

Optimal Allocation of PHEV Parking Lots to Minimize Distribution System Losses

Authors : Mohsen Mazidi, Ali Abbaspour, Mahmud Fotuhi-Firuzabad, Mohamamd Rastegar

Abstract : To tackle the air pollution issues, Plug-in Hybrid Electric Vehicles (PHEVs) are proposed as an appropriate solution. Charging a large amount of PHEV batteries, if not controlled, would have negative impacts on the distribution system. The control process of charging of these vehicles can be centralized in parking lots that may provide a chance for better coordination than the individual charging in houses. In this paper, an optimization-based approach is proposed to determine the optimum PHEV parking capacities in candidate nodes of the distribution system. In so doing, a profile for charging and discharging of PHEVs is developed in order to flatten the network load profile. Then, this profile is used in solving an optimization problem to minimize the distribution system losses. The outputs of the proposed method are the proper place for PHEV parking lots and optimum capacity for each parking. The application of the proposed method on the IEEE-34 node test feeder verifies the effectiveness of the method.

Keywords : loss, plug-in hybrid electric vehicle (PHEV), PHEV parking lot, V2G

Conference Title : ICPSE 2015 : International Conference on Power Systems Engineering

Conference Location : Vancouver, Canada

Conference Dates : August 06-07, 2015