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Study: Electric cars not as green as you think

Electric cars in Germany could pollute more than gasoline cars, and the grid there could collapse if everyone charges at the same time, a report concludes.

by **Erik Palm** | May 1, 2009 11:20 AM PDT

The environmental benefits of electric cars are being questioned in Germany by a surprising actor: the green movement. But those risks don't apply in the U.S., the American electric-car lobby asserts.



(Credit: J?rgen Matijevic/WWF)

The German branch of the environmental group World Wildlife Foundation (WWF) has conducted a **study** [<http://www.wwf.de/downloads/publikationsdatenbank/ddds/30496/>] together with **IZES** [<http://www.izes.de/>], a German institute for future energy systems, on the environmental impact of electric vehicles in Germany.

Just like the U.S., Germany has an ambitious **goal** [<http://www.elektromobilitaet2008.de/konferenz/presseerklaerung/view>] of introducing electric vehicles. Germany, which today has 41 million **cars** [<http://reviews.cnet.com/car-tech/>], aims to have 1 million electric cars or plug-in hybrid vehicles on the road by 2020. The conclusion of the study is that these electric cars only reduce greenhouse gases marginally.

The study, which was published in German in March, has not been widely circulated in English yet. The WWF Germany said a summary in English is set for publication this

summer.

"What surprised us was that the carbon dioxide savings were so small," Viviane Raddatz, vehicle expert at WWF Germany, said in a phone interview from Berlin.

In a best-case scenario, the WWF assumes that the 1 million electric cars or plug-in vehicles would be running on renewable electricity and used at maximum mileage. Electric vehicles do not yet have the range of regular cars.

The carbon dioxide emission reductions from these 1 million electrical vehicles in Germany's transportation sector would be only 1 percent, according to the study, and overall national carbon dioxide emissions would only be cut by 0.1 percent. "That is not a very big deal," Raddatz said, adding that "it is not going to help us out of the transportation emission mess."

Worst-case scenario

A worst-case scenario would be that the electric cars would run on electricity from coal instead of from renewable sources.

That could be the case when extra electricity is needed to charge the plug-in cars in the early evening. That's when commuters could significantly add to the electricity demand at a time of day when people are returning home and electricity use is already peaking.

Today, the German plants that deliver marginal electricity are fueled by coal. That is the main problem, according to the study. The research adds that to produce the same amount of energy, coal emits more carbon dioxide than even gasoline.

"The irony is that you don't need a lot more electricity for electric cars," Raddatz said. "But the problem is that if they cause these peaks, we would have to have power plants that would be ready to start (as) the massive charging starts."

An electric car with a lithium ion battery powered by electricity from an old coal power plant could emit more than 200g of carbon dioxide per km, compared with current average gasoline car of 160g of carbon dioxide per km in Europe, according to the study. The **European Union goal** [http://ec.europa.eu/environment/air/transport/co2/co2_home.htm] for 2020 is 95g of carbon dioxide per km.

Load management needed

The WWF said smart systems that help **manage the energy load** [http://www.cnet.com/8301-11128_3-10230930-54.html] and **battery charge systems** [http://www.cnet.com/8301-11128_3-10225464-54.html] could smooth the peaks overnight. With more than 1 million vehicles plugged in, load management is essential, but a smart grid is not enough, according to the study. A lot of electricity storage is needed as well.

"Car batteries are one thing, but you need to develop other kinds of storage as well," Raddatz said. You want to make sure you can get a lot of energy from renewable or you have no CO2 savings."

Germany has voted to phase out nuclear power by 2020, so the WWF has not considered that energy source in its study after 2020.

As mentioned before, the WWF assumes that only half the current transportation system could be replaced by electric cars.

The study says that with electric cars' present range they could only replace, at best, half of the kilometers driven.

President Obama has set a **goal** [http://www.cnet.com/8301-11128_3-10200328-54.html] for the U.S. to have 1 million electric vehicles by 2015.

The Electric Drive Transportation Association (EDTA), the lobby organization for electric cars in the U.S., said that the risks raised by the WWF study in Germany will not be the same in the U.S.

"For the U.S., there will be environmental benefits because the grid is getting cleaner," said Jennifer Watts, spokeswoman for EDTA. She quotes a study by the Pacific Northwest National Laboratory saying that 73 percent of light-duty vehicles could be connected to the grid today without a problem, and that an **EPRI study** [http://my.epri.com/portal/server.pt?space=CommunityPage&cached=true&parentname=ObjMgr&parentid=2&control=SetCommunity&CommunityID=404&RaiseDocID=00000000001015326&RaiseDocType=Abstract_id] shows that each region of the country will yield reductions in greenhouse gas emissions when the electric car is introduced.

Still a place for electric cars

The German study--which limited its scope to studying energy efficiency and did not consider the economics of electric vehicles--does not rule out the electric car. It emphasizes that electric cars could have a future role for low-carbon urban transport for individuals. It also suggests that marginal electricity should come from a clean source and a smart grid, with smart load management needed. But that system would take a long time to develop, the study stresses.

"The electric car is a serious option for low-carbon future transportation," Raddatz said, "but must be linked with renewable energy to make the difference."

About Erik Palm []

Erik Palm, a business reporter for Swedish national television, is joining CNET News as a spring 2009 fellow with Stanford University's Innovation Journalism program. When he's not working, he enjoys kayaking and exploring California's hiking trails. **E-mail Erik** [<mailto:erik.palm@cbs.com>].

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