

April 27, 2017 at 4 pm

402 room, Building 3, Nobel Street, Skolkovo Innovation Center

Skoltech

Skolkovo Institute of Science and Technology



Lecturer:

Professor Phil Taylor,
Director of the EPSRC
National Centre for Energy
Systems Integration (CESI),
Siemens Professor of
Energy Systems



FREQUENCY STABILITY OF FUTURE ELECTRICITY SYSTEMS WITH HIGH LEVELS OF RENEWABLE ENERGY

ABSTRACT:

Energy Storage Systems (ESSs) are expected to play a significant role in regulating the frequency of future electric power systems. Increased penetration of renewable generation, and reduction in the inertia provided by large synchronous generators, are likely to increase the severity and regularity of frequency events in interconnected power systems. By supplying or absorbing power in response to deviations from the nominal frequency and imbalances between supply and demand, the rapid response of ESSs will provide a form of stability which cannot be matched by conventional network assets. However, the increased complexity of ESS operational requirements and design specifications introduces challenges when it comes to the realisation of their full potential through existing frequency response service markets: new service markets will need to be designed to take advantage of the capabilities of ESSs.

In this Seminar Professor Taylor will provide new methods of analysing and assessing the performance of ESS within existing service frameworks, using real-time network simulation and power hardware in the loop, to introduce improvements in existing services and potentially create new ones. He will describe novel statistical techniques to quantify the design and operational requirements of ESSs providing frequency regulation services. He will then describe the deployment of these new techniques on an illustrative case using high-resolution frequency data from the Great Britain transmission system.

BIOGRAPHY:

Professor Phil Taylor is Director of the EPSRC National Centre for Energy Systems Integration (CESI), Siemens Professor of Energy Systems. He is an internationally leading researcher and industrial expert in energy systems, electrical distribution networks, smart grids and energy storage integration and control.

Electrical energy storage is central to the world's energy future. It is vital to decarbonisation of the energy network, increases energy security and delivers energy user savings. Phil's research team is leading large-scale energy storage demonstration projects throughout the UK. He is a leading researcher on the Energy Storage for Low Carbon Grids project funded by the EPSRC that is working with multiple academic and industrial partners. The project aims to develop an integrated, cost-effective approach to deploying energy storage technology.

Phil and his research team are behind the smart grid lab in collaboration with Siemens, and energy storage test bed facility at NU. Both will be located at Science Central. NU researchers at these unique facilities are working with industry to pave the way for the UK's future as an international leader in energy storage. Phil works regularly with energy suppliers and distributors in the UK on the use of energy storage for power quality improvement in distribution networks.

If you have any questions or require further information, please contact **Victoria Godunova** at v.godunova@skoltech.ru
Participation in the workshop is open for all interested staff and guests.

LOOKING FORWARD TO SEEING YOU!