LITHUANIAN ENERGY INSTITUTE

ADMISSION TO PHD STUDIES FOR THE YEAR 2025

DOCTORAL RESEARCH TOPIC:

Virtual power grid management and efficiency study

RESEARCH FIELD:

Energetics and Power Engineering (T 006)

BRIEF DESCRIPTION OF RESEARCH TOPIC:

The rapid development of renewable energy sources requires the efficient development of electricity transmission networks and the search for “out-of-the-box” solutions to ensure the required network capacity, reliability and stability at minimum cost/investment.

The aim of this thesis is to develop a virtual power transmission network concept that includes the management of energy storage systems, customer loads and generation in order to transmit the expected power flows, avoiding line capacity constraints and eliminating possible power imbalances.

Tasks:

- to develop the concept of a virtual electricity grid.
- to develop control algorithms for the virtual power grid. The work would include the development of artificial intelligence/optimisation algorithms to ensure efficient operation of the virtual power grid;
- to develop new services/market products for the efficient operation of the virtual grid.
- investigate the impact of the virtual power grid on the Lithuanian electricity system using the developed stability and reliability assessment methodologies.

During the dissertation (PhD thesis) preparation, it is expected to prepare at least two scientific articles in high-level scientific journals and to propose to the Lithuanian Transmission System Operator (Litgrid, AB) to implement the proposed concept of a virtual power transmission network in practice/real network. It is expected that the dissertation will provide a significant contribution to further research (including project proposals for the European Horizon Programme) and pave a way to new doctoral works.

SCIENTIFIC SUPERVISOR:

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