

New Challenges & Opportunities in Renewable Power Grids



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(Dr. Li's lab website: <https://rpplab.github.io/people/>)

Abstract

Electric power grid is the world's largest "machine" and the greatest engineering achievement of the 20th century. The technologies to properly manage traditional power systems with little variable renewable generation were very mature. However, due to the fast growth of wind power and solar power, the legacy power grids are shifting to the next-generation renewable power grids where new challenges arise. As a result, new opportunities also arise in the power engineering field. This talk will first introduce the basics of power systems, followed by an explanation on modern power system management ranging from long-term grid planning to short-term grid operations. Subsequently, this talk will cover the trends of wind power and solar power, and then present what their undesired features are. Last, this talk will briefly discuss what the potential new opportunities are and provide a few examples.

Speaker Biography

Dr. Xingpeng Li is currently an Assistant Professor in the Department of Electrical and Computer Engineering at the University of Houston. He previously worked for ISO New England and PJM Interconnection. Before joining the University of Houston, he was a Senior Application Engineer for the ABB Power Grid Division that is now Hitachi Energy. He received the Bachelor's degree in electrical engineering from Shandong University in 2010, and the master's degree in electrical engineering from Zhejiang University in 2013. He received the master's degree in industrial engineering and the Ph.D. in electrical engineering from Arizona State University in 2016 and 2017 respectively. Dr. Li received the Tier-1 Silver award and Tier-2 Silver award from U.S. Department of Energy for his two winning submissions to the Electricity Industry Technology and Practices Innovation Challenge prize competition in 2019. His research interests include power system operation and planning, grid integration of renewable generation and energy storage, and microgrid.