Ali Mehdizadeh, Navid Taghizadegan, Javad Salehi, 2018, Risk-based energy management of renewable-based microgrid using information gap decision theory in the presence of peak load management, *Applied Energy,* 211: 617–630.

Abstract The operator of renewable-based microgrid (MG) tries to supply the local load with the lowest cost from the alternative energy sources containing upstream grid, micro-turbines (MTs), renewable energy sources (RESs) (photovoltaic (PV) systems and wind-turbines (WT)) and energy storage system (ESS). To purchase power from upstream grid, the optimal bidding curve of MG should be prepared to bid the market operator. Therefore, this paper proposes an information gap decision theory (IGDT) to obtain the bidding strategy of MG. IGDT includes the robustness and opportunity functions for upstream grid price uncertainty modeling. MG can consider the robustness decision (risk-averse) or the opportunity decision (risk-taking) under uncertainty environment. Also, the operator of MG uses the demand response program (DRP) which purpose is to reduce the energy procurement cost. Meanwhile, the proposed stochastic model considers the uncertainty modeling of local load and RESs output power by using a scenario stochastic model. To show the capability of proposed approach, two cases considering without and with DRP are studied. Beneficial results of DRP are utilized in case B, which the operation cost in case B is %4.6 less than case A.

Keywords Bidding strategy, Microgrid (MG), Renewable energy sources (RESs), Demand response program (DRP), Information gap decision theory (IGDT).