The State-of-The Art: DC-to-DC Converters for Fuel Cell Vehicular Power Train – Power Electronics in Fuel Cell Technology

By:

Sanjeevikumar Padmanaban
Department of Energy Technology
Aalborg University, Esbjerg, Denmark
san@et.aau.dk

The automobile companies in the global market focused to the recent technologies towards, the Hydrogen (H_2) and FC-VPT, to improve the Tank-To-Wheel (TTW) efficiency. Cost effective solution for 'Eco' friendly, free of emission and high power capacity are the inherent benefits. The DC-DC power converters plays the key influence in boosting the fuel cell stack power through voltage conversion. Therefore, ensure the demand of the motor and transmission in the vehicles. Several DC-DC converter topologies proposed for various vehicular applications. The state-of-the art technologies with the unidirectional non-isolated DC-DC Multistage Power Converter (MPC) configuration for Fuel Cell – Vehicular Power Train (FC-VPT) application will be discuss in the presentation. DC-DC power converters with new modified version are viable and cost effective solutions with reduced size and increased efficiency.

Comprehensive review, comparison of different topologies and suitability for different applications will be discuss in the presentation, specifically applied to the power train of small vehicle to large vehicles (bus, trucks etc.). Finally, the advantages/disadvantages will pointed out in the presentation for the prominent features of each converters, its challenges, and application for fuel cell (FC) technology.