Ehsan Hooshmand and Abbas Rabiee, 2019, Robust model for optimal allocation of renewable energy sources, energy storage systems and demand response in distribution systems via information gap decision theory, *IET Generation, Transmission & Distribution*, vol. 13, #4. https://doi.org/10.1049/iet-gtd.2018.5671

Abstract Considering increasing distributed energy resources and responsive loads in smart grid paradigm, this study proposes a new approach for robust hourly energy scheduling of distribution systems at the presence of severe uncertain renewable energy sources (RES). Wind and photovoltaic power generations are considered as the RESs. The aim is to minimise the total energy procurement cost, while considering the participation of RESs, by their optimal allocation in the network. The inherent uncertainty of RESs is handled via information gap decision theory. One of the features of the proposed model is to consider the impact of demand response and energy storage system as the effective tools to reduce unintended costs due to uncertainty of RESs. Also, the proposed model handles the uncertainty of multiple RESs in a way that maximum tolerable uncertainty of RESs is achieved for a given worsening of total energy procurement cost. The proposed model is formulated as a mixed integer nonlinear optimisation problem and is implemented in general algebraic modelling system environment. The model is applied on the IEEE standard 33-bus radial test system, and the obtained results substantiate that the utilisation of ESS and DR can reduce the impact of RESs' uncertainty on the energy cost.