



Power Systems Engineering Research Center

Quantifying Benefits of Demand Response and Look-ahead Dispatch in Systems with Variable Resources: ERCOT Case Study

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Description

In this talk we present the empirical study on the benefits of combining look-ahead dynamic dispatch with price responsive demands for integration of variable energy resources in Electric Reliability Council of Texas (ERCOT). Based on substation level demand response data and site-specific wind generation data from ERCOT, algorithms are developed to quantify (1) the price elasticity of demand for typical users, and (2) the economic and security benefits of look-ahead dispatch with price responsive loads. We also study the impact of time-coupled look-ahead dispatch on locational marginal prices. This work was supported by PSERC and was jointly done with Steve Puller, Texas A&M, Marija Ilic, Carnegie Mellon Univ., and Shmuel Oren, University of California, Berkeley.

Biography

Le Xie is an Assistant Professor in the Department of Electrical and Computer Engineering at Texas A&M University, College Station, Texas, where he is affiliated with the Electric Power and Power Electronic Group. He received his B.E. in Electrical Engineering from Tsinghua University, Beijing, China in 2004. He received Master of Science in Engineering Sciences from Harvard University in June 2005. He obtained his Ph.D. from Electric Energy Systems Group (EESG) in the Department of Electrical and Computer Engineering at Carnegie Mellon University in 2009. His industry experience includes an internship in 2006 at ISO-New England and an internship at Edison Mission Energy Marketing and Trading in 2007. His research interest includes modeling and control of large-scale complex systems, smart grid applications in support of variable energy integration, and electricity markets. Dr. Xie received National Science

Foundation *CAREER Award*, and the Oak Ridge Ralph E. *Powe Junior Faculty Enhancement Award*. His students and he won the Best Paper Awards in 2012 North American Power Symposium and 2012 IEEE SmartGridComm. He is an Editor of *IEEE Transactions on Smart Grid*, and the founding chair of IEEE PES Power System Analysis, Computing and Economics Committee Task Force on Big Data Analytics for Grid Operations. He also serves as the founding faculty advisor to Texas A&M Energy Club, a university-wide student-run organization focusing on energy.

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PSERC's Webinar Coordinator: Venkataramana Ajjarapu, Iowa State University, vajjarap@iastate.edu.

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