



## Are Electric Cars Better for the Environment?

By Josh Clark | Fri Jul 30, 2010 08:55 AM ET



A full 12 years after Toyota sold its first Prius in the United States and came to pretty much dominate the U.S. market for environmentally friendly cars, drivers in America will have two more options for green transportation: Chevrolet's Volt and Nissan's Leaf.

The Volt is a gas-electric hybrid, but unlike the Prius, the gas is not used to drive the power train. Instead it has an electric engine that can propel the car 40 miles on one charge. If the car needs more range, a gas engine kicks in to power a generator that creates additional electricity for the electric motor. The Leaf is an all-electric car that has a 100-mile range on a rechargeable lithium-ion battery that can be fed using a standard three-prong household electrical outlet, and lacks even a tailpipe.

At first blush it would seem that the Leaf, or any all-electric car for that matter, trumps its internal combustion-carrying counterparts. With conventional cars, this is pretty much true.

Combustible engine cars are noisy, burn gasoline – and grossly inefficiently at that – pollute and emit chemicals that are bad for the atmosphere. Electric vehicles are quiet and spew no emissions.

But the difference in environmental impact between combustible engine cars, hybrid vehicles and all-electric ones isn't quite as large as it first appears.

It all comes down to carbon emissions, and even though electric vehicles spew zero emissions, they aren't necessarily carbon neutral. So that begs the question, are they better for the environment than ones powered by fossil fuels?

"Zero-tailpipe emissions unfortunately don't necessarily mean zero emissions," says Dennis Ruez Jr., the environmental studies department chair at the University of Illinois at Springfield.

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Carbon-neutrality refers to emissions of carbon dioxide that are released during any point in the life span of the vehicle, from the earth-moving machines used to mining the lithium for the car's batteries, to the plant where the car is built, to the power plant that feeds the electrical source the car is ultimately plugged into. None of those can emit carbon dioxide. If any do, the electric vehicle isn't carbon-neutral.

Attaining complete carbon neutrality is virtually impossible, or at least so unattainable it's akin to holding out for a vehicle that runs on cold fusion. Instead, researchers are chipping away at problems in smaller sizes, with a specific focus on the power plant -- the source of most EV emissions.

"The well-known issue here is the source of the electricity," says Ruez. "If the electricity is from a coal- or gas-fired power plant, then there are still carbon emissions from that vehicle's use."

There is about a 50-percent chance in the United States that the [electricity that's used to charge the batteries of a plug-in electric vehicle](#) is generated by burning coal. Since the burned coal used to power an electric vehicle emits carbon dioxide to power the electric car, [it goes on the car's emissions tally](#).

"The general consensus is that if you power an electric vehicle from coal, the net carbon emissions are about the same as a gasoline vehicle," says Paul Denholm, senior analyst at the National Renewable Energy Laboratory in Golden, Colo. "But that's the worst-case scenario; anything that is a cleaner source is an improvement."

Such a problem can also provide solutions; at the very least, energy researchers looking to make improvements on net carbon dioxide emissions have a clear picture of their point of attack.

Investigating ways to reduce the carbon dioxide emissions of power plants that generate electricity through fossil fuels can lead to sweeping reductions in carbon dioxide emissions, especially [as sales of plug-in electric vehicles rise](#). Influencing the source, in other words, can have a metastasizing effect elsewhere along the electrical grid.

"Using a centralized energy source would facilitate future environmentally friendly steps," says Ruez. "It's easier to add carbon scrubbers to a single power station [than to 100,000 vehicles in an area](#)."

Ultimately, both Ruez and Denholm agree that electric vehicles are better for the environment than cars that run on fossil fuels, as they represent an important step toward reducing emission. As the number of electrical grows, utility companies will have more incentive to upgrade the electrical grid and make renewable energy sources more practical. And that is good for everyone.

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