Bargaining game based on psychology cost of electric vehicles and risk assessment of aggregator

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Abstract

As electric vehicles (EVs) begin to participate in the peak regulating auxiliary service market, it has become a major problem that how can price aggregators maximize the peak shaving capacity provided by EVs and maximize their own interests. This paper proposes a bargaining game pricing method based on the psychology cost of EVs and the risk assessment of aggregators. First of all, according to the impact of users' participation in peak shaving on the battery life of EVs, the impact of participation in peak shaving on users' original travel plans and time, and the impact of aggregator pricing on users' psychology, the comprehensive psychology cost of EV users is obtained. Then, based on the user's psychology cost and the law of gravitation, the evaluation scheme for the peak shaving capacity of EVs is obtained. On the basis of conditional value at risk (CVaR), the mixed CVaR is obtained by considering the behavior of users who may chase risks. Based on the mixed CVaR, the risk assessment of aggregators' participation in the peak regulating auxiliary service market is carried out. According to the above information, the aggregators and the EV teams are engaged in a bargaining game based on the peak shaving pricing problem, which is divided into complete information game and incomplete information game. Finally, the feasibility of the proposed method is verified by an example analysis.

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