PSERC Power Systems Engineering Research Center

PSERC WEBINAR

Coordinating Storage and Renewable Growth Under Uncertainty to Manage Grid Risk

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This presentation examines how coordinated planning of battery storage and renewable expansion can reduce curtailment, congestion, and reliability risks in renewable-dominant power systems under weather-driven uncertainty. It addresses two questions. First, using a spatially resolved, two-stage stochastic DC optimal power flow framework we optimize battery storage siting, sizing, and technology choice to minimize total system cost while respecting network constraints. Results from a realistic case study show that strategically sited storage can substantially improve system performance by reducing renewable curtailment and load shedding. Second, building on the same planning foundation, the risk-analysis component reframes curtailment as a distributional risk and evaluates how renewable siting decisions shape exposure to adverse curtailment outcomes under uncertainty.

MARCH 4, 2026 | **1:00-2:00 P.M. ET**

LINK TO WEBINAR

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

Elnaz is an Assistant Professor in the Department of Engineering Technology & Industrial Distribution and an affiliated faculty member in the Department of Electrical and Computer Engineering at Texas A&M University. Prior to joining Texas A&M, she was a Postdoctoral Research Fellow at Cornell University. She received her Ph.D. in Industrial and Operations Engineering and her M.S. in Statistics from the University of Michigan, Ann Arbor. Her research focuses on advanced analytics to model, optimize, and improve future power systems under uncertainty, with an emphasis on renewable-rich, electrified, decentralized, and interconnected networks. She has made significant contributions to power system risk analysis, recognized through best paper and poster awards from the Society for Risk Analysis. Her work has been supported by organizations including the Department of Energy and Power Systems Engineering Research Center.