

It is cheaper to drive a mile on electricity than it is to drive a mile on gasoline. Though your electricity costs will go up if you're charging your electric vehicle (EV) at home, your gas costs will decrease more. We've done some math to demonstrate cost savings and found that, by choosing to buy a new all-electric car instead of a new gas-powered car, the average Massachusetts or Rhode Island driver will save 4.2 cents per mile, which amounts to \$500 per year or \$42 per month, in fuel costs. Because the price of gasoline is volatile but electricity prices remain relatively stable, you can expect to save a lot more when the price at the pump swings up.

The Union of Concerned Scientists' cost savings estimate for the entire country is \$770/year. Our estimate for New England is lower than the national average because of the relatively high cost of electricity, low cost of gasoline, and fewer miles driven in New England compared to other regions. [You can access their numbers here.](#)

Considered another way, a new gas-powered car would have to get more than 43 miles per gallon in order to be cheaper per mile than the average new electric vehicle... but the gas-powered car would emit twice as much carbon dioxide. Here's how we arrived at those numbers.

Saving 4.2¢/mile

How much does it cost to drive a mile on electricity?

The average new all-electric car available through the Drive Green program requires about 0.29 kilowatt-hours (kWh) per mile driven, according to the U.S. Department of Energy's [Electric Car Comparison Tool](#). In Massachusetts and Rhode Island, one kWh costs about \$0.20 (including generation, transmission, and distribution). The cost per kWh depends on the time of year because National Grid and Eversource change their rates every six months and rates tend to be lower in the summer. However, \$0.20/kWh is a good average estimate. Multiplying the number of kWh required to drive a mile by the cost of a kWh, we arrive at a cost of **5.8¢/mile** to drive the average new all-electric car as a National Grid or Eversource electric customer in Massachusetts or Rhode Island.

$$\frac{0.29 \text{ kWh}}{\text{mile}} \times \frac{\$0.20}{\text{kWh}} = \$0.058/\text{mile} = \text{cost to drive one mile on electricity}$$

How much does it cost to drive a mile on gasoline?

The average fuel efficiency for new vehicles sold in the United States 24.9 miles per gallon, according to the [2018 EPA Automotive Trends Report](#). According to the [U.S. Energy Information Administration](#), the average retail gasoline price in New England in the last year as of 10/22/2019 was \$2.5/gallon. Multiplying the number of gallons required to drive a mile by the cost of a gallon of gasoline (0.04 gallons x \$2.5/gallon), we arrive at a cost of **10¢/mile** to drive the average new gas-powered car in New England.

$$\frac{1 \text{ gallon}}{24.9 \text{ miles}} \times \frac{\$2.5}{\text{gallon}} = \$0.10/\text{mile} = \text{cost to drive one mile on gas}$$

How much do I save by switching from a gasoline-powered car to an all-electric car?

It costs 10¢/mile to drive a gas-powered car and 5.8¢/mile to drive an all-electric car. The difference (10 – 5.8) is 4.2, so switching to an all-electric car saves the average Massachusetts or Rhode Island driver 4.2¢/mile, *not* including savings from service.

Saving \$500/year or \$42/month

The average licensed driver drives 11,759 miles per year in Massachusetts and 12,781 miles per year in Rhode Island, according to the [Federal Highway Administration](#). We will use the weighted average of these numbers based on each state's population in 2018 for our analysis.

$$11,759 \text{ MA miles} \times \frac{6.89 \text{ million}}{7.92 \text{ million}} + 12,781 \text{ RI miles} \times \frac{1.06 \text{ million}}{7.92 \text{ million}} = 11,896 \text{ average miles}$$

Since switching from a gas-powered car to an all-electric saves the average Massachusetts or Rhode Island consumer 4.2¢/mile, those savings amount to **\$499.63/year** (11,896 miles/year x 4.2¢/mile). Divided over twelve months, that amounts to **\$41.63/month**.

How many miles per gallon would a new gas-powered car have to get to be cheaper per mile than the average new electric car?

Assuming a gas price of \$2.5/gallon (the average retail gasoline price in New England in the last year as of 10/22/2019, according to the [U.S. Energy Information Administration](#)), a car would need to get over 43 miles per gallon to be cheaper to fuel than an all-electric car.

$$\frac{\$2.5}{\text{gallon}} \times \frac{1 \text{ mile}}{\$0.058} = 43 \frac{\text{miles}}{\text{gallon}}$$

(Cost of a gallon of gas / cost of a mile on electricity = MPG required for a gas-powered car to be more cost-effective than an EV)