work Programme 2023-2024

Key priorities (2)

- Address **global environmental, social and economic challenges**, in line with the renewed ERA;
- Contribute to **local and regional development** by supporting, inter alia, the implementation of Smart Specialisation Strategies;
- Develop **cutting-edge technologies** for RIs **and foster innovation;**
- Reinforce the **international dimension** of European RIs.

Key targets in 2023-2024

- ✓ Develop new concepts for the next generation of European RI **targeting gaps linked to key political priorities** or addressing emerging needs for new scientific discoveries and major knowledge advancements
- ✓ Accelerate the implementation of RI projects included in the ESFRI Roadmap in 2018, in order to provide the ERA with additional capacities
- ✓ **Consolidate and optimise** the European RI landscape through:
  - Strengthening and evolution of **individual** pan-EU RI, to improve their LTS and increase capacity to address EU policy priorities and support EU industry;
  - support to the development of complementarities, synergies and/or SLAs **between RIs**, or merging to reduce fragmentation and duplication of efforts.
- ✓ Monitor **implementation of ERIC Regulation** and contribution to ERA
- ✓ Enhance the **international dimension of ESFRI/ERIC RIs** and the International cooperation with Africa and/or Latin America in specific priority fields
- ✓ Support Presidency events and international conferences to increase visibility of RIs

Key targets in 2023-2024: access

- ✓ Topics to be supported under the **challenge driven** and the **curiosity driven** approaches identified through **MAPS** (Multi Annual Priority Setting) plan, taking stock of the results of previous calls and the analysis in the context of ESFRI and ERICs on how to better **complete and optimise the service offering of the RI landscape**
- ✓ **integration**, under same projects, of different types of research infrastructures, breaking barriers between networks of similar or complementary RIs

  challenge: defining the appropriate consortia of beneficiaries and the involvement of third parties;

- ➢ **co-fund of access provision** as identified gap from the Specific Programme
- ➢ Limited **development of new relevant services** is possible, including joint/cross-RI services, provided that the resulting services are opened and offered already under the actions (short term R&D) and that the long term sustainability of such services can be ensured by the participant RIs.

Key targets in 2023-2024: technology

- ✓ Deliver innovative scientific instrumentation, tools and methods to advance the state-of-art of European RIs, **address specific needs of the RI landscape** (in particular ESFRI and ERIC) and serve more advanced R&D, new areas of research, and/or a wider community of users.
- ✓ Simulate ultra-complex phenomena and advance scientific discovery through the development, **in synergy** with other relevant activities, of further Interdisciplinary Digital Twins - digital replicas of living or non-living physical entities, delivering technical and software solutions and services to interdisciplinary research communities.

RIs in other Horizon Europe pillars: examples

- ✓ HORIZON-CL6-2023-BIODIV-01-6: Restoration of deep-sea habitats (IA): Proposals should develop and test innovative and technically challenging active restoration of deep-sea habitats. "Collaboration with the relevant existing European Research Infrastructures is considered necessary"
- ✓ HORIZON-CL6-2023-BIODIV-01-12: Reinforcing science policy support with IPBES and IPCC for better interconnected biodiversity and climate policies (CSA) "This includes links to ESFRI research infrastructures, to test whether they could host predictive models, visualization and analysis of their platform's early warning systems, to respond to IPBES and IPCC assessments and to CBD requests, by participating in joint activities such as workshops, scientific deliverables, or joint communication and dissemination measures."
- ✓ HORIZON-CL6-2023-FARM2FORK-01-1: European partnership on accelerating farming systems transition – agroecology living labs and research infrastructures (Programme Co-fund Action) "Research infrastructures provide a wide range of services for research communities working in a long- term perspective."..."It should mobilise key partners and stakeholders, including ministries, funding agencies, research performing organisations, regions, local authorities, research infrastructures, living laboratories, farmers, advisors, industry, consumers, etc."..."Improve access to and use of services provided by research infrastructures and other relevant initiatives, for long-term measurement, observation and experimentation in support of agroecology. "
- ✓ HORIZON-HLTH-2023-ENVHLTH-02-04: Global coordination of exposome research (CSA): Proposal for options for a global governance structure for a Global Human Exposome Network taking advantage of and connecting to the existing research infrastructures and services in the area of the Exposome at the European level" ... "Proposals should interact with existing research infrastructures, services and research projects in the area of the exposome"
- ✓ HORIZON-HLTH-2023-TOOL-05-03: Integrated, multi-scale computational models of patient patho-physiology ('virtual twins') for personalised disease management (Research and Innovation Actions) "The proposals should adhere to the FAIR data principles and adopt data quality standards, GDPR-compliant data sharing, access and data integration procedures based on good practices developed by the European research infrastructures."

