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Review on Grid to Vehicle and Vehicle to Grid Bidirectional Power Transfer Systems for EV Application

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Abstract: *Wireless Power Transfer (WPT) for Electric Vehicle (EV) battery charging application is one of the key upcoming technologies. The possibility of using EVs to transfer power back to the grid, utilizing the concept of Bidirectional Wireless Power Transfer (BD-WPT) is extensively being explored. The effect of integration of EV on grid is also of concern. This paper presents analysis of complete grid integrated BD-WPT system for controlling power transfer between grid and EV battery, along-with ensuring Unity Power Factor (UPF) at grid side. Mathematical model of each component in the system is presented which is then used to design vehicle and grid side controllers for achieving desired output. Concepts stated analytically are validated by simulation in MATLAB (Simulink).*

Keywords: Photovoltaic (PV), Transformerless, Inverter

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