

Electric End-User Consumer Profit Maximization: An Online Approach

Arman Alahyari

Abstract: The fast growth of communication technology within the concept of smart grids can provide data and control signals from/to all consumers in an online fashion. This could foster more participation for end-user customers. These types of customers do not have powerful prediction tools or large stored historical data. Besides, relevant data is not always known a priori while decisions need to be made fast within a very limited time. We propose an online constrained convex optimization framework for operating responsive end-user electrical customers in real-time. Within this online-decision-making framework, algorithms are proposed for two cases: no prediction data is available at the moment of decision-making, which resembles smaller consumers; and a limited number of forwarding time periods prediction of uncertain parameters being available. The simulation results exhibit the capability of the model to achieve considerable profits in an easy-to-implement procedure. A comprehensive numerical test cases are performed for comparison with existent alternative models.