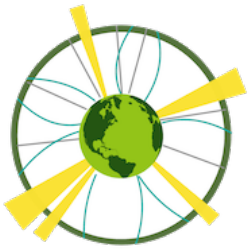

Contribution ID: **85** Type: **5 minute 'flash' talk**

FlexRICAN (Flexibility in research infrastructures for global carbon neutrality)

Monday 12 May 2025 19:40 (5 minutes)

FlexRICAN (Flexibility in research infrastructures for global carbon neutrality) is a cooperation among three major research infrastructures, each with distinct energy demands i.e., the European Spallation Source ERIC (ESS) in Sweden, the Extreme Light Infrastructure ERIC (ELI), with two running facilities (Czech Republic and Hungary) and the European Magnetic Field Laboratory AISBL (EMFL), with facilities in Grenoble and Nijmegen for DC fields and Dresden and Toulouse for pulsed fields (CNRS, RU, HZDR).

By combining their expertise, the participating research infrastructures (RIs) and industry partners will work to optimize both current and future energy projects. The goal is to showcase how RIs, as major energy consumers, can play a strategic role in advancing energy efficiency. This includes enhancing energy flexibility to support the European power grid and leveraging Waste Heat Recovery solutions to contribute to local heating networks. This seminar will focus on ESS in three main areas:

1- Renewable energy sources
2- Energy storage
3- Waste heat recovery

An analysis is being done on how renewable energy (RE) generation technologies can be implemented at ESS and how much power can be generated by different multi-energy configurations.

The goal is to develop modelling tools that predict and optimize the performance of RE systems (solar, wind, storage, etc.) for the specific conditions of ESS, or any given RI. Alongside these tools, further improvement of current technologies is aimed for; for example, a prototype PV panel will be designed to study how the cooling of solar panels could improve their performance.
These infrastructures are intensive energy consumers, generating a considerable amount of heat per year. Particularly at ESS, a good portion of this waste heat is recovered and transferred to be used in the district heating system. Two main topics are of interest regarding waste heat at ESS. First, the possibility of increasing the working temperature of the klystrons'collectors is being investigated. RF systems, and particularly the klystrons are among the top energy consumers at ESS as they are key parts of the Linac. The possibility of increasing the temperature of the cooling water exiting the collectors will provide a higher grade waste heat. However, the impact of such modification on the lifetime of the devices should be investigated as well.

Second, intermittency is a major issue when it comes to waste heat recovery and ESS is not an exemption. This issue is more serious on hot days in summer when there is less need for heating residential areas and therefore the district heating system will have problems with accepting all the waste heat ESS offers them. Therefore, an investigation is being conducted into the potential solutions to either store or consume the excess waste heat.

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Session Classification: Flash Talks