

Strategic bidding in secondary reserve markets

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Abstract— Electricity markets are based on several sequential energy and reserve trading mechanisms to constantly maintain the balance between generation and demand. During the last years, reserve markets are getting much importance all around the world with the increasing social awareness of the renewable energy benefits.

Additional reserve quantities and larger remunerations are being implemented by the regulators since this renewable energy is highly dependent on weather conditions uncertainties. Utilities are therefore demanding more and more powerful models to better optimize their reserve bidding curves to be sent to the system operators.

This paper describes a new methodology to obtain an optimized real bidding curve for the secondary (spinning) reserve market. The approach is based on the maximization of a company profit, assuming a set of residual demand curves scenarios for its competitors' representation, and considering the day-ahead market opportunity cost to build the reserve cost curve. The case study validates the main features of the proposed methodology by its application to the Spanish secondary reserve market. This methodology is being daily used by one of the most important electricity companies in Spain.

Index Terms— Ancillary services, bidding strategies, electricity markets, mixed integer programming, residual demand curve.

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