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#SmarterFutureEU_RIs

EUROPEAN RESEARCH INFRASTRUCTURES
for a Smarter Future

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Hrvatsko predsjedanje
Croatian Presidency of the
Vijećem Europske unije
Council of the European Union



Digital Conference

ESFRI

"EUROPEAN RESEARCH INFRASTRUCTURES FOR A SMARTER FUTURE"

CONFERENCE CONCLUSIONS

15 MAY 2020

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INTRODUCTION

Research infrastructures are key elements in providing the necessary data and services for European scientists to conduct cutting-edge research in a variety of scientific fields and for European business to develop new products and services. They foster development of new types of materials enabling their analysis down to molecular level and testing in extreme conditions. They enable the development of modern technologies for exploiting various energy sources, developing new treatments for illnesses, or making our cities more liveable. They give us tools to understand better our universe, our planet and ourselves as humans.

Our shared investments in Research Infrastructures in the last decades have equipped us with some of the most advanced and sophisticated facilities in the world. It is now vital to harness the full potential of these infrastructures to deal with complex questions and more effectively serve industry, to contribute to education and jobs and to improve citizens' lives. We need a stronger focus on the direction and societal impact of our shared investments.

The overall objective of the conference was to explore the potential of European Research Infrastructures to make a meaningful impact on the European strategic agendas and identify the ways in which this could be achieved. The outcome of this high-level event provided a new impetus for the European research infrastructure policy, supporting full realisation of the potential of the European Research Area to drive the necessary changes in our economy and society.

The conference was hosted by the Croatian Presidency of the Council of the EU, as part of the Future of Research Infrastructures in European Research Area event. The conference generated huge interest from the community. Since the conference was organized as a video-conference, over 600 participants followed the conference throughout the day while in the policy panel over 800 participants followed the discussion. The conference was recorded in full, and the resulting videos are available in [ESFRI YouTube channel](#). The presentations of each session, as well as the RI posters and RI videos featured in the virtual poster session are published online in [ESFRI website](#), in the conference [Outcomes webpage](#).

MAIN MESSAGES

The conference was composed of four sessions and concluded with a high-level policy panel identifying directions for the future of European research infrastructures' policy.

1. Session: "Research Infrastructures and the European strategic agendas – Green Deal and Energy Transition" ([Session 1 Video](#))

The European Green Deal is the most ambitious package of measures covering a number of topics that should enable European citizens and businesses to benefit from sustainable green transition. The European Green Deal is also an integral part of the European Commission's strategy to implement the United Nations' 2030 Agenda and the Sustainable Development Goals with the strong contribution of science and research. At the same time, the European Commission's Energy Union sets ambitious targets for 2030 in renewable energy and energy efficiency and promotes the creation of European value chains in emerging sectors like batteries and hydrogen. In the efforts to achieve these objectives, research and innovation need to contribute.

Research infrastructures (RI) are a main pillar in creating an inclusive and impactful European Research Area.

RIs enable a more synchronized co-evolution of R&I systems, strengthening their quality and excellence, reducing inequalities and fragmentation, and fostering mobility and collaboration. RIs are crucial centres for studying and developing science-based and nature-based solutions to global challenges.

An organized and well-coordinated European RIs ecosystem, as enabler of excellent science and ground-breaking innovation, can provide an important contribution to the EU's strategic agendas.

The recent [ESFRI White Paper: "Making Science Happen"](#) clearly demonstrates the relevance of RIs for the European Green Deal, the Energy Union and other important European endeavours. RIs help linking findings across different disciplines, boosting integration, innovation, transfer of technology and high-tech economy growth as well as supporting the development of European technology hubs.

The European Green Deal and the Energy Union offer multiple opportunities for the development of RIs.

New opportunities appear for the RIs to expand by further developing science and technology in supporting the Union, assisting policies and serving new communities and initiatives. RIs can further improve their effectiveness by developing synergies with public funding, businesses, and industry, towards a new innovation landscape. Cross-domain integration, technical composability, community de-

fragmentation should be fostered in a wide spectrum of topics, such as clean energy and development of new carbon-free energy sources, sustainable industry, building and renovating, sustainable mobility, biodiversity, from farm to fork or eliminating pollution.

2. Session “Research Infrastructures for Regional Development” ([Session 2 Video](#))

Research Infrastructures have already been proven to have a powerful social and economic impact as a multinational venture, helping to solve global challenges. Besides boosting the scientific excellence, they can enhance the innovation potential of enterprises, provide innovative services for SMEs and foster academia-industry collaborations. They can also help reduce the gap in science and innovation across EU regions and strengthen regional economies, which is, for example, the aim of the South East European International Institute for Sustainable Technologies (SEEIIST), currently under development.

