PSERC Power Systems Engineering Research Center

PSERC WEBINAR

Sequential Pricing of Electricity

Jacob Mays
Cornell University

This talk investigates the design and analysis of price formation in wholesale electricity markets given variability, uncertainty, non-convexity, and intertemporal operating constraints. The primary goal is to develop a framework to assess the many resource participation models, reserve product definitions, and enhanced pricing methods that have arisen in U.S. systems, especially in the context of growing contributions from wind, solar, and storage. Departing from the static models typically used for electricity auctions based on thermal resources, the analysis situates price formation within the sequential decision problem faced by system operators. This more complete description of the problem has several implications for the design and analysis of price formation policies. Since prices are derived from operational models, algorithmic choices in the design of policies for this problem influence the prices ultimately formed. In numerical tests, policy variants with comparable operational performance (within 3% in terms of total cost) lead to substantial differences in prices and resource remuneration. Storage is particularly affected, earning revenues ranging from 68% to 116% of the amount suggested as economically efficient by a benchmark approximated through stochastic programming.

FEBRUARY 14, 2024 | **1:00-2:00 P.M. ET**

LINK TO WEBINAR

(10:00-11:00 A.M. PT)

Jacob Mays is an Assistant Professor in the School of Civil and Environmental Engineering at Cornell University. His research focuses on applications of stochastic optimization and statistical learning in energy systems. Jacob holds an AB in chemistry and physics from Harvard University, an MEng in energy systems from the University of Wisconsin–Madison, and a PhD in industrial engineering and management sciences from Northwestern University.