Packetized Plug-in Electric Vehicle Charge Management for 449 Node Distribution System

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Abstract

Because large-scale plug-in electric vehicle (PEV) adoption could stress power distribution systems due to simultaneous battery replenishing, PEV charging must be managed. A novel charging method called packetized charging (PC) provides non-disruptive service without soliciting user information. PC leverages a decentralized automaton approach to schedule 15-minute charge packets for PEVs. In this work, PC is applied to a previously studied 23kV/415V 100kVA distribution system with 22 LV distribution feeders. A Newton power flow is run on the system to prove that PC effectively mitigates stress at system nodes while providing non-disruptive charge to a group of anonymous users.

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