To fully utilise the potential of Research Infrastructures across Europe, it is important to provide a harmonized RDI strategies and funding ecosystems at regional, national and European levels.

The regional (Smart Specialization Strategies), the national (National strategies and Roadmaps) and the European (Horizon Europe and ESFRI) initiatives need to be supported in a fully complementary manner. This should be the guiding principle for a strong alignment between regional, national, and European research and innovation policies and a better synergy between regional, national and European funds.

Successful regional development strategies can be based on local innovation ecosystem where Research Infrastructures play a central role.

To develop an effective, science- and knowledge-based innovation ecosystem, it is vital to gather not only a concentration of large-scale analytical facilities but also

technology infrastructures, academic and applied research institutes, higher education institutions, plus all-size industry, including start-ups.

At the same time, while working closely with local public authorities and the local community, the regional knowledge and innovation hub needs to be part of a wider scientific community and be connected to the broad European innovation network. This helps to regularly attract more investments which are necessary to maintain excellence in science and technology, but also to continuously develop partnerships with companies engaged in the leading-edge technology at the national and international levels. However, a priori, any new investment needs to be carefully assessed, from the point of view of existing gaps and the needs of society and local businesses and considering the available skills and competence base in the region.

For a competitive Europe, it is crucial to recognize research infrastructures as a core of EU's R&I capacity, achieving pan-European cooperation in coordination, including investments.

Regionally anchored RIs are a possible solution for revitalization of the economy in post COVID-19 world, if their knowledge generation capacity is fully utilised, creating sustainable R&I networks and new value chains.

3. Session "Research Infrastructures in the fight against COVID-19" ([Session 3 Video](#))

The COVID-19 outbreak is an unprecedented public health crisis in Europe in the last decades. All relevant European and international stakeholders, including Research Infrastructures (RIs), have been working together to provide a coordinated response to the challenges the pandemic has brought on.

RIs have made significant contributions to the effective response to the COVID-19 outbreak.

Operation: RIs have been at the forefront helping academia and industry by keeping in operation the instruments needed to advance the fight against COVID-19, with specific quick access programs.

Cooperation: The community of European Research Infrastructures has demonstrated clearly that RIs across various scientific fields have created robust frameworks for cooperation and can effectively respond to emergencies, facilitating cross-border, multi-sector, and multi-disciplinary collaborations. In the same spirit,

creation of task forces for specific crisis issues and other such initiatives will improve RI cooperation greatly.

Dedication to Society: RIs have been answering societal challenges, contributing significantly to the economic and social recovery after the pandemic, and playing crucial roles in education, industrial development, and innovation.

There are several issues to be addressed in the future to ensure greater resilience and better responsiveness of the European research and innovation system in the face of emergencies.

Improve coordination: There is still fragmentation of national strategies on research and health, hindering further cooperation. Policy makers should be encouraged by the COVID-19 experience to take further advantage of RIs and improve the level of cross-border coordination. The creation of a Coordination body should be proposed to the European Commission.

Foster sustainability: National and European policy makers should acknowledge the importance of RIs and should support them fully. In particular, some RIs are funded through grants covering their activities only for a certain period of time. RI sustainability should be guaranteed through long-term funding.

Increase internationalization: Links with international health organizations, such as WHO, OIE, FAO, and CDC, should be strengthened, not only on human health but also in the animal and plant domains.

4. Session "Making Science Happen – a new ambition for Research Infrastructures" ([Session 4 Video](#))

Europe needs an integrated, interoperable ecosystem of Research Infrastructures underpinning the ERA.

The systemic nature of the transformation that is needed bears important consequences for public policy and public policy itself impacts the way this transformation will happen. The European research and innovation policies and programmes must be therefore designed to enhance the lives and livelihoods of people and enable resilience by design across European and global communities so as to prepare for future shocks and build a better tomorrow.

Supporting excellence in Research Infrastructures across the whole of Europe is the best way to ensure that we have the research capacity to deal with future challenges, like the recent pandemic, and to strengthen our economies for a knowledge-driven recovery.

We need to consolidate the existing Research Infrastructure landscape and continuously strengthen its capacity through investments in unique, cutting-edge scientific instrumentation and services, working jointly to serve researchers' needs across disciplines. At the same time, the impact of Research Infrastructures must be reinforced across the "Triangle of Knowledge" (Research-Innovation-Education), underpinned by increasing coherence between European, national and regional priorities and policies for Research Infrastructure development and funding, fostering inclusiveness of the European Research Area.

