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Former Electric-car Engineer: Electric Cars Pollute More Than Gas

Is the only "green" aspect of electric cars the money some companies make off them? If former plug-in advocate and General Motors engineer Ozzie Zehner (shown) is correct, this is exactly the case.

Author of the book *Green Illusions*, Zehner once built his own hybrid car that could run on electricity or natural gas. And, he writes in a recent article entitled "Unclean at Any Speed," he was convinced cars such as his "would help reduce both pollution and fossil-fuel dependence."

But he now says, "I was wrong."

Electric cars certainly are de rigueur among righteous environmentalists. They receive first-son status, with nations and states offering tax incentives for buying them, special driving and parking privileges (use of HOV lanes and VIP spots), as well as other benefits. But their supposed benefit to the environment is illusory, says Zehner — and that the electricity powering them is generally made in pollution producing power plants is just the tip of the iceberg.

But that's where Zehner starts, writing that while it's "relatively easy to calculate the amount of energy required to charge a vehicle's battery," even the cleaner options for generating electricity (as opposed to oil or coal) have effects that are both real and hard to assess. He elaborates:

> Natural gas requires burning, it produces CO_2, and it often demands environmentally problematic methods to release it from the ground. Nuclear power yields hard-to-store wastes as well as proliferation and fallout risks. There's no clear-cut way to compare those impacts. Focusing only on greenhouse gases, however important, misses much of the picture.

And the picture only gets more complex from there. Zehner makes the following basic points (all quotations are his unless otherwise indicated):

• Electric cars cannot currently be charged on a wide scale with renewable resources such as solar. Even if they could, however:

> Solar cells contain heavy metals, and their manufacturing releases greenhouse gases such as sulfur hexafluoride, which has 23,000 times as much global warming potential as CO_2, according to the Intergovernmental Panel on Climate Change. What's more, fossil fuels are burned in the extraction of the raw materials needed to make solar cells and wind turbines — and for their fabrication, assembly, and maintenance. The same is true for the redundant backup power plants they require. And even more fossil fuel is burned when all this equipment is decommissioned.

• A more responsible electric-car analysis would consider not just charging the vehicle, but also "the environmental impacts over the vehicle's entire life cycle, from its construction through its operation and on to its eventual retirement at the junkyard."

• An electric car's battery pack is extremely heavy, which causes the manufacturer to compensate by constructing the remainder of the vehicle with "lightweight materials that are energy intensive to produce and process — carbon composites and aluminum in particular. Electric motors and batteries add to the energy of electric-car manufacture."

• The rare earth metals used in many magnets in electric cars are expensive and uneconomical to extract on a wide scale. And the "global mining of two rare earth metals, neodymium and dysprosium, would need to increase 700 percent and 2600 percent, respectively, over the next 25 years to keep pace with various green-tech plans." Alternatives do exist, but exploiting them would involve efficiency-and-cost trade-offs.

• The extraction and processing of materials found in batteries — such as lithium, copper, and nickel — "demand energy and can release toxic wastes." In addition, extracting them in poorly regulated areas imperials not only workers, but also "surrounding populations through air and groundwater contamination."

• A National Academies' study considered multiple dimensions of electric vehicles' associated effects — such as "vehicle construction, fuel extraction, refining, emissions, and other factors" — and "concluded that the vehicles' lifetime health and environmental damages (excluding long-term climatic effects) are actually *greater* than those of gasoline-powered cars"; in fact, "the study found that an electric car is likely worse than a car fueled exclusively by gasoline derived from Canadian tar sands."

• When electric cars' total effects are considered, the level of "greenhouse-gas" emissions associated with them is only marginally lower than that associated with gas or diesel vehicles.

• A Norwegian study drew similar conclusions, stating that all things considered, "electric vehicles consistently perform worse or on par with modern internal combustion engine vehicles, despite virtually zero direct emissions during operation."

• A University of Tennessee study of electric vehicles in China also concluded that their effects were, on balance, worse than those of conventional autos.

• Combustion vehicles' emissions are concentrated in wealthier urban areas whereas the activities necessary to obtain the substances for the creation and operation of electric vehicles — such as nuclear-fuel, heavy-metal and mineral extraction, and energy generation — occur mainly in more depressed rural regions. This means that electric technology may just shift the pollution burden from the rich to the poor.

• Even when projecting technological advancements out to 2030, there still appears to be no advantage to embracing electric-vehicle technology.

Moreover, the one supposed benefit associated with the use of electric vehicles — the almost negligible greenhouse-gas emission reduction — is no benefit at all if critics of man-caused climate-change theory are correct.

Zehner concludes with an apt analogy: Transitioning from conventional to electric vehicles may just be like "shifting from one brand of cigarettes to another." The question is, though, with so many interests addicted to the green, can we kick the habit before the economy and environment get the electric shock of good intentions?

Photo: Ozzie Zehner