Stochastic multi-objective operational planning of smart distribution Systems in presence of electric vehicles in order to reduce operational cost and pollution considering demand response programs

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In this thesis, the optimal operation of diesel generators, fuel cells, wind turbines and solar arrays in an intelligent distribution network is considered. The main goal is to reduce operational cost and pollution the exploitation of fossil resources. In this regard, various optimization methods such as NSGAII and MOPSO have been used. In other words, the output power of the mentioned source is determined so as to reduce operational cost and pollution as much as is possible. It's also important to mention the presence of electric vehicles using discrete Markov chain in this study. In addition, the uncertainty of wind and solar generation and load are modeled by Mont Carlo and robust method. Furthermore, demand response technique in the forms of load shading and shifting has also been into consideration and results are presented. Simulation results show that, operational cost and pollution reduces considering demand response program and NSGAII is more capable than MOPSO. So, modeling all of the related uncertainty in this study is the superiority of this research.

Keywords : Smart Distribution Grid, Operational Cost, Pollution, Demand Response Program, NAGAII, MOPSO