



Power Systems Engineering Research Center

PSERC Public Tele-Seminar Series

Impact of Increased DFIG Wind Penetration on Power Systems and Markets

Market Mechanisms: February 23

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

Description: This tele-seminar series gives the results from a PSERC project ([Executive Summary](#) | [Full Report](#)) that examined the impact of increased penetration of doubly-fed induction generator (DFIG) wind generation on power system dynamic performance and hence reliability. Increased penetration of wind-based resources into the generation mix is expected to have a distinct impact on the functioning of power markets. As electricity markets gravitate towards a regime where renewables, such as wind power, are an integral part of a firm's generation mix, multiple questions persist in terms of how market mechanisms should evolve to contend with the challenges arising from uncertainty and intermittency. In this research, we developed a flexible methodology for modeling strategic behavior in markets where firms may have wind-based generation. Importantly, we introduce a risk-based mechanism that charges firms when their bids have a large exposure to risk. Our research effort concentrated on the developing a modeling framework that can accommodate a host of complexities, ranging from capturing uncertainty and risk preferences in the setting of a two-settlement forward-spot market.

We derive some insights using a 53-node model of the Belgian network. Here, we allow a set of generators, some with a significant proportion of wind assets, to compete in the forward and spot-market in the face of uncertainty. Our models provide several insights for market design. For instance, we observe that higher levels of risk-aversion lead to lower participation in the forward markets while higher level of wind penetration. This tele-seminar provides an overview of the research on market mechanisms for wind power integration.

Participation by Webcast: You can participate in PSERC tele-seminars via webcast. Before the tele-seminar, [click here](#) and then on the date of the tele-seminar when the program status is "Live." Note that the web page at that URL does not automatically refresh. The archived audio-slide production of the tele-seminar will be available for [webstreaming](#) after the tele-seminar. Slides will be posted on the PSERC website.

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

Webcast Technical Issues:

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Assistance: If you need assistance before or during the webinar, please contact Theresa Herr, PSERC's administrative specialist, at 480-965-1643 or Theresa.Herr@asu.edu.

PSERC's Tele-Seminar Coordinator

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

Related PSERC tele-seminars

[Impact of Increased DFIG Wind Penetration on Power Systems and Markets: Voltage Response and Stability](#) (10-04, February 16, 2010)

[Impact of Increased DFIG Wind Penetration on Power Systems and Markets: Frequency Response and Stability](#) (10-03, February 9, 2010)

[Impact of Increased DFIG Wind Penetration on Power Systems and Markets: Small Signal and Transient Stability](#) (10-02, February 2, 2010)

[Integrating Wind Power Efficiently into Electricity Markets Poses New Regulatory Challenges.](#) (10-01, Jan. 19, 2010)

[Analyzing the System Costs of Wind Variability](#) (09-10, Oct. 6, 2009)

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