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Hybrid Vehicle Technologies and their potential for reducing oil use

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Vehicles with hybrid gasoline-electric powertrains are starting to gain market share. Current hybrid vehicles add an electric motor, battery pack, and power electronics to the conventional powertrain. A variety of engine/motor configurations are possible, each with advantages and disadvantages. In general, efficiency is improved due to engine shut-off at idle, capture of energy during deceleration that is normally lost as heat in the brakes, downsizing of the conventional engine, and, in some cases, propulsion on the electric motor alone. Ongoing increases in hybrid market share are dependent on cost reduction, especially the battery pack, efficiency synergies with other vehicle technologies, use of the high electric power to provide features desired by customers, and future fuel price and availability. Potential barriers include historically low fuel prices, high discounting of the fuel savings by new vehicle purchasers, competing technologies, and tradeoffs with other factors desired by customers, such as performance, utility, safety, and luxury features.