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Research Infrastructures Work Programme 2023-2024

Main novelties

- Preparation of **common strategies** for future development of RIs technologies and services within broad RIs communities;
- **Co-Fund action for access;**
- **Greening** the research infrastructures technologies;
- **Advancing the challenge-driven** approach complementary to the bottom-up, excellence-driven approach.

Research Infrastructures Work Programme 2023-2024

In a nutshell

- **5 Destinations**: packages of actions contributing to specific objectives with expected impacts
- **7 calls:** 4 calls in 2023 (deadline: 09/03/2023), and 3 calls in 2024 (deadline: 12/03/2024)
- **27 topics**
- **Other actions**:
  - **5 grants for identified beneficiaries:** ERIC monitoring, EOSC monitoring, 2 presidency events, enhanced depositing services;
  - **1 SGA** to the FPA for Research and Education Networks;
  - **External expertise**: reviewers; individual experts; ERICs evaluators.

~654 M€ total budget: ~320 M€ on topics/actions 2023, ~334 M€ on topics/actions 2024

Destination INFRADEV: Developing, consolidating and optimising the European RI landscape, maintaining global leadership

***Objective*: develop a European **strategy** for RI and create a coherent, responsive, sustainable and attractive **RI landscape**, by strengthening existing facilities, reducing the fragmentation at national and regional level, ensuring coordination among MS/AC, and strengthening national and regional R&I ecosystems. Enhance the role of RIs for **international cooperation**.

Expected impact:

- Disruptive research and breakthrough science and innovation through cutting-edge, interconnected and sustainable Research Infrastructures;
- Strengthened scientific excellence and performance and efficiency of the European Research Area, increasing its attractiveness to researchers from all over the world;
- Coordinated research infrastructure capacity among countries and regions, also by exploiting possibilities given by the smart specialisation processes;
- Reinforced R&I capacities enabling systemic changes needed for a truly transformative societal and economic recovery and a strengthened resilience of critical sectors, as outlined in the Recovery Plan;
- Improved European response, in cooperation with international players, to emerging socio-economic and related scientific and technological challenges at global level.

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

Objective: Provide efficient and customised **research and innovation 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. At the same time, RI services will also continue enabling the advancement of frontier knowledge.

Expected impact:

- Reinforced research infrastructures capacity to provide at scale and across the EU services to **support** excellent research to address **societal challenges, and Horizon Europe missions and partnerships**' objectives;
- Enhanced and increased **society's long-term and consistent problem-solving capacity** and **evidence-based policy making** in areas linked to health, and the green and digital transition, including a better understanding of socio-economic implications, through the provision of innovative, customised and efficient RI services;
- New **discoveries and knowledge breakthroughs** enabled by access provision to the best and in some cases unique state-of-the-art RIs;
- A new generation of **researchers trained** to optimally exploit all the essential and advanced tools for their research;

Destination INFRASERV: main features of all topics

- Focus on **trans-national access** in-person or remote and **virtual** access
- Bring together **several complementary and interdisciplinary** RIs
- Access includes ***ad-hoc* training** and scientific and technical **support to users**
- **Harmonisation, customisation** and **virtualisation** of RI services, and activities to facilitate and integrate the access procedures, also supported
- Access is provided to existing services, but **limited development of new services**, relevant to the challenges, can be supported, including joint/cross-RI services, provided that they are **offered already under the actions** and that their **LTS** is ensured by the participant RIs
- Access provision in line with the European Charter for Access to Research Infrastructures
- Address data management, interoperability and connection of digital services to the **EOSC**
- **Access can be provided**, under certain conditions, **to researchers in third countries**. **Third countries' RIs** may be **involved and funded** when there is an **EU benefit**, e.g. they offer complementary or more advanced services than those available in MS/AC.

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

Objective: **Develop** ground-breaking **RI technologies**, i.e. scientific instrumentation, tools, methods, and advanced digital solutions which underpin the provision of improved and advanced RI services to **enable new discoveries** and keep Europe's RIs at the highest level of excellence in science, while paving the way to innovative solutions to societal challenges and new industrial applications, products and services.

Expected impact:

- **Enhanced global competitiveness and technological excellence** of Europe in an extremely fast-moving environment through investments into the development, of forward-looking technical instruments and tools for European RIs.
- **Enhanced competitiveness of European industry** through co-development with industrial actors of advanced RI technologies and technology transfer;
- Opening up of **new areas of research and development** of new industrial applications/products;
- **Development of skills of RI staff** aligned with the advancements of the RI technologies;
- Trans-disciplinarity, cross-fertilisation and a wider **sharing of knowledge and technologies between academia and industry**;
- Wider use of AI in research and enhanced data based research across Europe.