

WebMemo



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Economic Realities of the Electric Car

Nicolas D. Loris and David W. Kreutzer, Ph.D.

High gasoline prices and America's alleged addiction to oil give rise to policy ideas to reduce America's oil use, particularly in the transportation sector. Along with fuel efficiency standards and alternative fuel consumption mandates and production tax credits, the government has in place incentives to make and purchase electric cars, including hybrid electric vehicles (HEVs), plug-in hybrid electric vehicles (PHEVs), and battery electric vehicles (BEVs).

But the economic reality is that PHEVs are not ready for primetime, and the best indicator for when they will be is when the government stops using taxpayer dollars to subsidize their production and consumption. Congress should not provide any additional taxpayer-funded incentives for electric vehicles and should repeal the ones already in place. Private industry should be allowed to improve these products to meet the demands of the market.

The Policies. Federal and state governments have implemented a number of policies to spur electric vehicle purchases. The Energy Policy Act of 2005 provides tax credits for approved hybrid gas-electric vehicles purchased between 2006 and 2010, and the American Recovery and Reinvestment Act modified the tax credit for vehicles purchased after 2009 to \$2,500–\$7,500, depending on the battery capacity. The law also included tax credits for plug-in electric drive conversion kits and \$2.4 billion in grants for advanced battery and vehicle manufacturing. Several states have additional consumer rebates for electric vehicles.

The Energy Independence and Security Act of 2007 established the Advanced Technology Vehicle Manufacturing program, a \$25 billion direct loan

program aimed at generating automotive and manufacturing green jobs and reaching the Administration's goal of higher standards for advanced technology vehicles.

The federal government has also announced tighter rules on fuel efficiency that stand to benefit electric vehicles. In April 2010, the National Highway Traffic Safety Administration and the Environmental Protection Agency increased the average fleet-wide fuel economy requirements to 34.1 miles per gallon (MPG) by 2016.

The Projections. Despite the government's best attempt to promote electric vehicles; the market has been reluctant to respond. In the United States, sales of HEVs and PHEVs accounted for only 2.8 percent of vehicles sold in 2009, and that number is expected to drop to 2.5 percent for 2010—less than 300,000 units.¹ This includes the Administration's purchase of nearly one-fourth of Ford and General Motors hybrid vehicles since President Obama took office.²

The long-term projections for hybrids are slightly more promising, but not so for battery electric vehicles. J. D. Power and Associates projects sales of HEVs and PHEVs will reach 1.67 million units by 2020 and account for nearly 10 percent of the market share. BEV sales, however, will make up

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less than 1 percent of all vehicles sold in 2020 at just over 100,000 units.³

Obstacles. The primary reason for low electric vehicle demand is cost. Consumers must pay a premium for electric vehicles with the expectation that the savings in fuel costs will negate the higher sticker price and the electric vehicle purchase will eventually be a money-saver. But consumers are reluctant to pay that premium.⁴

Due to many technological improvements, batteries are now lighter and have greater storage capacity, but still they only have a life expectancy of 124,000 miles and a replacement cost as high as \$15,000. The battery in an electric car must overcome many more technological hurdles before consumers accept electric power as a superior alternative to the internal combustion engine. Battery manufacturers must find an acceptable combination of capacity, performance, durability, size, weight, and cost before the typical consumer will spring for the home recharging station.

Limited battery range is at the forefront of concerns. The Chevy Volt, for instance, receives 93 miles-per-gallon equivalent (MPGe) in electric-only mode, 37 MPG in gasoline-only mode, and a “combined composite” rating of 60 MPG. Advertising 93 MPGe is particularly questionable, since the car can drive in electric-only mode for only 25–50 miles in temperate conditions. Hills and extreme temperature conditions reduce even this moderate range as they put additional strain on batteries. Further, it is difficult to design a battery for optimal performance over a wide range of temperatures. Batteries could be rated for certain climates, but their usefulness

across regions would be minimal. Complete or near-complete battery discharges (using that full range) significantly shorten a battery’s useful life.

An Electric Car Finance Lesson. Even if electric cars save fuel, they still cost more to own than similar gasoline-only vehicles. Edmunds.com lists the market price for a Chevy Volt at \$41,000.⁵ The most comparable gasoline-only vehicle is the Chevy Cruze, which has a market price of \$17,000–\$22,000. The features on the Cruze 2LT, with a price of \$21,000, seem to best match those of the Volt. Going electric costs an additional \$20,000; however, the government narrows this differential through a taxpayer-funded financial credit of \$7,500.

