



Strategic Bidding of Retailers in Wholesale Markets: Continuous Intraday Markets and Hybrid Forecast Methods

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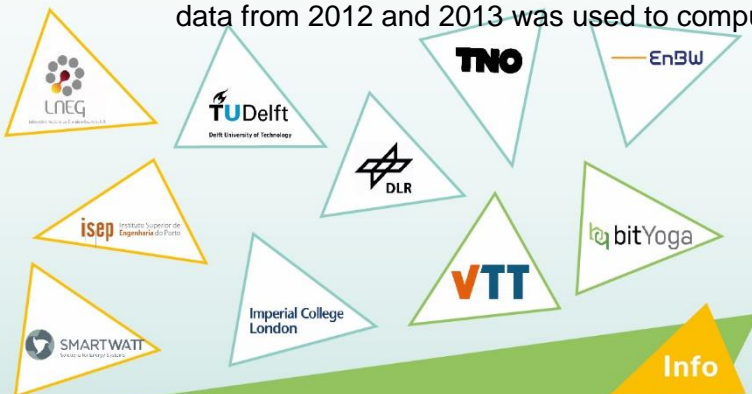
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Summary

This article is devoted to the agent model of Retailers, focusing on their strategic bidding process considering the following models: i) a risk management; ii) imbalance settlement; iii) trading strategies; iv) bilateral trading; v) hybrid forecasts. Specifically, the theoretical work presented in the paper includes a description of the retailer agent model, designed for bilateral, spot and continuous trading based on strategic bidding. Agent-based retailers are equipped with trading strategies, utility functions, a bilateral trading model that enables them to propose and negotiate different types of bilateral contracts, and a strategic bidding model to submit bids to spot and continuous wholesale markets. The strategic bidding process uses four different hybrid forecast methodologies: a historical hourly comparison of consumption based on days with similar meteorological conditions, a historical traditional behavior of each consumer, a short-run trend considering the typical consumption behavior of consumers and a short-run trend of the consumption tendency. The first methodology is used in the day-ahead forecasts. All methodologies are weighted and used in the bids submitted to spot intraday markets. The third methodology is used in the continuous intraday forecasts. The highlights comprise:

Highlights

- A model that manages the portfolios of retailers agents, using risk management and trading strategies;
- The development of a strategic bidding process that aims at satisfying the energy needs of customers, by submitting bids to wholesale markets with the goals of reducing the costs of their energy by reducing forecast errors, unbalances, and penalties;
- The practical work of the article includes a case study that tests the strategic bidding process and compares its results with regulated tariffs. The case study involves six retailers and 312 Portuguese medium voltage consumers. The consumption and the Iberian market of electricity data from 2012 and 2013 was used to compute the market results of retailers.



The TradeRES project will develop and test innovative electricity market designs that can meet society's needs of a (near) 100% renewable power system. The market design will be tested in a sophisticated simulation environment in which real-world characteristics such as actors' limited foresight into the future and risk aversion are included.



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