

# Hybrid Charging Station

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**Abstract:** *A hybrid micro grid-powered charging station reduces transmission losses with better power flow control in the modern power system. However, the uncoordinated charging of battery electric vehicles (BEVs) with the hybrid micro grid results in ineffective utilization of the renewable energy sources connected to the charging station. Furthermore, planned development of upcoming charging stations includes a multiport charging facility, which will cause overloading of the utility grid. The project works on (1) the energy management strategy and converter control of multiport BEV charging from a photovoltaic (PV) source and its effective utilization; (2) maintenance of the DC bus voltage irrespective of the utility grid overloading, which is caused by either local load or the meagerness of PV power through its energy storage unit (ESU). In addition, the charge controller provides closed loop charging through constant current and voltage, and this reduces the charging time. The aim of an energy management strategy is to minimize the usage of utility grid power and store PV power when the vehicle is not connected for charging. To balance the load demand, the proposed system is connected to the grid through a three-phase bidirectional DC-AC (alternating current) inverter. The obtained results show that the proposed renewable charging mechanism is suitable for EV charging thus help creating pollution free environment.*

**Keywords:** Electric Vehicles, Synchronous Generator, Recharging Mechanism, Solar Energy, Wind Energy hybrid microgrid, battery electric vehicle, energy management strategy.

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