

Sayyad Nojavan, Kazem Zare, Behnam Mohammadi-Ivatloo, 2017, Risk-based framework for supplying electricity from renewable generation-owning retailers to price-sensitive customers using information gap decision theory, *Electrical Power and Energy Systems*, 93: 156–170.

Abstract In this paper, selling price determination problem for an electricity retailer has been studied. In the proposed model, the selling price is determined under fixed pricing (FP), time-of-use pricing (TOU) and real-time pricing (RTP). It is shown that the selling price determination based on RTP by the retailer can lead to the higher expected profit. Furthermore, to exchange power between retailer and power market, the bidding and offering curves should be prepared to bid and offer to the day-ahead market. Therefore, this paper proposes an information gap decision theory (IGDT) for obtaining of optimal bidding and offering strategies of retailer. IGDT assesses the robustness and opportunity decisions of optimal bidding and offering strategies in the presence of market price uncertainty while retailer considers whether robustness decision (risk-averse) or opportunity decision (risk-taking). It is shown that risk-aversion and risk-taker influence the expected profit and optimal bidding and offering curves. Meanwhile, the scenario-based stochastic framework is used for uncertainty modeling of market prices, client group demand and variable climate condition containing temperature, irradiation and wind speed. To validate the proposed model, three case studies are used and the results are compared.

Keywords Electricity retailer; Information gap decision theory; Fixed pricing; Time-of-use pricing and real-time pricing.