



EPA economy ratings vs. the GM Volt: A square peg in a round hole

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What a difference a number makes.

The projected EPA economy rating of the GM Volt has set off a storm of criticism across the Internet. While a number of blogs played the story straight ([1](#), [2](#)), the [Good Math blog](#) attacked it as nonsense, which got picked up by [Reddit](#). Critics say that the actual fuel economy seen by drivers could be as low as 50 MPG (the claimed figure for charge-sustaining mode), or as high as infinity. So who's right?

Basically, they all are. The EPA city-cycle measures the Volt's characteristics about as well as a square peg fits a round hole. In this mess, the number you get depends how you trim the test to fit the car.



By current standards, the Volt is neither fish nor fowl. When starting with a fully-charged battery, it can go a nominal 40 miles without burning a drop of fuel (the AER). After that, it has a nominal rating of 50 MPG. All of this will be affected by weather, driver style, use of air conditioning, and the whole panoply of real-world complications. A feather-foot driving in town may get 60 miles on the battery, a leadfoot may get 20 miles AER and just 30 MPG afterward, and sitting in stalled traffic with the A/C going full blast is going to eat into everything. If you take the EPA city cycle with the provisos agreed between GM and the EPA and measure only the liquid fuel, you get the magic number of 230 MPG.

[Green Car Congress](#) gave a rather straightforward analysis:

Based on the same draft EPA methodology, the Volt would also deliver “triple-digit”

combined cycle fuel economy along with combined cycle electricity consumption of 25 kWh/100 miles, according to GM. At the US average cost of electricity (approximately 11 cents per kWh), GM calculates that a typical Volt driver would pay about \$2.75 for electricity to travel 100 miles, or less than three cents per mile.

From the data we've seen, many Chevy Volt drivers might be able to be in pure electric mode on a daily basis without having to use virtually any gas. EPA labels are a yardstick for customers to compare a vehicles' fuel efficiency. So, a vehicle like the Volt that achieves a combined triple-digit fuel economy is a game-changer...The key to high-mileage performance is for a Volt driver to plug into the electric grid at least once each day.

—GM CEO Fritz Henderson

Since it's obvious that almost nobody would get that 230 MPG figure, or even $\pm 10\%$ of this value, it's worth asking: what does the prospective Volt buyer need to know? Off the top of my head, I can think of this:

1. How much electricity they would use.
2. How often they'd have to visit the gas station
 - using gasoline
 - using E-85
3. Whether plugging in at work, or forgetting to plug in at night, would change those numbers substantially.
4. Whether there are any electric rate plans which would make the car significantly cheaper to own.
5. The overall monthly cost at various fuel prices and electric rates.
6. Comparison with other makes and models.

This doesn't call for a flamewar. This calls for an on-line calculator, perhaps integrated with a mapping service which can project energy consumption on the typical commute, errands such as shopping, and trip to the relatives or the beach. But without adjusting for speed limits, traffic, lead feet and hyper-milers, and even the weather, would anyone still get within 10%? The battle over the numbers does not look to end any time soon.



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