

Transportation

The VOLT, GM's New Plug-In Hybrid Electric Vehicle (PHEV)

General Motors tried once before to perfect a viable electric car – and they are trying again. Now it's the Volt, and this time they should be able to overcome the difficulties they encountered with the EV1. That is as long as present financial difficulties do not derail the effort.

The Chevy Volt is a plug-in hybrid vehicle that is scheduled, barring further industry financial setbacks, to be available to the public in the first half of 2010.



Unlike conventional Hybrids, the Volt operates entirely on electric power. With a full charge, the Lithium Ion battery pack will power the vehicle for 40 miles before the 3 cylinder internal combustion engine kicks in. This covers the daily commute of 75% of Americans, which averages approximately 33 miles per day.

Whether the Volt is or is not a true hybrid is a matter of definition. For the first 40 miles, it is a true electric vehicle. After that, the small onboard engine starts up and drives a generator recharging the batteries. The potential range of a full tank of fuel is as much as 640 miles. The batteries can also be charged by plugging in to a residential receptacle similar to that used by a dryer.

In many ways, the EV1 broke new ground – it had style and good performance but, best of all, it did not emit pollutants. However, two things were definitely not in its favor – gasoline was cheap then and batteries were not up to the necessary capacity. Today, fuel is no longer cheap, and battery technology has improved considerably and is getting better. A hybrid that can be plugged into the electrical grid will solve the primary complaint about the regular hybrid and utilize the electrical generation capacity now largely wasted during nighttime hours.

Some have said that GM let the EV1 fail in order to demonstrate that the electric vehicle was not the answer and to placate the big oil companies. But GM lost over \$1 Billion on the EV1. There were cheaper ways to keep the oil companies happy then, and now even those companies readily admit the absolute necessity to conserve our finite oil reserves and reduce our dependence on unfriendly suppliers.

“Popular Science” magazine (Nov. '08, page 50) gives an excellent presentation of some of the work being done to perfect the better battery needed for a PHEV. A majority of American drivers use their vehicles less than 40 miles per day, so, as the PopSci article says, “most Volt drivers, for instance, would never use the car’s gas-powered back-up engine on a normal driving day.” – even more impressive, a plug-in hybrid sedan with an all-electric range of 50 miles should average 150 mpg overall.”

As photovoltaic equipment becomes more economical, it, too, will provide a means of recharging the batteries in the Volt and other makes that will become numerous on our streets and highways. Solar and other "renewable" electricity production is rapidly becoming available; as sure as the sun shines and the winds blow, we will be able to produce much of the power we need without polluting our air and water.

A proven way of reducing our dependence on oil is to use more hydrogen (H₂ - the universe's most plentiful element.) An internal combustion engine (ICE) burning H₂ not only runs well, it actually cleans the air as it runs! A solar powered H₂ electrolyzer/fuel cell could produce the electricity needed for a PHEV and much of that needed in an average home. Mixing H₂ with compressed natural gas would make the large number of vehicles using that fuel run much cleaner and reduce the consumption of another finite fuel.

Our modern society will never be able to stop using oil altogether, though. Even with recycling, oil will still be needed for the production of many of the items we use every day, plastics in particular.

Becoming energy independent is going to happen – it has to happen – and the plug-in hybrid and Hydrogen will be important parts of the paradigm change. We hope the current financial crisis in the auto industry does not relegate the Volt to the same fate as the EV1.

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