

Research Project Description  
**European Synchrotron Radiation Facility (ESRF)**

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Research project: *Assessing Socio-Economic Impact of Research Infrastructures (RIs): Study of a Large-Scale Multinational Synchrotron Facility*

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**Statement of Purpose**

*The European Synchrotron Radiation Facility (ESRF), also known as the European Synchrotron, is a large-scale and user-based Research Infrastructure (RI). Since its establishment in 1988, ESRF has become an internationally-renowned centre for scientific excellence with a strong commitment to applied and industrial research. Today, it is the most powerful synchrotron light source worldwide providing research scientists from both academia and industry a unique tool to discover materials and living matter.*

As emphasized by the OECD (2019), the impact of RIs is not limited to fostering knowledge for the scientific community but also affecting their environment socially and economically. Although excellent scientific quality remains the primary goal for RIs, RI stakeholders, including researchers, policy-makers and the public, share an increasing interest in acknowledging the broader contribution of RIs to tackle societal challenges. In this regard, RIs act as focal points for continuous interaction between scientific, technological and socio-economic development (Reid *et al.*, 2015). Understanding the link between infrastructure investment and development outcomes has therefore become one of the most popular topics for debate in recent decades (Battistoni *et al.*, 2016; Scoble *et al.*, 2010; Snieska & Zykiene, 2009). Here, we are interested in exploring the “impact beyond science” at a multinational and multidisciplinary RI through assessing its socio-economic impact. The study intends to provide a theoretical framework for future recurring assessments at the ESRF and other synchrotron facilities or RIs. On the one hand, we focus on the quantifiable elements of socio-economic impact at the institutional level in reference to the social Cost-Benefit Analysis (CBA) approach (Florio, 2019). On the other hand, we investigate into specific

pathways in which impact is generated through the theoretical foundation of “productive interactions” (Spaapen & van Drooge, 2011). Overall, this study adopts the term “socio-economic impact” with the intention to blur the terminological boundary between social and economic impacts. Efforts will also be made to achieve a balance between quantitative and qualitative methodologies. Since we are aware that impact of research and RIs can be nuanced and multi-faceted, the scope of social and economic impacts may move beyond current thinking where necessary.

### **Research Questions**

- What is the impact of the ESRF regarding its broader societal value (including social, economic and environmental) and what is the potential framework for future impact assessments?
- What are the typical pathways where socio-economic impact is generated at a large-scale and user-based science facility?

### **Study Methodology**

The study observes the socio-economic impact of the ESRF through a two-step research design. It first follows the social CBA approach focusing particularly on the calculation of technological spillovers (e.g., commercialisation of research outputs and licensing) and knowledge outputs (e.g., publications/citations and patents). Data will be collected from interviews with key actors at the facility (e.g., team leaders from the Business Development Office and the User Office) as well as a database extracted from the Joint ILL-ESRF Library, the newly developed PUMA publication matching software and other existing resources. Based on the analytical results at the institutional level, the study will further select 3-4 representative cases where we investigate into impact pathways based on the theoretical foundation of “productive interactions”. Through stakeholder mapping exercises, surveys and semi-structured interviews, we plan to collect and analyse the data both qualitatively and quantitatively with the intention of tracking the impact generated at each step of stakeholder interactions. Ideally, each case study should provide insights into specific impact pathways and the triggers (e.g., type of interactions, type of research orientations, and configuration of socio-economic factors) that contribute to the impact generation processes.

## Reference

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