



Transnational Cloud for Interconnection of Demonstration Facilities for Smart Grid Lab Research & Development

Development and deployment of smart grid solutions is a key factor for us to meet the challenges the future power system is facing.

A cooperation between Swedish, Norwegian, Swiss, and Latvian partners with the goal to provide recommendations and strategies for the future power grid to facilitate larger amount of intermittent renewable generation together with less nuclear production while providing a secure and reliable electrical power supply.

Research Areas

Three highly complementary research areas provide a holistic view of the challenges of the future grid:

System stability

Stability is a basic prerequisite to operate the power system. There is a need to develop new solutions and methods to maintain a stable and secure operation of a power grid which is utilised in an increased and altered manner.

Ancillary services & energy management

As new components and systems are integrated in the power grid, there are new opportunities to support the grid through novel ancillary service solutions and strategies for energy management and market concepts.

Converter interoperability

The proliferation of power electronics in the grid is an enabler for higher flexibility. This increases the requirements on compatibility and interoperability between the various converters in hybrid AC/DC grids.

Approach

The project intends to provide an area for increased transnational cooperation and improved R&D solutions through a three-level interconnection between the Smart Grid labs of the consortium. Thus, the project will: broaden the research scope, test and validate applications in different environments, and provide solutions for a wider range of equipment and scenarios

First results

- I. Oleinikova, A. Mutule, A. Obushevs, N. Antoskovs: "Smart Grid Development: Multinational Demo Project Analysis", Latvian Journal of Physics and Technical Sciences, 2016, No 6, P.3-11.
- F. R. Segundo Sevilla, P. Korba, K. Uhlen, E. Hillberg, G. Lindahl, W. Sattinger: "Evaluation of the ENTSO-E Initial Dynamic Model of Continental Europe Subject to Parameter Variations", IEEE Conference on Innovative Smart Grid Technologies (ISGT), Washington, April 2017
- S. Sanchez, G. Bergna, E. Tedeschi: "Tuning of Control Loops for Grid-Connected Modular Multilevel Converters under a Simplified Port Representation for Large System Studies", IEEE International Conference on Ecological Vehicles & Renewable Energies (EVER), April 2017
- M. A. Bahmani: "Design Considerations of Medium-Frequency Power Transformers in HVDC Applications", IEEE International Conference on Ecological Vehicles & Renewable Energies (EVER), April 2017
- E. Hillberg, G. Lindahl, G. Pinares, F.R. Segundo Sevilla, P. Korba, K. Uhlen, W. Sattinger: "Frequency stability assessment of decreased conventional production in the Continental European power system ", Cigré Symposium Dublin, May 2017

The CloudGrid project started in March 2016 and continues until March 2019. Total budget is 2.3M€.
For further info: www.stri.se/cloudgrid

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