For the Volt, the EPA projects monthly fuel costs to vary between \$50 per month with all electric driving and \$112 when using gasoline only.⁶ Edmunds.com estimates monthly fuel cost for the Volt to be \$54 per month based on likely usage patterns.⁷

The EPA projects that the Cruze will use \$142 of gasoline per month. Though the \$88-a-month savings on fuel might appear substantial, a closer look at the numbers reveals the saving is not worth the higher sticker price, even with a \$7,500 subsidy.

One way of doing the comparison is to calculate how much more a car buyer could afford with the \$88 per month in fuel savings. Using a 5 percent interest rate (similar to new-car finance rates), \$88 per month for 120 months (10 years) would finance an additional \$8,297 at the time of purchase. This is nowhere near enough to pay the \$20,000 premium (\$12,500 with tax credit) necessary to upgrade to a Volt.

1. Angela Greiling Keane and Jeff Green, “Obama Bolsters U.S. Hybrid Automobile Sales in Waning Consumer Market,” Bloomberg, November 23, 2010, at <http://www.bloomberg.com/news/2010-11-23/obama-bolsters-u-s-hybrid-auto-sales-in-waning-consumer-market.html> (December 15, 2010).
2. J. D. Power and Associates, “Drive Green 2020: More Hope Than Reality?” November 2010, at http://businesscenter.jdpower.com/JDPAContent/CorpComm/pdfs/DriveGreen2020_110410.pdf (January 21, 2011).
3. *Ibid.*
4. J. D. Power and Associates, “Drive Green 2020.”
5. Edmunds.com, “2011 Chevrolet Volt Base Price with Options,” at <http://www.edmunds.com/chevrolet/volt/2011/options.html?style=101213142&trim=base> (January 5, 2011).
6. U.S. Department of Energy, “2011 Chevrolet Volt,” at <http://www.fueleconomy.gov/feg/phevsbs.shtml> (January 5, 2011).
7. Jeremy Anwyl, “Monthly Fuel Cost vs. MPG: Edmunds.com’s Letter to the EPA,” Edmunds.com, March 11, 2009, at <http://www.edmunds.com/car-news/monthly-fuel-cost-letter.html> (January 5, 2011).

Comparing Costs: Chevy Volt v. Chevy Cruze

At a base price of \$41,000 the Chevy Volt costs about \$20,000 more than the comparable Chevy Cruze. Even when including a \$7,500 taxpayer-funded subsidy, the monthly costs to purchase a Volt still exceed the savings from buying less gasoline.

Difference in Purchase Price, Volt v. Cruze	Years Financed	Additional Cost per Month to Purchase a Volt, at 5% Interest Rate	Estimated Monthly Energy Savings from Owning a Volt	Additional Cost per Month to Purchase a Volt, After Energy Savings
+\$20,000 (no tax credit)	6	\$322	—	\$234
+\$12,500 (after tax credit)	6	\$201	—	\$113
	10	\$133	—	\$45

Sources: Heritage Foundation calculations.

Table 1 • WM 3116 heritage.org

Even factoring in the environmental benefits by pricing the reduction of carbon dioxide (CO₂) emissions, the Volt is still not a good purchase. Estimates on the price of CO₂ fall in the range of \$5 to \$30 per ton. The Department of Energy estimates that the typically driven Cruze will emit 6.9 tons of CO₂ per year.⁸ Thus, the value of the saved emissions is \$3 to \$17 per month—and that ignores all of the emissions from generating the Volt’s electricity, which may well be greater than the Cruze if the Volt charges with coal-generated electricity.

Kill the Electric Car Subsidies. Electric cars may eventually represent a large percentage of America’s vehicle fleet, but Congress should not force them into the marketplace with subsidies. It is time to end consumer and producer handouts for electric cars and focus on an energy policy that produces affordable electricity.

—*Nicolas D. Loris is a Research Associate in the Thomas A. Roe Institute for Economic Policy Studies and David W. Kreutzer, Ph.D., is Research Fellow in Energy Economics and Climate Change in the Center for Data Analysis at The Heritage Foundation.*

8. U.S Department of Energy, “Find a Car,” at <http://www.fueleconomy.gov/feg/findacar.htm> (January 5, 2011).