LOOK-AHEAD COORDINATION OF WIND ENERGY AND ELECTRIC VEHICLES: A MARKET-BASED APPROACH

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Abstract
In this talk we present market-based coordination of variable resources with storage systems such as aggregated Plug-in Hybrid Electric Vehicles (PHEVs). Starting from our recent work on model predictive scheduling of conventional generation, variable generation, and battery storage systems, we further develop a look-ahead multi-layered simulation platform which (1) takes into account of the transmission congestion; and (2) co-optimizes individual participants’ profits from both energy and regulation services markets. In contrast with today’s operation software, the proposed scheduling framework could improve the overall system efficiency while observing the transmission network constraints. We illustrate the improved operational efficiency in a modified IEEE 14-bus system.

Biography
Mr. Gu was born in Shanghai, China. He received the B.S. degree in electrical engineering in 2009 from Shanghai Jiao Tong University, Shanghai, China. He is currently pursuing Ph.D. degree in Electrical Engineering at Texas A&M University, under the supervision of Prof. Le Xie. His research interests include power system optimization, Vehicle to Grid technologies, renewable energy, power system analysis and voltage stability.