ERIC Forum Contribution to ESFRI Landscape Analysis

25 European Research Infrastructure Consortia (ERICs) have been set up officially by the EC. As key pillars of the European Research Area (ERA) they are providing their services to researchers across all scientific domains as well as operational users and industry. ERICs are financed by their member states for their basic implementation and upgrades, operation and service provision. ERIC Forum represents a very diverse community: some ERICs provide physical access to facilities while others rely largely if not exclusively on virtual access. Similarly, in contrast to others, some ERICs provide all data in Open Access, cannot deliver any direct service to industry, or may have to sustain operational monitoring duties. ERICs may therefore have different expectations and requirements regarding their position and role in the European ecosystem of RIs.

Since 2017, ERIC Forum has ensured the coordination of activities of joint interest for the ERICs with the aim of strengthening coordination across ERICs, advancing ERICs' implementation and operation, collectively tackling common challenges, and sharing best practices and knowledge to support both established ERICs and ERICs-to-be. The ERIC Forum has also effectively interacted with the EC and other key stakeholders of the ERA (including ESFRI, EOSC-Association, ERA Forum, and others) and strategically contributed to the development of related policies, making it one of the leading science policy voices in Europe.

1. What are your priorities regarding the European RI ecosystem?

ERIC Forum wishes to strategically contribute to the development of the European R&I arena. We recognize ERICs to be long-lasting Research Infrastructures in the ERA, providing cutting edge service and thereby enabling excellent research, while having a strong user base. In view of this ERIC Forum expresses its interest also to co-design the policy aspects of the research and innovation developments in Europe. ERIC Forum continues to strengthen the operations of ERICs via the clusters and would like to approach in a proactive way cross-cluster collaboration, especially to be able to address the key societal challenges. In the long- term ERIC Forum wishes to have strategic links also to key science-policy actors beyond Europe, in order to support the international activities of ERICs in an overarching way.

ERIC's contribution to Open Science

ERICs are key enablers of Open Science and their quality-managed services facilitate FAIR research data and outputs. From their outset, ERICs are deploying Open Science principles and are best practice examples. Therefore, ERICs and their users are key stakeholders for the EOSC, as infrastructure providers, developers, and users, populating EOSC with research data, software tools and workflows. ERICs are digitising their data life cycles through standardisation, automation of instrumentation and operational procedures, employing and training of FAIR data stewards, provision of open access data repositories, and more. ERIC Forum recommends further supportig and scaling collaborations between RIs and their users on the one hand, and EOSC as well as the European 'Data Spaces' on the other. This can take place by further interlinkage between existing data resources of the different ERICs as well as resources that are developed in different projects in which ERICs take part (e.g. science cluster projects and sustainability of their outcome), and more support for data mobilisation and digitalisation of ERICs. Support for FAIR data stewards as a young profession also is key. FAIR data stewards are helping RI users to acquire and make openly accessible their FAIR research data. The increasing demand exceeds the available expertise, and built-up of education, training and other career support mechanisms is crucial.

The role of clusters in integrating resources

Scientific clusters of ERICs are formed within ERIC Forum. This is a good way forward. The drawback of this activity is the fact, that European priorities require multidisciplinary approaches (e.g., combining SSH with ENVI and HEALTH for solutions around the Green Deal). Beyond clustering, integration of ERICs (and other RIs) among themselves given the variety and specificity of missions, expertise and resources, is difficult. Yet, given the complementarity of some ERICs for addressing, for instance, specific societal challenges, there is room for improvement at the level of collaboration frameworks and, hence, the governance of the system.

Eligibility for national funding is crucial for ERICs' long-term sustainability

Both single/multisite ERICs and distributed ERICs were built by combining national, European, and cohesion policy resources. They are an example and a flagship case of combining resources for the preparation and construction of research infrastructures in Europe. ERICs' operations are supported from contributions of their Members, Observers and partners. In addition to this, project financing is to be applied for specific purposes. This is possible only by combining resources from different providers. The eligibility for national funding is crucial for the sustainability of ERICs - for both, the Nodes and the Hubs. By combining national resources into a pan-European RI, ERICs increase the value of national investments. There are several examples of impacts reported by ERICs in terms of national and regional benefits (e.g. increased visibility, more participation

in European projects, etc.). Allowing ERICs to participate as direct beneficiaries in national projects can increase its interaction with national RIs, and therefore the benefits for the members states.
The distributed ERICs hubs/central units are connected to tenths of national nodes many times constituted by even more national research infrastructures and labs. The central hub is usually supported from Members´ contributions and some European projects, the nodes by a combination of resources specific for the state they operate in. This makes an integrated management rather difficult for the ERIC. Therefore, more needs to be done to raise visibility of ERICs on the national administrative level, i.e. beyond the ministry in charge of ERIC, but also at other ministries and with authorities on regional and local level. More visibility and connection could be also achieved nationally on connecting different ERIC's Nodes and thereby reaching across clusters on the national level. Improved reach out and visibility among research institutions, researchers, and users will also be crucial to generate both better efficacy, impact, and return on investment from the ERICs. National and European Roadmaps need to be more aligned and the implementation of Roadmaps in National and European funding needs to be ensured.

Identifying and launching future RIs
Having more ERICs (and other European research infrastructure projects) underway, for the future there needs to be a check whether the scope of ERICs to be created could not be integrated in existing ERICs. As this is a very central question for many ERICs as well as their member states, ERIC Forum is suggesting being more formally included in this specific question of the landscape analysis by ESFRI. In addition, ERIC Forum offers to provide relevant contacts and information e.g. via its future public online platform which will provide detailed information on existing ERICs.

