

# Oil Savings in Action: Electric Vehicles Methodology and Assumptions

Union of Concerned Scientists  
October 2013

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Many statistics used in the [Oil Savings in Action: Electric Vehicles infographic](#) are based on the Union of Concerned Scientists (UCS) plan to reduce projected U.S. oil use in half within 20 years. The UCS [Half the Oil plan](#) is built on an analysis of practical oil savings solutions that are either already at work or that have been developed by industry, national laboratories, or researchers in academia. By cutting our projected oil use in half, we can save money, create jobs, protect our health, lower global warming emissions, and establish America as a global leader in transportation technology.

## Resources

*Annual Summary of Production for Gulf of Mexico Region*, U.S. Department of the Interior, September 2013. Online at

<http://www.data.boem.gov/homepg/pubinfo/repcat/product/pdf/Annual%20Production%202005%20-%202013.pdf>.

*Car Scrapage and Survival Rates*, Oak Ridge National Laboratory, September 2013. Online at

[http://cta.ornl.gov/data/tedb32/Spreadsheets/Table3\\_12.xls](http://cta.ornl.gov/data/tedb32/Spreadsheets/Table3_12.xls).

*Electric Drive Vehicle Sales Figures (U.S. Market)*, Electric Drive Transportation Association, September 2013. Online at <http://www.electricdrive.org/index.php?ht=d/sp/i/20952/pid/20952>.

*Electric Power Monthly*, U.S. Energy Information Administration, August 2013. Online at

<http://www.eia.gov/electricity/monthly/pdf/epm.pdf>.

*Fuel Economy Information*, U.S. Department of Energy and U.S. Environmental Protection Agency, September 2013. Online at <http://www.fueleconomy.gov/>.

*Half the Oil: A plan to cut projected U.S. oil use in half in 20 years*, Union of Concerned Scientists, June 2013. Online at <http://www.halftheoil.org>.

*Monthly Retail Gasoline and Diesel Prices*, U.S. Energy Information Administration, September 2013.

Online at [http://www.eia.gov/dnav/pet/pet\\_pri\\_and\\_dcus\\_nus\\_m.htm](http://www.eia.gov/dnav/pet/pet_pri_and_dcus_nus_m.htm).

*State of Charge: Electric vehicles' global warming emissions and fuel-cost savings across the United States*, Union of Concerned Scientists, April 2012. Online at

[http://www.ucsusa.org/clean\\_vehicles/smart-transportation-solutions/advanced-vehicle-technologies/electric-cars/emissions-and-charging-costs-electric-cars.html](http://www.ucsusa.org/clean_vehicles/smart-transportation-solutions/advanced-vehicle-technologies/electric-cars/emissions-and-charging-costs-electric-cars.html).

## Assumptions / Approach

To calculate the average cost to drive 100 miles, we compared a model year (MY) 2013 Nissan LEAF that uses an EPA estimated 0.29 kilowatt hours (kWh) per mile and a 27 mile per gallon (mpg) gasoline-fueled compact car. To travel 100 miles, the LEAF requires 29 kWh of electricity and, at the national average residential cost of electricity from January to June 2013 (\$0.119 / kWh), the LEAF's fuel cost is \$3.45. A 27 mpg car consumes 3.703 gallons over 100 miles, and at \$3.65 per gallon of gasoline, the average national gasoline price from January 2013 through June 2013, costs \$13.52 to fuel.

To calculate the average annual fuel savings from an electric vehicle, we relied on findings from our 2012 report, *State of Charge*. The estimated range of annual savings (\$750-\$1200) is based on the electricity cost to charge a MY 2011 Nissan LEAF in the 50 largest cities in the U.S. and assumes 11,000 miles of driving annually. The comparison vehicle is a 27 mpg gasoline vehicle fueled with \$3.50 per gallon of gasoline. For further information about electricity costs and estimated savings by city, see the UCS [State of Charge report](#) for further details.

For electric vehicle sales data, we utilized data from the Electric Drive Transportation Association mentioned above. Electric vehicles, including plug-in hybrids and battery electric vehicles, in 2012 were 52,835 while sales in the previous year amounted to 17,735, representing an increase of 298 percent. Cumulative electric vehicle sales through July 2013 are over 115,000 – with 99% of those sales occurring since 2011. Since scrappage rates for vehicles less than 3 years old are very small, estimated at 1 percent, we assumed the vast majority of these vehicles are still on the road.

Continued investments and policy support for plug-in electric and hydrogen fuel cell vehicles will allow the market share of these technologies to grow significantly over the new two decades. In modeling performed for the UCS *Half the Oil* analysis, sales of electric vehicles (plug-in hybrid, battery electric, and fuel cell electric vehicles) are assumed to make modest gains in market share by 2020, and then begin to increase substantially by 2025, reaching more than 40 percent by 2035. For example, we assumed these vehicles could achieve a 3 percent share by 2020, 10 percent by 2025, and 25 percent by 2030, and 45 percent by 2035. For more on these calculations, see the UCS [Half the Oil plan](#).