

国家重点基础研究项目

基于通用博弈模型的电力市场均衡对比分析

李清清,周建中,莫莉,罗志猛,张勇传

华中科技大学 水电与数字化工程学院, 湖北省 武汉市 430074

摘要:

根据通用博弈模型研究发电商在制定竞价策略时是否考虑竞争对手行为对市场均衡的影响。通过建立日前市场发电商的通用博弈模型, 求解出市场出清结果, 继而推导发电商在不考虑和考虑竞争对手行为2种情况下的最优策略, 指出这2种情况下的市场均衡分别对应Cournot模型和供给函数模型的均衡结果, 证明了市场出清电价、发电商的上网电量和收益等出清结果对发电商策略参数的单调性, 从而确定发电商策略参数变化时各种市场出清结果的变化趋势, 并据此在成本对称和领导-跟随者2种常见成本结构下对不同情况下的市场均衡进行对比。算例验证了上述结论。

关键词:

Contrastive Analysis on Electricity Market Equilibrium Based on General Game Model

LI Qing-qing ,ZHOU Jian-zhong ,MO Li ,LUO Zhi-meng ,ZHANG Yong-chuan

College of Hydroelectric and Digitalization Engineering, Huazhong University of Science and Technology, Wuhan 430074, Hubei Province, China

Abstract:

Utilizing the general game model, it is researched whether the impact of competitors' bidding behavior on market equilibrium is taken into account or not during drafting bidding strategy of generation companies (gencos). By means of establishing general game model of gencos in day-ahead market, the market clearing result is solved; and then the optimal strategies of gencos are derived while two conditions that the competitors' behavior is taken into account or not, and it is pointed out that the market equilibrium under the two conditions corresponds to the equilibrium outcomes of Cournot model and supply function model, so the monotonicity of clearing results such as market clearing price, gencos' trading quantity of electricity and income to gencos' strategy parameters is proved; thus the variation trends of various market clearing outcomes under the variation of gencos' strategic parameters are determined, and accordingly the market equilibrium in different condition is compared under the symmetrical generation cost case and leader-follower case. Results of calculation example verify corresponding conclusions.

Keywords:

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通讯作者: 李清清

作者简介:

作者Email: kaiser_lee@163.com

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