

S4: Smart computing applications on power and energy systems

Session organizers

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Chapter

Session Summary:

Nowadays, smart computings have been utilized to enhance the applications of many conventional and modern energy resources, and employed them via advance signal processing tools and models to solve common issues for energy production, generation, and managment. Oil, coal, and natural gas-based energy production and consumption systems are being replaced by renewable energy sources, such as solar and wind, in the global energy market, Although a worldwide energy transition is under way, more interventions are needed to decrease greenhouse gas emissions and minimize the effects of climate change. Decarbonizing the energy system requires immediate global action.

Additional flexibility is needed for the energy and power systems in order to integrate considerable quantities of intermittent renewable energy sources, such as wind and solar PV. In that regard, flexible generation from dispatchable generating units, demand response, market coupling, improved transmission and distribution systems, additional storage capacities, including the electrification of the transportation sector, are all extremely important for increasing system flexibility. At the same time, when combined or not with power systems planning models, optimization-based modeling tools based on sectoral approaches, dispatch models, such as economic dispatch and detailed unit commitment models, can provide a strong foundation for examining the short-term dynamics, the mid-term uncertainties, and the long-term difficulties associated with the decarbonization of the energy system. The Topics covered by this particular session include but are not limited to:



- Intelligent methods applied to power system studies
- Load forecasting
- Renewable energy forecasting
- Power and energy optimization
- Energy systems planning and scheduling
- Unit commitment and Economic dispatch
- Power system stability
- demand response
- Smart grids
- Energy management
- Microgrid and virtual power plant;
- Harmonics/voltage power quality;
- Power system resiliency.

Submission:

In order to submit to this session, please write “S4” as a prefix to your manuscript name. for example, if you have your file name as “UAVmobility.pdf”, the submitted file name should be “S4-UAVmobility.pdf.”

Template: Template ([Word](#))(6 pages max , 2 more pages with extra fees) ([Latex](#))

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