

## Design and Performance Analysis of a Fuel Cell / Battery Hybrid Minibus

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In terms of the vehicle efficiency, a fuel cell hybrid system has advantages compared to a conventional internal combustion engine and a fuel cell alone-powered system. In this paper, the performance of the fuel cell hybrid bus in the design phase is simulated based on the models for the fuel cell stack, the electric battery, the fuel cell balance of plant, the controller, the motor and transmission, and the vehicle itself. The vehicle is a city bus with the 25 seats. The maximum speed is 70kmh. The power system is integrated with 2 25kw fuel cell modules and 24 12volt batteries. The maximum power of the electric drive motor is 90kW. To control the electric load between the battery packs and the fuel cell system, a fuzzy logic is used. The control strategy allows the fuel cell to adaptively supply power to the system according to the power demand and the battery state of charge. The vehicle efficiencies at several different control strategies are simulated for a city driving mode and are compared one another. Consequently the proposed simulation scheme is useful to select the best control strategies by evaluating the performances of the alternative hybrid systems.