Decentralised Energy Systems WG

Strategic Roadmap

WG Chairs: Enrico Bianchi, Peter Breuhaus

ETN Secretariat: Simon Gianordoli

ETN's new Decentralised Energy Systems Working Group brings together stakeholders of the value chain for decentralised energy solutions integrating micro and small gas turbines, with the objective to accelerate the development of cost-efficient, flexible and reliable technology system solutions in line with the market needs.

The Working Group aims to explore market opportunities and solutions, and review the technology readiness level of individual components, the gas turbine system and its integration into decentralised and multi-vector sustainable energy systems, as well as its interfaces and interaction with other system components.

The scope of the Working Group is to identify and assess promising decentralised energy systems applications where gas turbines may be technically and commercially integrated to provide low-carbon and carbon-free back-up and storage solutions. As stated at the ETN's High-Level User Meeting in October 2021, a portfolio of solutions should be developed for different markets and regional conditions, as one solution will not fit all. The technical and economic feasibility of the integration (advanced control systems, energy management systems) of these solutions also needs to be reviewed. In coherence with ETN Vision, as the penetration and use of intermittent Renewable Energies Solutions (RES) will continue to grow in the coming years and decades, gas turbines provide a suitable and efficient solution in ensuring security of supply, supporting peak demands levelling production and to . One of the key challenges will be provide seasonal energy storage solutions and overcome RES intermittency.

The Decentralised Energy Systems Working Group has a broad understanding of those new energy systems and will work with a benchmarking approach by assessing the feasibility and relevance of energy applications.

Decentralised energy solutions cases could be selected based on several criteria:

- Energy technological needs: storage, backups, fuel flexibility, integration with RES..
- Geographical areas: islands, remote areas, urban centres..
- Energy applications: energy intensive industries, hospitals, commercial & residential buildings, ports, transportation/mobility (e-charging stations) etc..

Those cases should be submitted to screening criteria defined by the Members to demonstrate their technical and commercial pertinence.

The review and assessment of these promising applications will increase knowledge and understanding of decentralised energy systems and the requirements gas turbines have to

meet to be integrated in such systems. Therefore, the Working Group would work as a hub by exploring new opportunities for the turbomachinery sector in a changing energy landscape.

Suggested process going forward:

1. Identify suitable categories and populate with promising integrated GT based solutions
2. Review state-of-the-art of identified solutions from a technical perspective (TRL-level), verify if there are any performed feasibility studies or ongoing-projects
3. Identify potential barriers from a regulatory perspective (ongoing projects)