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Game-Theoretic Modeling of Electricity Markets in Central Europe

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Abstract: The paper deals with the methodology of computer modeling and simulation of complex markets with electricity and related products. The methodology is presented using a particular configuration of Central European markets with decentralized trading and international electricity transfers. The modeling approach is based on pure computer numerical solution in discrete state space determined by problems on which the modeled players are expected to decide—price offered for electricity supplied to various markets, breakdown of total power generation into individual commodities (yearly band, monthly band, spinning reserve) and setting bids in auctions for cross-border profiles. Similar approach to decision-making is adopted on the buyer's side. Buyers are expected to strive to contract power supplies in the way that is most advantageous for them. The generated state space is then analyzed using concepts of mathematical game theory. In this way, we obtain a prediction of probable decisions of modeled players in their market competition. Finally, we present a simplified power system forecast for Central Europe for year 2009.

JEL classification: C51, C53, C63, C72

Keywords: Prediction model, algorithmic game theory, modeling, electricity markets

RePEc: http://ideas.repec.org/a/fau/aucoz/au2010_032.html

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