Danial Masihabadi, Mohsen Kalantar, Zahra Majd, Seyed Vahid Sabzpoosh Saravi, 2023, A novel information gap decision theory-based demand response scheduling for a smart residential community considering deep uncertainties, *IET Generation, Transmission & Distribution,* https://doi.org/10.1049/gtd2.12744.

Abstract Demand response programs (DRPs) have paved a meaningful role in the power supply–demand balance in a smart grid. Also, a residential community with the presence of renewable energy sources (RESs) and electric vehicles (EVs) provides a new way to tackle growing concerns about energy efficiency and environmental pollution. The inherent uncertainty of RESs generation and EVs behaviour leads to difficulty in the economic scheduling of the demand side. Different types of uncertainty modelling have been investigated, such as Monte Carlo (MC) simulation, fuzzy method, and robust optimization. They are faced with many scenarios and computational complexity. This paper uses the information gap decision theory (IGDT) method to study variations of uncertainty radius on residential community electricity costs. Therefore, to achieve an optimal strategy for scheduling the appliances considering the deep uncertainties of RESs and EVs, a novel IGDT-based demand response scheduling for a residential community is proposed. Impacts of different levels of uncertainties are studied. The simulation results depict the privileges of the proposed method when confronting deep uncertainties. By increasing the radius of the uncertainty of RES and the initial charge of EVs, energy consumption costs grew 20% and 2%, respectively, which indicates the system operator can manage the costs effectively.

\website\IGT\masihabadi-etal2023abs001.tex 28.1.2023