2. What are the gaps and needs for RIs and their services in each domain and across domains?

ERICs are key facilitators of excellent science by providing a vast variety of cutting-edge services to the European research community, strengthening and contributing to the international positioning of Europe’s research and innovation capacity and the potential of having a strong socio-economic impact. Furthermore, the reach of services that ERICs offer often goes well beyond supporting ‘just only’ research, but having much broader socio-economic impact in all fields, whether it is life-sciences, social sciences and humanities, environmental or physical sciences. Thus ERIC services are to be seen as being fundamental and benefitting all of Europe’s citizens and therefore need to be supported and tapped by a much broader group of stakeholders. However, despite the tremendous assets and strongholds of the ERICs, and the efforts invested by the ERICs to promote their visibility, still most researchers are unaware of their existence, due also to the relatively short time they have been established. Their visibility must be significantly enhanced, first among scientists, then as well among public health care and community service organisations, not only to enhance research and provide tools to tackle scientific questions, but also to underpin policy and societal issues. Therefore, ERIC Forum recommends that

- Future European as well as national funding programmes better enhance and highlight use of ERIC services, and thus increase the coherence and impact of ERICs in the ERA.
- This can be achieved by integrating the ERIC services into call texts, not just as an eligible cost within successful projects, but as an encouraged resource which should be utilised wherever possible in alignment with the proposed research project.

- Applicants should be encouraged to describe the ERIC services they would require and make use of at the application stage. Greater prominence should be given to the use of the ERICs as ERA instruments, not just in the Research Infrastructures work programmes, but across the Pillars and other relevant policy programmes.
- Future EU Operational Programmes should acknowledge ERIC services as public services and accordingly provide funding, so that they become available to the broadest possible community. This will further increase their wider impact on society in the ERA.
- Attention should be paid to the possible funding gap between development of services and implementation/operation of services.

3. How, in your opinion, could RIs best contribute to:

i) Finding solutions to the crises: RIs in support of crisis management but also their own increased resilience when faced with crises caused by natural and man-made hazards such as health, environment and energy:

The critical role of robust, interconnected and sustainable pan-European access was further showcased during the COVID crisis underscoring their contribution as strategic assets for tackling critical global scientific and societal challenges. Increasing Europe's preparedness and resilience based on RIs in support of crisis management can be achieved by i) further consolidation of ERICs' integration in the ERA, ii) addressing fragmentation, and reinforcing coordination, governance and sustainability of ERICs, iii) improving links with society, economy and competitiveness, and iv) strengthening the global approach.

ii) HEU Missions: Covering the five ESFRI roadmap research domains (energy, environment, health & food, physical sciences and engineering, and social and cultural innovation) at a leading international level, the ERICs hold a tremendous asset for covering the needs in all these research domains as well as addressing global grand societal challenges of humankind, including the UN Sustainable Development Goals and research questions related to those. Importantly, the ERIC capacities are extremely relevant and well-positioned to respond to the five Horizon Europe Mission Areas. Remarkably, while the ERICs and ERIC-driven projects (e.g. canSERV and AgroSERV from among the INFRASERV-projects) are referred to in some of the Mission Calls of the current Horizon Europe Mission Work Programme, these links are still very limited, thus inadequately reflecting the potential and importance of the ERICs in achieving the Mission goals. Therefore, ERIC Forum recommends that

- ERIC capacities are further integrated into the Mission Work Programme both in terms of direct ERIC involvement, as well as by connecting existing RIs to the relevant Mission programmes.
- Visibility of the ERICs is essential at all levels and is further increased significantly; towards the researchers and the national-level communities ensuring the ERICs expertise to be onboarded in activities supporting the realisation of the Mission areas (e.g. in the National Cancer Mission Hubs).
- ERICs are recognized as important partners in the Missions, and that the ERICs should therefore be involved in contributing to the development of the Missions (e.g. through the Mission Assemblies / Boards / Working Groups, or any other suitable means) to facilitate the ERICs' alignment and contribution towards the Mission objectives.

- If ERICs are foreseen as essential operators of the Missions and even considered as building blocks they ought to be closely associated with the Mission planning in order to ensure that they can respond to the expectations.

iii) Green and digital transition, also through their own transformation

There are three areas where the twin transition can happen in many ERICs. First - in particular for new, single-sited ERICs -, during construction and upgrade, measures to reduce energy consumption and enhance digitalisation can and should be taken. Second, during operations, such technologies and instrument modes can be chosen to reach the same goal. Third, it is important to understand that the research and scientific strategies of ERICs do, and in the future should take into account the fulfilment of societal priorities including twin transition. ERICs are indispensable for reaching the goals of twin transition and solving other societal challenges of our times. Therefore, we suggest starting a broad discussion on assessing the development in these three areas for ERICs, also taking into consideration their broad diversity of set-up (single-versus multi-sited; size) and mode of operation.
In the pandemic situation in 2020-2021, rapid measures were taken to ensure access to the "critical research infrastructure" in Europe. It is important to leverage this experience to learn how to make remote access a routine tool, while again respecting the different types of ERICs and their individual needs. We feel that awareness of the associated increase of cost to enable and maintain (digital) remote access must be appreciated and future programs need to integrate the aspect of staff and user training. These moves will also have a positive impact on the CO_2 footprints of the European RIs.

The relevant ERIC Forum position papers are available here:
https://www.eric-forum.eu/2020/09/21/eric-forum-position-papers-overview/

1. Comments in view of the third Commission Report to the Council and the European Parliament on the implementation of the ERIC Regulation (April 2022)
2. ERIC Forum Position Paper to EC public consulation on Framework Programmes 2014-2027 (February 2023)