

An Instrument for Industrial Research

A Roadmap

Helmut Schober

Lund, 1 March 2024

ESS's mission is Excellence. As outlined in the guiding principles for Steady State Operations¹ *ESS, once in operation, must deliver over many decades an absolutely outstanding science programme using the world's most powerful neutron spallation source. In other words, ESS must aim at becoming a world leader in research using neutrons and an international hub for its scientific community. ESS will have delivered on this goal if it supports a vast and vibrant user community that has a large scientific impact by conducting experiments on the most pertinent scientific questions of the time. **It has to be stressed at this point that excellence of the scientific programme here explicitly is meant to include industrial research that by definition has to satisfy excellence criteria different from those traditionally used for academic research. This comprises in particular high-impact, high-throughput measurements.***

In the context of the transition into Steady State Operations that has gained strong momentum during the year 2023 and that will enter its implementation phase during 2024 it is important to reflect on how to pose the concrete foundations for securing this excellent industrial research at ESS. While this excellence can be obtained through various routes it is evident that the option of instruments fully dedicated to industry must be included into the reflection. To be able to do this in the most informed way we have to work out the requirements that such instruments must fulfill. These requirements must include technical specification as well an overall understanding of the business model. The later touches upon questions of service and access as well as financing. This is particularly important for ESS with its many member states and particular ERIC statute.

We are currently in the privileged situation that through the High-Level Industrial Forum (H-LIF) ESS could establish a close dialogue with major industrial stakeholders. During the recent H-LIF discussions the topic of a dedicated instrument has received very favorable resonance. I consider this a unique opportunity to proceed further and jointly work out concrete proposals, in this way making sure that the interests of industry as a customer are fully aligned with the offer that ESS can provide.

I, therefore, propose the following way forward:

- The H-LIF reiterates its support for exploring the possibility of a dedicated industrial instrument at ESS.
- ESS and H-LIF agree on the common interest of launching a pilot study.

¹ Steady State Operation, Guiding Principles for designing the ESS organisation, Helmut Schober, August 2022

- We identify an area where the specific ESS performance promises a particularly high impact for industry (e.g., structure of energy materials from the atomic to the macroscopic scale).
- We identify an H-LIF member ready to lead a consortium of interested partners.
- ESS and the consortium launch jointly a pilot-project.
 - The first stage of the project consists in elaborating a study that produces:
 - One or several concrete proposals for an industrial instrument. The proposals must be sufficiently detailed to allow judging its performance and evaluating its cost.
 - The corresponding Use Case. It must be considered impactful from the perspective of the industrial consortium and satisfy specific excellence criteria like the enhancement of competitiveness.
 - The corresponding business case. This must take into consideration the financial model but equally the integration into the ESS organization.
 - The operational model. This is not limited to the access model but must treat all other operational aspects including the career path for the staff involved in running the instruments.
 - The project must be aligned with the ESS timeline of the transition to Steady State Operations. For maximum impact this requires a rapid start and fast execution of the project.
 - The staff performing the study must be fully integrated into the industrial consortium as well as into the ESS to assure full ownership by both parties.
 - Financing for the study should be obtained through the consortium. An alternative route is through VR.
- The ESS reports regularly about the study to its governance bodies.
- Based on the outcome of the study and the acceptance received by the ESS governance bodies the consortium and ESS decide jointly on the next steps.
- No further-going obligations are contracted neither by the consortium nor by the ESS.