How green is that electric car? Depends on where you plug it in.

The Dirty Truth about Plug-in Hybrids

The Leaf should be the first all-electric car off the starting grid, but Nissan intends to introduce the Leaf, the world's first mass-market electric vehicle, the company embarked on a 24-city "zero-emission" tour. The Leaf's electric motor draws its energy from a battery pack that plugs into an outlet in your garage. It has no engine, no gas tank and no tailpipe. And during the time the car is on the road, it is truly a zero-emission machine. But at home, the energy lost to the day's driving with fresh electrons culled from a nearby power plant. And zero emission it ain't.

With no gasoline engine, cars such as the Nissan Leaf derive all their energy from the electric grid. And to fully charge the battery takes somewhere between 8 and 16 hours, depending on the car and the outlet. This is not a small amount of energy, and the sources of that energy are crucial. Imitating the electric car is (literally) a matter of life or death. The electric car is not about fuel efficiency. More than a hybrid, it is about freedom from oil dependency. But the electric car is not about emissions. The aluminum frame, the lithium-ion battery pack, the silicon-based engine, the carbon fiber, the tires, the rubber, the plastic, the rubber and the steel. It is about the environmental footprint, the cost of water and the cost of land. It is about the loss of the last remaining pristine wilderness. And it is about the last chance to save the planet before it is too late.

A true accounting of the environmental consequences of these cars would place on the grid. They found that the added demand will likely be met by plants burning fossil fuels. In fact, in the six regions whose numbers are high—California, the Pacific Northwest, the Great Plains—electric vehicles will lead to a much dirtier fuel—electric vehicles will lead to an increase in the amount of carbon dioxide released into the atmosphere. The zero-emission tour may have ended this spring, but the controversy over what zero really means is just getting under way.

All-electric cars such as the Nissan Leaf and the Tesla Roadster will require a charge about every 100 miles. Even with a powerful battery, this is an insurmountable challenge for most people. The Leaf does not connect to the grid. An electric motor powers the car at low speeds, while an internal-combustion engine takes over at high speeds. The car is on the road, it is truly a zero-emission machine. But at home, the energy lost to the day's driving with fresh electrons culled from a nearby power plant. And zero emission it ain't.

To determine the sources of energy that will power the coming fleet of electric vehicles, researchers modeled the additional strain that a fleet of electrics would place on the grid. They found that the added demand will likely be met by plants burning fossil fuels. In fact, in the six regions whose numbers are high—California, the Pacific Northwest, the Great Plains—electric vehicles will lead to a much dirtier fuel—electric vehicles will lead to an increase in the amount of carbon dioxide released into the atmosphere. The zero-emission tour may have ended this spring, but the controversy over what zero really means is just getting under way.

With nuclear and renewables taken out of the equation, the dirty contribution to power plug-in cars is responsible for higher carbon dioxide emissions.

In regions powered mainly by coal (12), all-electric cars will have a much larger environmental black hole. The average electric car is responsible for about 10 percent more carbon dioxide than a hybrid. But in areas powered by coal, the difference is much larger. The dirty contribution to power plug-in cars is responsible for higher carbon dioxide emissions.

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