



CERN thoughts on lessons learnt on SEI for ERIC Forum

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Lessons Learned (1/2)

- 1. It's really hard. It does not mean the same to everyone, to the person in the street, a CERN user, a journalist or a politician. The targets and perspectives and indeed timeline vary tremendously.**
- 2. Some researchers are very passionate about SEI. Others are under resource and schedule pressures to achieve their specific goals and as such have less priority for SEI.**
- 3. It is really valuable to consider why research is being undertaken. In CERN we have, for example, research into superconductivity, which is needed for our magnets in our Large Hadron Collider. So, the research has a relatively clear use case. This is different from blue sky research. Both are valid but it is worth considering the classification without over-restricting the research.**
- 4. Related to this, it is interesting to assess, and in some cases even select, research projects against an overall strategy and SEI is key. Financial? Environmental etc.**

Lessons Learned (2/2)

- 5. The competition for funding is relevant. CERN is a good name and a leader in its field but even so an assessment of credible SEI is a key factor, whether that be internally, EC under Horizon Europe etc. The assessment of EC is a real learning opportunity!**
- 6. There is a push and a pull. CERN can share its technologies and reach out to society, but many of the best ideas have come from the outside where specialists in another field, e.g. cancer therapy, so finding the balance between push and pull is key.**
- 7. We are currently looking at using our superconductivity in zero emission aircraft. Not at all foreseen in the research use case!**
- 8. Pride and humility. Assess where we can add value and where not. Use the resources intelligently. They are the butter not the bread. Consider scalability and value.**
- 9. This is also really important to avoid the positive cognitive bias by only talking to our user community. Going forward, we are seriously looking at independent assessments not just as marketing but also to guide our road-map.**

Different assessments carried out over the years and reports

- 1. Some studies:
 - a. The study on the TT spill-over from CERN's procurement activities (2003)
 - b. The OECD study of the impact of CERN on society (2014)
 - c. The Cost-benefit-analysis of the LHC, carried out by the University of Milano (2015)
 - d. PhD thesis on the socio-economic impact of big science, carried out at KT (2018)
- 2. Ongoing study for the Future Circular Collider is critical to the future of CERN. It is not enough to demonstrate the pure science benefits, but an holistic view across a whole range of issues including:
 - a. Financial ROI – contracts and spin off jobs
 - b. Environmental impacts
 - c. Technology development opportunities (for MS/Europe)

Current impact indicators being used

- In procurements, we assess our expenditure in coefficients of the return to each member states industry in an annual procurement report. This is valuable, but also holds dangers. Member States can become obsessed by their coefficient and lose focus from all other benefits.
- Annual KT reports showing detailed impacts
- Amount of training. Number of patents and citations.
- What happens to CERN alumni? Diversity (gender, sexuality)
- Environmental impact report, especially in terms of CO2. Being taken forward into additional indicators on our supply chain
- Number of proposals to HE and their success rate. Our success remains high, but the first year saw a significant reduction in the number of proposals submitted (58->35). This is due to a combination of improved focus and workload challenges across the Lab.