



PSERC WEBINAR

Pricing Rolling-window Dispatch under Uncertainty: Dispatch-Following and Truthful-Bidding Incentives

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Rolling-window dispatch is widely adopted to provide ramping support in real-time electricity markets under demand and supply uncertainties. A standard pricing model is the multi-interval locational marginal pricing (LMP) based on short-term forecasts. When the forecasting horizon is finite and the forecast inaccurate, LMP requires out-of-the-market settlements to ensure that a generator cleared in the real-time market follows the operator's dispatch signal. Such uplifts result in price discrimination and strategic bidding incentives.

We show that the lack of dispatch-following incentives of LMP is generic to uniform pricing. In particular, under mild conditions, out-of-the-market uplifts are unavoidable, which makes uniform pricing fundamentally discriminative. The uplift payments also have an unintended consequence that a price-taking generator that typically bids with its marginal cost has the incentive to deviate from truthful bidding to gain additional profit from uplift payments. We further show that a simple generalization of LMP to a nonuniform setting eliminates the need for uplift payments and restores the truthful bidding behavior for price-taking generators under arbitrary forecasting errors.

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[LINK TO WEBINAR](#)

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Lang Tong is the Irwin and Joan Jacobs Professor in Engineering and the Cornell site director of the Power Systems Engineering Research Center (PSERC). His current research focuses on energy and power systems, smart grids, and the electrification of transportation systems. His expertise lies in the intersection of data analytics, machine learning, optimization, and market design. He received numerous publication awards from the IEEE Signal Processing, Communications, and Power and Energy System Societies.

Lang Tong received a B.E. degree from Tsinghua University and a Ph.D. degree from the University of Notre Dame. A Fellow of IEEE, he was the 2018 Fulbright Distinguished Chair in Alternative Energy.

