Trading Strategies for Distribution Company with Stochastic Distributed Energy Resources. - DTU Orbit (08/11/2017)

Trading Strategies for Distribution Company with Stochastic Distributed Energy Resources.

This paper proposes a methodology to address the trading strategies of a proactive distribution company (PDISCO) engaged in the transmission-level (TL) markets. A one-leader multi-follower bilevel model is presented to formulate the gaming framework between the PDISCO and markets. The lower-level (LL) problems include the TL day-ahead market and scenario-based real-time markets, respectively with the objectives of maximizing social welfare and minimizing operation cost. The upper-level (UL) problem is to maximize the PDISCO's prot across these markets. The PDISCO's strategic oers/bids interactively in uence the outcomes of each market. Since the LL problems are linear and convex, while the UL problem is non-linear and non-convex, an equivalent primal-dual approach is used to reformulate this bilevel model to a solvable mathematical program with equilibrium constraints (MPEC). The effectiveness of the proposed model is veried by case studies.

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