

GreenLab Research Missions

GreenLab's research initiatives are initiated through mission-driven challenges. The guiding missions for research in GreenLab are:

- Developing the **design principles for curated eco-industrial clusters** for the future of Green Industry
- Operating an eco-industrial cluster with the optimised matching of **RE fluctuations, demand-side flexibility and infrastructure storage and conversion investments**, as well as **minimised waste** on all other resource streams in the cluster
- Demonstrating the **value of sector coupling** and leading the way with scalable initiatives to bring value to the green transition of industries at a national and international level

Challenges June 2022

The following challenges are to be addressed in the open call:

Challenge A: From meta-studies of curated designs of eco-industrial clusters to actionable decision tools for cluster design

- At GreenLab, we see circular economy as one of the fundamental and necessary shifts in industry to enable a green transition in society. Eco-industrial clusters and industrial symbiosis are apparent ways to facilitate such shifts in economy and production.
- Scientific meta-studies of industrial clusters and industrial symbiosis outline some centrally governed cluster design challenges from "greenfield". However, there is a lack of concrete, actionable guidelines drawing upon such scientific studies.
- With this challenge, we invite a sociologically oriented study of mechanisms and incentives for cluster collaborations where guidelines and pitfalls from previous initiatives are identified.

Challenge B: Customer segmentation tool through sustainability preferences.

Mapping the trade-off between sustainability and cost

- At GreenLab, the incentive for industries to become site partners is often a green choice. However, we also see a need for an increased understanding of the spectrum of industry

operation from "all green" to "strict profit" focus. Most companies and potential site partners will be somewhere between the extremes.

- With this challenge, we invite a value stream mapping at the cluster level, which can foster a data-based discussion of customer categories concerning sustainability vs profit/cost. The mapping tool should facilitate coupling between customer preferences and overall cluster/park sustainability gains.

Challenge C: Design guide for active power distribution networks in industrial clusters with large pro-sumers

- At GreenLab, a mix of large energy consumers and green energy production constitute a novel setting where standard distribution networks may be challenged.
- The network topology and enabled service features should be reconsidered for such industrial clusters enabling both flexible operation and balance between availability and buffering and aggregated network services to the external DSO/TSO.
- With this challenge, we invite ideation and co-creation to design the optimal internal power network. The network design should both be optimised for operation as well as be an interesting test and demonstration facility for large scale power research

Challenge X: Open Challenge – Your ideas are welcome

- At GreenLab, we continuously identify new challenges and see the research activities targeting the challenges as steppingstones on the mission journey. This is our way of doing mission-driven research.
- Our ideas for new challenges are almost always based on dialogues with partners, researchers and other guests at GreenLab. We also welcome ideas falling outside the existing challenges. If an idea is well-justified and supports our missions, we may choose

to initiate a research project directly from the idea, or we may otherwise define a new challenge based on the idea for one of the next calls for project proposals

