Renewable Energy Integration - Technological and Market Design Challenges

A PSERC Future Grid Initiative Progress Report

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PSERC Public Webinar
Tuesday, February 19, 2013
2-3 PM Eastern Time (11 AM-Noon Pacific Time)
Q&A until 3:15 PM Eastern

Description: The PSERC Future Grid Initiative is a DOE-funded project entitled “The Future Grid to Enable Sustainable Energy Systems” to investigate the requirements of an electric grid with high penetrations of sustainable energy systems and heavy reliance on cyber systems for sensing and communication. This webinar will provide an overview of the accomplishments of work done in the thrust area “Renewable Energy Integration: Technological and Market Design Challenges” on the following tasks:

- **Direct and Telemetric Coupling of Renewable Energy Resources with Flexible Loads:** (1) To design a new unit commitment scheduling model representing operation of day-ahead and real-time electricity markets with deferrable load (such as vehicle storage) and with uncertain prices, wind power production, load, and outages of generators and transmission lines; (2) to use that model to study operating cost and reserve requirement savings with deferrable loads; and (3) to devise a contractual basis for integrating deferrable loads efficiently.

- **Mitigating Renewables Intermittency Through Non-Disruptive Distributed Load Control:** For demand-side flexibility to support variable renewable electricity generation, (1) to develop and assess the potential of large-scale modeling strategies for aggregated load state estimation; (2) to develop novel control strategies that weigh the cost of control at the local level against benefits at the system level; and (3) to develop strategies to evaluate the end-use impact of the control actions, and use these impacts to understand the cost to recruit customers into this type of program.

- **Probabilistic Simulation Methodology for Evaluating the Impact of Renewables Intermittency on Operation and Planning:** To develop a comprehensive simulation methodology to quantify the economic and reliability impacts on overall grid performance and operation of storage applications in systems with high penetrations of variable wind and solar power generation resources.

- **Planning and Market Design for Using Dispatchable Loads to Meet Renewable Portfolio Standards and Emissions Reduction Targets:** 1) To develop a unifying framework to characterize different types of dispatchable loads (e.g., electric vehicles and HVAC systems with
thermal storage or on-demand temperature management; 2) to determine the engineering and economic feasibility of aggregating dispatchable loads to provide systems services (including frequency response, frequency regulation, load/generation following); and 3) to design a market that provides the correct incentives for managing the systems services provided by energy aggregators.

More information about the Future Grid Initiative is available on the PSERC website.

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Registration for Webinar Participation: None required. There is no charge for participating!

Participation by Webinar: There are several options for participating.
- Recommended option: We will be using the Adobe Connect 9 webinar platform. You will be able to watch the presentation slides on your computer from the designated site http://asu.adobeconnect.com/pserc/ and listen to the webinar through your computer’s speakers or headphones. Click here for the connection details and instructions for testing your connection. If you cannot hear the presenter, check to make sure your speaker is not muted in Adobe Connect. It may also be possible to use the app “Adobe Connect™ Mobile” to participate via smartphone or tablet.
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Asking Questions During the Webinar: You are invited to ask questions or make comments during the webinar using the Adobe Connect webconferencing platform. Just enter your question into the Q&A box.

Professional Development Hour Certification: PDH certification is available for PSERC members (only). Send an email requesting PDH certification to pserc@asu.edu with the subject “PDH”. Include the name and title of each participant.

Assistance: If you have any questions, please call 480-965-1643 or email pserc@asu.edu.