



Power Systems Engineering Research Center

Demand Response via Real-Time Pricing to Increase Use of Operational Wind Energy Generators

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Golden, CO, USA

Public Tele-seminar
Tuesday, May 6
2:00-3:00 Eastern Daylight Time

Description: Title XIII of the Energy Independence and Security Act of 2005 states that it is now U.S. policy to modernize the grid by creating a Smart Grid that, in part, will integrate distributed resources and incorporate demand response. Real-time pricing (RTP) is a means for demand response that could be enabled by a Smart Grid. This seminar is on a study of how RTP can make the use of wind energy more efficient in a power system.

One of the impediments to large-scale deployment of wind generation within power systems is its non-dispatchability, and variable and uncertain real-time energy output. Operating constraints on conventional generators (such as minimum generation points, forbidden zones, and ramping limits) as well as system constraints (such as power flow limits and ancillary service requirements) may force a system operator to curtail wind generation to ensure that the system can be operated securely. Furthermore, the pattern of wind availability and electricity demand may not allow wind generation to be fully utilized in all hours. Constraining output from operational wind energy generators raises costs and air emissions, and makes it more difficult to reach targets set by renewable portfolio standards.

In this seminar, I will discuss the use of RTP as a demand-response solution that could help operators make better use of wind resources. RTP can (1) help to smooth-out the diurnal load pattern to reduce the effects of binding unit operating constraints on wind utilization, (2) provide the incentive for demand to increase in response to the availability of wind generation with its zero variable energy cost, and (3) reduce transmission congestion by using locational prices to increase demand on the 'export side' of a transmission constraint. I will discuss a case study based on the ERCOT power system with different estimates of demand responsiveness to demonstrate the potential increase in the use of wind generation as a result of implementing RTP.

Biography: Ramteen Sioshansi is a postdoctoral researcher in the Strategic Energy Analysis and Applications Center at the National Renewable Energy Laboratory, Golden, CO. His research interests concern the design and analysis of market mechanisms for competitive electricity markets, and the integration of large-scale renewable energy systems into the existing energy infrastructure. His Ph.D. is in Industrial Engineering and Operations Research from the University of California at Berkeley.

Speaker Contact Information

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

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