

A Novel Multi-Objective Park and Ride Control Scheme Using Renewable Energy Sources: Cairo Case Study

Authors : Mohammed Elsayed Lotfy Elsayed Abouzeid, Tomonobu Senjyu

Abstract : A novel multi-objective park and ride control approach is presented in this research. Park and ride will encourage the owners of the vehicles to leave their cars in the nearest points (on the edges of the crowded cities) and use public transportation facilities (train, bus, metro, or mon-rail) to reach their work inside the crowded city. The proposed control scheme is used to design electric vehicle charging stations (EVCS) to charge 1000 electric vehicles (EV) during their owners' work time. Cairo, Egypt is used as a case study. Photovoltaic (PV) and battery energy storage system (BESS) are used to meet the EVCS demand. Two multi-objective optimization techniques (MOGA and epsilon-MOGA) are utilized to get the optimal sizes of PV and BESS so as to meet the load demand and minimize the total life cycle cost. Detailed analysis and comparison are held to investigate the performance of the proposed control scheme using MATLAB.

Keywords : Battery Energy Storage System, Electric Vehicle, Park and Ride, Photovoltaic, Multi-objective

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