

# PV, Battery and Ultra-capacitor based Energy Management Concept in Electric Vehicle

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**Abstract:** Electrical Vehicle (EVs) have recently attracted considerable attention and so did the development of battery technologies. Although the battery technology has been significantly advanced, the available batteries do not entirely meet the energy demand of EV power consumption. Incorporation of solar panel (PV) and Ultra capacitor (UC) based Hybrid Energy Storage System (HESS) is developed to maximize EV drive range. It also reduce the stress on battery during dynamic conditions. This paper represents the state of art for the hybrid energy sources with PV, Battery and Ultra capacitor (UC). The advantage of this setup offer better acceleration performance, longer driving range and controlled regenerative braking. The Bidirectional DC/DC converter is used for proper flow of power to motor during various stage of driving cycle.

**Keyword** –Battery, Ultra-capacitor, Hybrid Vehicle, DC-DC Bidirectional converter, Power Management, Photovoltaic cell.