

A Hybrid Charging System Design for Electric Vehicles with Autonomous Power Source

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Abstract

The paper focuses on the development of hybrid battery charging systems for autonomous electric passenger vehicles. Aspects of elaboration and design methodology of the battery charging station are approached both from the three-phase electrical network, but also from a photovoltaic plant. A new structure of the battery charging station with power supply from a photovoltaic plant parallel to the public electricity grid was developed. The photovoltaic plant was dimensioned and the amount of electricity produced and consumed at the charging station was estimated. The excess of energy generated by the photovoltaic plant can be injected into the grid or, in offGrid mode, stored in buffer batteries.

Keywords: photovoltaic systems, energy consumption, design methodology, charging stations, power grids, inverters, hybrid power systems, electric vehicle, autonomous drive, storage battery, photovoltaic plant

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