

Optimization and Operation of Charging and Discharging Stations for Hybrid Cars and their Effects on the Electricity Distribution Network

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Abstract : In this paper, the optimal placement of charging and discharging stations is done to determine the location and capacity of the stations, reducing the cost of electric vehicle owners' losses, reducing the cost of distribution system losses, and reducing the costs associated with the stations. Also, observing the permissible limits of the bus voltage and the capacity of the stations and their distance are considered as constraints of the problem. Given the traffic situation in different areas of a city, we estimate the amount of energy required to charge and the amount of energy provided to discharge electric vehicles in each area. We then introduce the electricity distribution system of the city in question. Following are the scenarios for introducing the problem and introducing the objective and constraint functions. Finally, the simulation results for different scenarios are compared.

Keywords : charging & discharging stations, hybrid vehicles, optimization, replacement

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