

Accelerating Market for Electric Cars: Saving Fuel Costs and Emissions
Clean Vehicles Program
Union of Concerned Scientists
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Sales of EVs continue to grow across the nation, with California leading the way

Sales of electric vehicles (EVs), including both plug-in hybrids and battery electrics, continue to rise. More than 90,000 EVs were sold in the United States in 2013 — more than double 2012 EV sales. In California, sales of EVs increased more than 100 percent in 2013 compared to the previous year, and the state was home to nearly half (46 percent) of all new plug-in vehicles in the U.S. In 2013, plug-in cars were 2.5 percent of new vehicle sales in California.

New models of EVs will hit showrooms in 2014. BMW is already reporting significant interest in its upcoming battery electric i3 car and Hyundai plans to make first deliveries this spring of its hydrogen fuel cell powered Tucson crossover SUV. Toyota also has plans to ship a sporty fuel cell electric sedan within a year. As new models and types of electric vehicles become available, consumers will have more choices to reduce fuel costs and emissions than ever before.

Growing plug-in vehicle sales will create significant oil savings. Americans have purchased almost 170,000 plug-in vehicles in the last three years, avoiding the burning of 45 million gallons of gasoline per year. This replacement of gasoline with electricity saves Americans over \$100 million per year in avoided fuel costs. Californians saved more than \$40 million in fuel costs and reduced emissions of carbon dioxide by 140,000 tons per year.

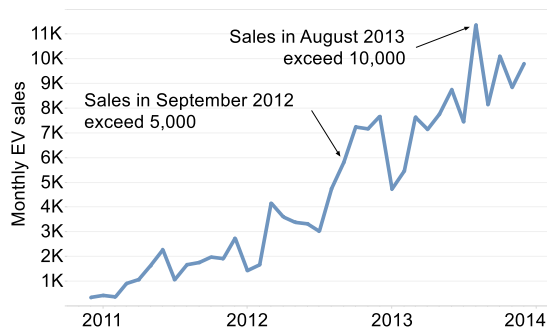


Figure 1: Monthly U.S. EV sales

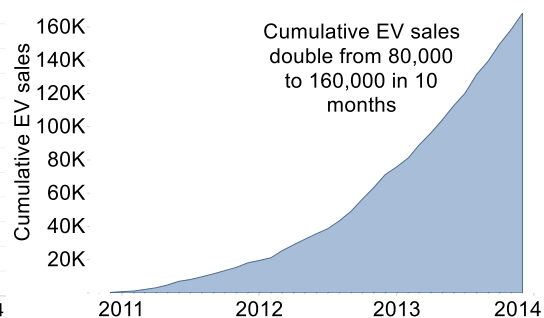


Figure 2: Total U.S. EV sales

Incentives are working

Incentives are helping to drive plug-in vehicle purchases. Four of the top five cities (San Francisco, Los Angeles, Seattle, New York City, and Atlanta) for plug-in vehicles are in states (California, Washington, Georgia) with financial incentives. Four of the top five cities are also in regions that allow HOV/carpool lane access to solo plug-in vehicle drivers.

California is the leader in plug-in sales and the state provides both HOV access and up to \$2,500 in purchase rebates.

Survey finds high level of EV support and suitability

UCS, with Consumers Union (publisher of *Consumer Reports*), conducted a nationwide survey to examine driving needs and opinions about EVs. The survey found that 42 percent of U.S. households could use one of today's EVs, given current access to electric outlets and driving needs. Notable was the opinion towards EVs: 65 percent of Americans think electric vehicles are an essential part of our nation's transportation future for reducing oil use and global warming pollution, with 60 percent saying they would consider owning an EV.

The [survey results](#) indicate that California policies that encourage the use of vehicles with little to no tailpipe emissions match the interests and concerns of a majority of consumers .

If everyone who could switch to driving on electricity did so today, the nation would:

- * Save more than 15 billion gallons of gasoline each year, more than all the gasoline consumed by the entire state of California in 2012.
- * Avoid 89 million metric tons of greenhouse gas emissions each year, equivalent to removing 14 million of today's gasoline cars from the road a year; and
- * Save \$33 billion on fuel each year – based on gas prices of \$3.60 per gallon and electricity costs of 12 cents per-kilowatt-hour.

The results of the survey not only indicate that millions of households could utilize an EV today, but also show how that figure could grow in the future. The survey found that 33 percent of respondents did not have access to parking with an electrical outlet, but met the other basic criteria for owning a plug-in hybrid electric vehicle. In addition, more than a third, 37 percent, agreed that having access to charging at the workplace would increase the likelihood of considering an EV in their next vehicle purchase.

While incentives that lower the cost of purchasing an electric vehicle will continue to play a key role in expanding the market for these vehicles, the findings suggest that efforts to increase access to vehicle charging options at home and the workplace can also help make EVs a more likely choice for vehicle buyers.

Fuel cell electric vehicles rolling out

[Toyota and Hyundai will be rolling out their new fuel cell vehicles within a year.](#) Hyundai's hydrogen-powered SUV will be leased in Southern California starting this spring and Toyota will follow with a sporty sedan in early 2015 in "significant numbers" according to the manufacturer.

Hydrogen fuel cells marry the advantages of clean, efficient electric vehicles with the convenience of fast refueling. Hydrogen made today from natural gas [gives about the same total emissions per mile as charging a plug-in vehicle with electricity generated from natural gas](#). But hydrogen can also be made from renewable sources like biomass and solar power, so in the future hydrogen-powered vehicles will be even cleaner.

A key advantage of hydrogen fuel cell vehicles is that they can be refueled at a filling station in a short time. This means that drivers who would rather not plug in a battery electric car can still use a clean electric motor to get around. The filling time is about the same as a gasoline vehicle, [about five to ten minutes](#) for a 300-mile range.

Battery electric, fuel cell electric, and more efficient gasoline vehicles have often been portrayed as competitors. However, this isn't a winner-take-all situation because these technologies are complementary. Plug-in electrics can take advantage of the existing electric infrastructure and smaller electric cars can be especially efficient and cost-effective. Hydrogen fuel cells are a good option for larger vehicles, longer distance driving, and for drivers without a convenient spot to recharge.

California is providing up to \$20 million per year to help support the development of a hydrogen filling station network. Currently, there are nine public hydrogen stations in the Los Angeles area, with 19 more in development in both Southern and Northern California.

Heavy Duty & Freight Electrification

Electric vehicle technology isn't just for cars. Hybrid trucks that have both an engine and electric motor are being used to save on fuel costs. Also, we are now seeing clean all-electric battery and fuel cell delivery trucks and buses being used, greatly reducing the emissions compared to vehicles they replaced. In California, incentive programs have put more than 1,200 hybrid and 375 all-electric trucks and buses on the road. Switching from diesel to electricity for trucks and buses saves on fuel costs and also reduces toxic air pollution. This is especially important in communities that currently are most impacted by heavy-duty vehicle use, such as those living near ports and major freight corridors.