

## LERU's contribution to the strategic development of the Research Infrastructure (RI) landscape for the European Strategy Forum on Research Infrastructures (ESFRI)

LERU is an association of 23 leading research-intensive universities in Europe. LERU has been active in campaigning for better visibility and support for research infrastructures (RIs) for several years. In 2017, we outlined in our paper [Four Golden Principles for Enhancing the Quality, Access and Impact of Research Infrastructures](#), how the largely untapped potential of smaller and medium sized RIs could be achieved through facility sharing, (transnational) access, international coordination and sustainability. In September 2022, we outlined in our paper [Developing a strong, politically and societally relevant research infrastructure ecosystem in Europe](#) our further thoughts on the barriers facing research infrastructures of all sizes.

It was encouraging to see that under the Czech Presidency<sup>1</sup>, the role of small and medium-sized RIs, which have so far had a much lower profile than the larger RIs, received the recognition they deserve as vital components of the research ecosystem. LERU was delighted to see that many of the key issues which had been identified as being problematic for universities regarding RIs, were identified as clear action points by the European Council<sup>2,3</sup>. However, it was unclear who would lead on several of the suggestions from the Council conclusions.

We are pleased that ESFRI is carrying out this landscaping study at a time when geopolitical tensions have led to an emphasis on improving European research and industrial competitiveness, on Open Strategic Autonomy, and where the role of RI in addressing the key social and technological questions of our time is unquestioned. We understand that many of the issues covered by the Council Conclusions will be under development, and thus it is perhaps too early to assess our additional thoughts on these issues.

In the interests of limited space, we would like to take the opportunity to highlight several issues which still concern us as universities, several of which we know have been discussed (at least in part) within the Council Conclusions document<sup>4</sup>. Should further information be required, we would like to point the reader towards LERU's papers and statements on RIs<sup>5,6,7</sup> or to encourage the reader to contact us directly with any questions they may have.

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<sup>1</sup> <https://data.consilium.europa.eu/doc/document/ST-15429-2022-INIT/en/pdf>

<sup>2</sup> <https://data.consilium.europa.eu/doc/document/ST-15429-2022-INIT/en/pdf>

<sup>3</sup> <https://www.leru.org/news/bravo-to-the-eus-competitiveness-council-for-recognizing-the-value-of-all-sizes-of-research-infrastructures-to-the-renewed-era>

<sup>4</sup> <https://data.consilium.europa.eu/doc/document/ST-15429-2022-INIT/en/pdf>

<sup>5</sup> <https://www.leru.org/publications/four-golden-principles-for-enhancing-the-quality-access-and-impact-of-research-infrastructures>

<sup>6</sup> <https://www.leru.org/publications/research-infrastructures>

<sup>7</sup> <https://www.leru.org/news/bravo-to-the-eus-competitiveness-council-for-recognizing-the-value-of-all-sizes-of-research-infrastructures-to-the-renewed-era>

## 1. What are your priorities regarding the European RI ecosystem? / 2. What are the gaps and needs for RIs and their services in each domain and across domains?

For small and medium-sized RIs, we see two general challenges for the near future that apply for large RIs as well. And they are very closely related to important contributions of RIs to current societal challenges. These are 1) Data management, and 2) Flexibility and Resilience of RIs.

### 1) Data Management:

Large amounts of data are produced in many RIs. It can be expected that the data output will increase further in the future. Data acquisition involves a lot of energy, material consumption and labour. Nevertheless, the data are analyzed most frequently for a single purpose only, although they might contain valuable information for other purposes. Currently, we see that EOSC is not receiving sufficient support from the academic community as there is a lack of understanding of the benefits of FAIR and Open data amongst scientists. The lack of information about existing data sets and the lack of easy usable tools for getting access to data sets are the dominant reasons for the lack of data recycling. In addition, scientists hardly provide their data sets with sufficient metadata to be analyzed without their further assistance by others. In some countries, there is a lack of adequate infrastructure, and lack of joined up approaches in some countries. Consequently, data sets might be stored in discipline specific repositories. But they will not be used except for documenting the published conclusion from the initial research project.

