

Hybrid Vehicles

Fact Sheet



In December 2004, the Atlantic County Utilities Authority (ACUA) purchased four Ford Hybrid Escapes as part of its commitment to using renewable sources of energy.

The New Jersey Board of Public Utilities Alternative Fuel Vehicle Rebate Program provided a \$4,000 rebate on each vehicle, so the net cost of the hybrid was no more than a standard Ford Escape. The vehicles came from Winner Ford in Cherry Hill under state contract. Since that time, the ACUA has purchased two additional Ford Escape Hybrids and five Silverado Hybrid trucks, bringing the fleet total to 11 hybrid vehicles.



The Atlantic County Utilities Authority fleet currently consists of 11 hybrids.

- Hybrid technology plays an important role in helping to reduce greenhouse gases and our dependence on fossil fuels.
- The Ford Hybrid Escape was the first vehicle to combine SUV capability with the fuel economy and low environmental impact of a full hybrid. This hybrid can get more than 35 miles per gallon in city driving and anywhere between 400-500 miles of travel on one tank of gasoline. It was also designed with a clean PZEV engine that has near zero emissions.
- A hybrid vehicle or HEV is powered by two sources, a gasoline engine and an electric motor.
- The Ford Escape Hybrid gets approximately 10 miles per gallon more than the conventional Ford Escape (US EPA 2006 Fuel Economy Guide). Based on this estimate, the ACUA will save the energy equivalent of 114 barrels of crude oil a year by using these vehicles.
- The Chevrolet Silverado Hybrid Pickup Truck is the first full size pickup truck to use hybrid technology.
- Its total collective power of 2,400 watts can run power tools or household items, such as a refrigerator. It can be used as a generator in remote areas.
- The 14,000-watt electric motor works with a Vortec 5.3L V8 engine to boost city fuel economy by two miles per gallon without a loss in power, compared to its conventional counterpart. This equates to 18 mpg.
- It features an engine "start/stop" system that automatically shuts the engine off to save fuel when braking at speeds below 13 miles per hour or when the vehicle is not moving.



ACUA purchased its first hybrid Chevrolet Silverado in Sept. 2006.

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- A regenerative braking system takes some of the inertial energy from moving the vehicle and turns it back into electrical energy. This energy is stored in the Energy Storage Module.



Most hybrids operate with either a parallel or series design system. They also incorporate new technologies such as regenerative braking, electric motor drive/assist, and automatic start/shutoff.

- The parallel design has a fuel tank that supplies gas to the gasoline engine and it also has a battery that supplies power to the electric motor. Both the gas and electric motors can start the transmission, which causes the wheels to turn.
- In the series design, a gasoline engine turns a generator that either supplies energy to charge a battery or powers an electric motor that turns on the transmission. In this design, gasoline does not directly power the vehicle. Some hybrids incorporate both designs.

Hybrids also use new forms of technology such as regenerative braking. When brakes are applied to stop a vehicle's wheels from turning in a gasoline vehicle, the energy from the wheels is lost. These hybrids use the energy from the wheels turning as a generator, storing the energy in the battery for later use.

Some HEVs use an electric motor to drive the vehicle at lower speeds when using a gasoline engine is least efficient. An electric motor can also be used to assist the gasoline engine during times of demand, such as accelerating and climbing hills. The added help from the electric engine allows for a smaller and more efficient gasoline engine to be used.

Automatic start and shutoff technology takes into account that a hybrid does not need to rely on its gasoline engine, therefore it can automatically shut off when the car comes to a stop, and automatically restarts when the accelerator is pressed. This technology prevents energy from being wasted during idling.

Since the introduction of hybrids to the American market, more and more auto makers are designing hybrid vehicles, including 4x4 trucks. There are also heavy duty hybrid vehicles that run on diesel and electric.

Why choose a hybrid vehicle over its gasoline counterpart? There are several reasons why hybrids make a better choice including economics and the environment.

- Hybrids maximize fuel efficiency, squeezing out more miles per gallon of gasoline and saving money on refuelling costs.
- The engines also have less wear and tear, requiring less maintenance than their gasoline counterparts.
- Since hybrids maximize fuel efficiency and also incorporate running on electricity, their tailpipe emissions are also significantly lower, reducing greenhouse gases and air pollution.
- The large amount of CO₂ produced by most gasoline engines has a significant impact on global warming.

Currently, there is a federal tax incentive to buying new hybrids and some states and local governments might offer additional incentives, please visit www.irs.gov for specific details on available tax credits. In addition, the New Jersey Turnpike Authority allows hybrid electric vehicles and alternative fuel vehicles to travel in the NJTA HOV lane.

Links:

www.fueleconomy.gov

<http://auto.howstuffworks.com/hybrid-car1.htm>



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