

CERIC's contribution to the EU's strategic agendas- Developing dedicated services in the field of Energy storage

Introduction

Research infrastructures of European interest (RIs) are rightfully considered one of the most successful achievements of the European Research Area to date. Over the past 18 years, the field has been developed in the frame of the European Strategy Forum on Research Infrastructures (ESFRI). In close partnership with the national governments and the European Commission, ESFRI has, through its roadmapping process, established over 50 European Research Infrastructures, mobilising investments of approximately €20 billion across the EU.¹ The approach has been based on national RI roadmaps developed with a degree of coordination in almost all of the EU member states, which results in strengthening of the joint activities and pooling of resources across EU. A marked success was also the adoption of an ERIC regulation², which facilitates the establishment and operation of Research Infrastructures with European interest.

Despite the success, the field of RIs faces many challenges, which ESFRI addressed in its recently published White paper.¹ Among others, this paper emphasizes the need to enhance the role of Research Infrastructures as truly strategic investments across borders and different sectoral domains, contributing to European strategic agendas and enabling European research and innovation to address pressing and complex societal challenges. To this end, 'the RIs are invited to include outreach to wider policy objectives as part of their strategic approach and to exploit their potential for international cooperation. Sectoral research agendas should be considered for formulating RI missions and objectives, e.g. in relation to the UN SDGs.'

CERIC's contribution to the EU's strategic agendas

CERIC-ERIC is a multi-sited infrastructure, with facilities in 8 countries, enabling characterisation and modification of a broad field of materials, from Life Sciences, Nanoscience and Nanotechnology, to Cultural Heritage, Environment and Materials Sciences. According to its Statutes, CERIC's multiple objectives are ambitious. It should contribute to scientific excellence, education & training, collaboration with industry,

¹ ESFRI White Paper, 2020, <https://www.esfri.eu/esfri-white-paper>

² COUNCIL REGULATION (EC) No 723/2009 of 25 June 2009

to the integration of national capabilities, and to the development of the European Research Area. Since its establishment in mid-2014, policy makers have added additional objectives to RIs in general, such as the open access to the data that they are producing and the most recent one is that of contributing to the EU's strategic agendas.

RIs are certainly capable of providing solutions to pressing societal challenges. This is clearly demonstrated during the current pandemic, with a number of RIs setting up dedicated COVID-19 services within weeks,^{3,4} with several ones providing continuous service to the users throughout the pandemic.⁵

It could be claimed that the RIs have always contributed to the solutions to societal challenges, in the fields of energy, environment, health, cultural heritage, to name a few. Yet, the call of ESFRI for an increased focus on EU strategic agendas demonstrates that the message is not yet getting across. RIs need to respond collectively and more strategically. Business as usual will politically marginalize them, and this would negatively impact, also financially. The approach of CERIC is therefore to deliver on the priorities, which RI funders put in front of them, including the focus on EU's strategic agendas.

CERIC's contribution to the EU Green Deal – focus on energy storage

CERIC's current facilities are rather general in nature, supporting the studies of many different materials, from the domains of health to energy. In order to introduce some focus areas, the EU's priorities were reviewed,⁶ as well as the current RI landscape and CERIC's current strengths. Based on this, CERIC's general Assembly has selected two fields, energy and life science, and proposed a pilot activity in the field of batteries, to be followed by the fuel cells.

The pilot activity ticked many of the requirements. They will contribute to the EU climate goals, addressed through the Energy and climate plans, to the EU green Deal, potentially also to the Mission on 100 carbon neutral cities. Excellence is already present in this topic within the current offer of CERIC. 13% of CERIC's publications are among top 10% cited ones in their field, while a third of these are in the field of energy. To this end, CERIC has contracted a group of experts to advice on how to optimize its offer and improve its service to the battery research community. In its report,⁷ the experts review the current offer of CERIC

³ <https://www.esfri.eu/covid-19>

⁴ <https://erf-aisbl.eu/research-infrastructures-offer-for-research-on-covid-19/>

⁵ J. Kolar; A. Harrison; F. Gliksohn, [ERF's Review of Working Practices of Analytical Facilities During the Pandemic](#), 10.5281/zenodo.3813493

⁶ J. Kolar, Opinion – [Research infrastructures, Horizon Europe Missions and wider policy goals](#): doi: 10.5281/zenodo.3888222

⁷ B. Bozzini, A. Iadecola, L. Stievano, [Report of CERIC's Expert group on batteries](#), doi: 10.5281/zenodo.3888236

and propose improvements of the existing infrastructures and the addition of some new techniques and facilities. They also propose that CERIC establishes a Technical Battery Advisory Board, as a subgroup of its International Scientific and Technical Advisory Committee (ISTAC), which would also help in interactions between the users and the instrument scientists. Furthermore, it advised that CERIC dedicates significant efforts to the communication of its offer to the battery research community, by setting-up a section in CERIC's web site and a brochure. Two funding actions are also proposed. CERIC should continue with its PhD and post-doc scholarships, combining electrochemical and instrument skills, and it should support sample environment development at various instruments.

In parallel to these proposed activities, and taking into account the lessons learned in this pandemic, CERIC also invests considerable efforts to remotise its operations, e.g. to enable experiments to be performed on mailed-in samples, whenever possible. This activity will enable CERIC to continue providing services during the pandemic, but also a better service in the future. It will also decrease the carbon footprint of the operations, thus contributing also to the EU climate goals and the EU Green Deal.