**ESFRI funding should provide resources for sustainable data management.** This should include defining research-field specific standards about metadata and storage formats, establishing well-known data libraries, developing, and implementing tools to recycle data sets generated by others, clarifying data property rights and data protection rules etc., and finally offering training programs to scientists. The European Commission should provide funding targeted at research-intensive universities to encourage them to develop EOSC-facing programmes both within and outside of RIs.

### 2) Flexibility and resilience of the RIs

The requirements on RIs are driven by societally relevant research questions and technical opportunities. Both evolve rapidly or even by leaps and bounds in a crisis. This has two components: staff and equipment.

RIs must have sufficient and project-independent resources to train their staff constantly at the level of researcher expectations and technical developments. LERU members consider it easier to obtain funding for developing new infrastructures than for the retention and training of their staff, which is ludicrous, given that the expertise of the staff is crucial to the operation of RIs and developing new capabilities and we are pleased that the issue of staffing received a high visibility in the Council Conclusions of December 2022. New models for employing such specialized, skilled staff, and ensuring that they have adequate training and career development options, need further investigation and discussion, as this would help further de-risk investments in RIs.

Finally, it is vital that a RI can respond to equipment needs to ensure it stays at the forefront of developments in its area. LERU has long argued for a long-term sustainable financing streams for RIs, which covers all aspects of an RI's life, including, if necessary, decommissioning. Universities are challenged by unclear, and inconsistent funding schemes, and how to combine various funding schemes to support an RI. Hence, a sustainable institutional funding is important for the long-term operational effectiveness and quality of services of RIs.

Finally, it is sometimes challenging for some RIs to be open *and* free for users. There is a stigma around having to pay for access to databases, even though it is necessary to pay for people to maintain and upgrade the RIs. So, whilst open access is of course laudable, it is difficult to provide this if the RI needs to be funded by user subscriptions.

**ESFRI funding should provide resources for sustainable expertise and human resource development activities as well as maintenance and renewing of tangible and intangible infrastructure.**

### 3) Other points to note

- Our universities have outlined how it is not easy to find out how to join a RI once it is established. Better information on how universities can join an RI is needed.
- Barriers to the transportation of samples and materials (including live and biological material) should be addressed to improve access to RIs from other countries.

### 3. How, in your opinion, could RIs best contribute to crisis, HEU Missions, Green and Digital Transformation

We should enable RIs to respond on changing demands as effectively as possible. To achieve that goal, RIs must have the capacity to respond flexibly and to be resilient.

Many of the major societal challenges of today need to be addressed through an interdisciplinary approach and at a level that exceeds national or regional boundaries. In LERU's view, there is a great opportunity for Europe to develop an innovative approach to the funding of RIs, one which brings together the natural sciences, engineering, humanities, and social sciences, where appropriate, to address societal needs, in addition to the largely targeted, disciplinary focus we have seen so far. Effective clustering of RIs with complementary expertise across disciplines would be an effective route to address societal issues.

Given the current geopolitical climate, it is important to ensure that RIs are aware of what information can be shared, when, with whom and how and if they can collaborate with certain institutions.

ESFRI should seek to support the role of RIs as centres of expertise, especially on topics that are controversial in society. It is imperative that sound scientific knowledge remains the basis for policies, realising that this is increasingly questioned by often isolated groups in society.

RIs of all size that operate complex infrastructures will consume significant amount of process energy. However, RIs usually utilize the capacity of infrastructure better than equipment that is placed in a research unit. Thereby, the outsourcing of data acquisition to RIs is an effective measure of green transformation. The avoidance of data acquisition activities is the most effective approach to prevent energy and raw material waste. Therefore, the recycling of existing data sets should be promoted as much as possible.

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LERU, April 2023.