

## Light Car Assisted by PV Panels

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**Abstract :** This work presents the design and simulation of electric equipment for a hybrid solar vehicle. The new drive train of this vehicle is a parallel hybrid system which means a vehicle driven by a great percentage of an internal combustion engine with 49.35 kW as maximal power and electric motor only as assistance when is needed. This assistance is carried out on the rear axle by a single electric motor of 7.22 kW as nominal power. The motor is driven by 12 batteries connecting in series, which are charged by three PV panels (300 W) installed on the roof and hood of the vehicle. The individual components are modeled and simulated by using the Matlab Simulink environment. The whole system is examined under different load conditions. The reduction of CO<sub>2</sub> emission is obtained by reducing fuel consumption. With the use of this hybrid system, fuel consumption can be reduced from 6.74 kg/h to 5.56 kg/h when the electric motor works at 100 % of its power. The net benefit of the system reaches 1.18 kg/h as fuel reduction at high values of power and torque.

**Keywords :** light car, hybrid system, PV panel, electric motor

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