

Modeling and Simulation of Standalone Photovoltaic Charging Stations for Electric Vehicles

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Abstract : Batteries of electric vehicles (BEV) are becoming more attractive with the advancement of new battery technologies and promotion of electric vehicles. BEV batteries are recharged on board vehicles using either the grid (G2V for Grid to Vehicle) or renewable energies in a stand-alone application (H2V for Home to Vehicle). This paper deals with the modeling, sizing and control of a photo voltaic stand-alone application that can charge the BEV at home. The modeling approach and developed mathematical models describing the system components are detailed. Simulation and experimental results are presented and commented.

Keywords : electric vehicles, photovoltaic energy, lead-acid batteries, charging process, modeling, simulation, experimental tests

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