



Power Systems Engineering Research Center

Analyzing the System Costs of Wind Variability

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PSERC Public Tele-Seminar

October 6, 2009

2:00-3:00 p.m. Eastern Time (11:00-12:00 p.m. Pacific)

Description:

Wind power forecast uncertainty raises concerns of the impact of wind power on power system and electricity market operations. This research project uses an optimal power flow (OPF) model in a Monte Carlo Simulation (MCS) framework to estimate the cost impacts from the uncertainty in windfarm output. Using various regional load levels and assumptions on the costs for providing balancing energy, the results from the OPF and MCS analysis show that wind power forecast uncertainty, combined with load forecast uncertainty, can increase production cost for the 39-bus test system up to 350 times, though for most cases the forecast uncertainty does not introduce any significant changes from the base cases. The real and reactive power losses are shown to be higher for scenarios with low wind–high load and high wind–low load as compared to the moderate wind–load cases. The results also show minimal voltage violations across the test system.

Biography: **Judy Cardell** is an associate professor in the Picker Engineering Program and the Department of Computer Science at Smith College. She is a PSERC adjunct researcher. Her research interests include electricity market design and the integration of distributed resources into power system and market operations. Cardell received B.S.E.E. and A.B. degrees from Cornell University in electrical engineering and government. She received M.S. and Ph.D. degrees in technology and policy, and Electrical Engineering and Computer Science from MIT. Previously she worked at FERC and as a consultant to the electric power industry.

Related PSERC webinars:

[Contributions of Climate Science to the Electric Power Industry: Forecasting with Lead Times of Hours to Decades](#) (09-04, March 3, 2009)

[Demand Response via Real-Time Pricing to Increase Use of Operational Wind Energy Generators](#) (08-07; May 6, 2008)

[Integration of Renewable Resources](#) (07-07; October 2, 2007)

Other related webinars from Leonardo Energy

[Demand Side Flexibility – The Future of Electricity Balancing](#) (March 15, 2007)

[Impact of Wind Power on Power System Operation](#) (February 17, 2006)

[Pricing Intermittency, Loop Flow, and Other Forms of Unscheduled Flows of Electricity](#) (February, 27, 2007)

Speaker Contact Information

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Participation by Webcast: You can participate in PSERC tele-seminars via webcast. Before the tele-seminar, [click here](#) and then on 10/6/09 when the status is "In Progress." Note that the web page at that address does not automatically refresh. The webcast will include the audio and the slides so you will not have to download the slides in advance. If you want to ask questions, you should register for participation by phone. The archived audio-slide production of the tele-seminar will be available for [webstreaming](#) after the tele-seminar.

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

Participation by Phone: Live audio will also be provided via a teleconference phone bridge. After registering, you will be sent connection information for the conference phone bridge. You will need to download the presentation slides in advance of tele-seminar. The presentation slides will be posted on October 6 on the [PSERC website](#).

Registration for Phone Participation: To indicate that your organization would like to have a phone access line, send an email to Theresa.Herr@asu.edu with the subject "Cardell Seminar". To use our limited phone bridge capacity efficiently, we ask that people within an organization participate together rather than calling in separately, if at all possible. Connection information will be sent before the tele-seminar. There is no charge for participating!

Professional Development Hour Certification: PDH certification is available for PSERC members (only). Send an email requesting PDH certification to Theresa.Herr@asu.edu with the subject "PDH" after the seminar. *Include the name and title of each participant.*

Assistance

If you have any questions, please contact Theresa Herr, PSERC's administrative assistant, at 480-965-1643 or Theresa.Herr@asu.edu. You can also contact Dennis Ray, PSERC Executive Director, at 608-265-3808 or djray@engr.wisc.edu.

PSERC's Tele-Seminar Coordinator

Shmuel Oren, University of California at Berkeley

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Shmuel welcomes feedback on the tele-seminars and suggestions for future ones.