Hybrid-electric vehicles

Hybrid-electric vehicles (HEVs) combine the benefits of gasoline engines and electric motors, with the aim of obtaining different objectives, such as improved fuel economy and increased power.

HEVs make use of efficiency-improving technologies such as regenerative braking, which converts the vehicle's kinetic energy into battery-replenishing electric energy.

When an electric motor applies resistance to the drive train causing the wheels to slow down, the energy from the wheels turns the motor. This motor then functions as a generator, converting energy normally wasted during coasting and braking into electricity, which is stored in a battery.

The electric motor provides additional power to assist the engine during accelerating, passing, or climbing hills. This allows a smaller, more efficient gasoline engine to be used.

Many HEVs also automatically shut off the engine when the vehicle comes to a stop and then the engine is restarted when the accelerator is pressed. This prevents wasted energy during idling.

These features as well as others have made HEVs fuel efficient. For example, Toyota has announced that the third generation of its popular Prius HEV has attained a fuel consumption rate of about 35 km/liter during the 10-15 mode test cycle. In actual driving, the fuel consumption would be about 20 km/liter.