

## **Large-consumer energy procurement optimization using a hybrid IGDT-stochastic approach**

### **ABSTRACT**

The large electricity consumer (LEC) problem has been increasingly getting noticed from various viewpoints in recent years. Decreasing the total operation cost (TOC) of LEC with multi-energy procurement sources (MEPSs) is considered as a main objective for the decision-maker. So, to this end, in this paper, MEPSs contain pool market (PM), bilateral contracts (BCs), renewable energy sources (RESs), i.e., photovoltaic panels (PVs) and wind turbines (WTs), distributed generations (DGs), and also energy storage systems (ESSs). The flexible reducing expected cost of LEC, which is integrated into the presented model, is the demand response program (DRP). Also, to accommodate the uncertain nature of the output powers of RESs, demand, and electricity market price, a hybrid information-gap decision theory (IGDT)-stochastic approach is proposed in the current work. Finally, a case study is considered to apply the proposed mixed-integer linear programming (MILP) model and then investigate the presence of DRP in both risk-averse strategy (RAS) and risk-seeker strategy (RSS) for the LEC taken problem. Simulation results are obtained from CPLEX solver under GAMS optimization software indicate the potentiality and effectiveness of the introduced approach.