Universities, as frequent hosts of research infrastructures, are the engines of scientific and technological excellence.

Universities and research infrastructures need therefore to work in partnership to shape the future of ERA and tackle the impact of COVID-19. This joint work could for example, focus on a recognized qualifications framework for research infrastructure staff and the revision of the European Charter for Access to Research Infrastructures and its application.

New research data-sets must be FAIR by design which implies large investment in technology at RIs and well-trained human resources.

This will enable innovation to be at the core of a coordinated European COVID-19 recovery response and by increased data sharing and use well beyond individual RIs or scientific domains. The COVID-19 is prompting pioneering initiatives towards interoperability of research and clinical data, that should be pursued for all European science.

CONCLUSIONS

This pandemic proved that research and innovation is what made and what drives our civilisation.

European RIs play a crucial role in our common fight against COVID-19 and they will be essential for the recovery and definition of the 'new normal', helping the economy to 'bounce forward' instead of simply 'bouncing back'.

To achieve this, especially in this time of budget cuts, it is important that we emphasize strategic importance of research infrastructures for the competitiveness of our economy and their benefits for improvement of everyday life. Effects of the substantial public investment in RI do not appear at once, but in the long term constitute the basis for competitive research and maintenance of the highest international standards. If, for example, long term thinking on the fundamentals of viruses started decades ago, there might not have been a corona pandemic today.

There are gaps that hinder and delay the full exploitation of the facilities we have developed in Europe and their impact on societies and industries.

Members States reached admirable progress in the last 20 years with the support of ESFRI and the European Commission to build up strong political interest and investment in RIs, including through European Structural and Investment Funds. However, enabling synergies of investments from Horizon Europe, structural and other funds will be crucial for the following financial period and not just for research infrastructures. We thus call for further efforts within the Commission services to enable more effective synergies of investments from different funds. Large research infrastructures require significant funding and we should not allow their stagnation but intensify our efforts to:

- ensure their sustainability,
- increase their impact in tackling key societal challenges,
- connect them to relevant partnerships, missions and other initiatives on EU and national levels and
- increase visibility of their results among citizens.

Securing the cooperation between RIs with relevant European partnerships and missions would increase visibility of their outputs and enable additional funding through synergies.

More effort needs to be made to better stimulate usage and access to RIs in funding schemes, especially for Widening countries.

We need to avoid the principle where everyone wants to have RI on their territory. New national measures and strategies for entering new international collaborative networks and large infrastructures should be initiated, increasing the participation in European strategic research infrastructures of those countries with low gross domestic expenditure on R&D (GERD).

Now is the perfect time to work on the synergies, considering the COVID-19 pandemic as it has showed us that all Technology Readiness Levels are equally important in finding the cure. For the successful use of structural funds, some changes in the national research systems are needed, including the reforms of laws, and the current situation can be a boost in that direction.

Pan European research infrastructures have a key role in achieving two priorities of Croatian Presidency in the field of research and education – Brain circulation and Future jobs.

Physical distribution of key research infrastructures is not well balanced throughout the EU. Therefore, access to their resources and the circulation of knowledge, people and innovations within Europe is even more important. The circulation of ideas and building on data and results of researchers all over Europe and the world will be crucial for the fast development of vaccine against COVID-19. The increase of effectiveness and sustainability of research infrastructures in the EU is thus needed, and improvement of the exchange of information on the existing capacities. Due to this, we need to stimulate the role of RIs in education and training of students, researchers and other experts.

One of the concrete suggestions inspired by the RI that attracts most foreign researchers would be to create a mobility and training activity that could be funded jointly between RI and MSCA work programmes. This scheme could increase training opportunities and attract talents to countries with lower level or R&D investments.

Another possible approach would be teaming activities between the low and high performing Member States based on the scientific excellence in order to maximize the utilization of the most advanced research infrastructures and foster collaborative networks through creating new or significant upgrading of existing centres of excellence.

The renewed European Research Area needs to step up the efforts, building up our R&I capacities, by enabling and promoting the excellence, inclusiveness and sustainability of the European RI landscape and its impact.

In order to further develop Research Infrastructures in Europe, we need to focus first on serving the needs of science, with a strong role of research communities, as scientific excellence is a precondition for impact. This will allow us, with smart “directionality” in the future ERA, to use RIs to enhance our international competitiveness in key research areas and address big societal challenges, as well as enable solidarity and leadership in meeting the objectives of the Green Deal. We also need to further strengthen the robust governance model for the European Research Infrastructures established through ESFRI.

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