



2018: THE STATE OF ELECTRIC CARS IN MAINE

In 2018, more than 1,300 Mainers own electric cars—more than twice as many as in 2014. During those four years, electric cars became more affordable and more convenient to drive, as they could travel farther on a charge. In the spring of 2018, the Natural Resources Council of Maine (NRCM) mailed a survey to all registered electric vehicle (EV) owners in Maine to learn about their experiences. NRCM conducted a similar survey in the fall of 2014. We received 430 responses (from 33% of all registered EV owners in Maine), which gives us valuable insight into this transformative clean technology¹.

Cars and trucks are the largest source of climate change pollution in Maine. Maine and New England have one of the cleanest electricity mixes in the country, so driving an electric vehicle here is an absolute win for the environment. Plug-in electric vehicles (both all-electric and plug-in hybrids) are helping Maine people reduce climate-disrupting pollution and at the same time save money they would otherwise spend on gasoline, most of which would leave our state economy.

Key Takeaways:







- Top two reasons Mainers chose to buy electric cars: to reduce air pollution (76%) and save money on gasoline (50%).
- Top reason Mainers *like* their electric cars: Drivability.
- Drivers would overwhelmingly recommend EVs to others (91%) and find them reliable (96%) and easy/affordable to maintain (89%).
- Two-thirds of Maine EV drivers use plug-in hybrids that can operate on electricity or gasoline.
- Most respondents (62%) use their EV for commuting.
- 52% of respondents save more than \$50 per month on gasoline, and an additional 30% save at least \$25 per month.
- Most of the initial concerns EV drivers had when they purchased the car went away after they began driving; however, the twin concerns of battery range and availability of charging stations remain important.
- 87% of electric car owners primarily charge their cars at home. They also use public charging stations, more so than in 2014.
- Utilities and the Public Utilities Commission can do more to guide EV drivers to charge their cars in ways and at times of day that will reduce electricity rates for everyone.



¹ While we cannot draw complete conclusions from a non-randomized response, the fact that we collected data from such a large portion of EV drivers in Maine means the information should be highly valuable. The two NRCM surveys are the only comprehensive surveys of EV drivers conducted in Maine to-date.

The Cars

There is an array of plug-in electric car models on the road in Maine today. Some are fully electric (sometimes called “Battery Electric Vehicles”) and some run partially on electricity but have a gas tank as well, called “Plug-in Hybrid Electric Vehicles.” All of them can be plugged in to charge a battery. Below are the top EVs that Mainers are driving:

ALL-ELECTRIC 30% of registered EVs in Maine	Nissan Leaf  RANGE: 150 battery miles 13% of Maine EVs	Chevrolet Bolt  RANGE: 250 battery miles 5% of Maine EVs	Tesla Model S  RANGE: 250 battery miles 6% of Maine EVs
	Chevrolet Volt  RANGE: 53 electric miles + 367 gas miles 20% of Maine EVs	Ford Fusion  RANGE: 21 electric miles + 589 gas miles 16% of Maine EVs	Toyota Prius Prime  RANGE: 25 electric miles + 615 miles gas 13% of Maine EVs
Other all-electric and plug-in hybrids in Maine include: Ford Focus, Honda Clarity, Volvo Xc60, VW Golf, Hyundai Ioniq, Smart Passio, Chrysler Gem and Pacifica, Kia Soul, BMW i3, Tesla Model X, and more			

EV sales are increasing rapidly in Maine: 470 EVs were sold in Maine in 2017, compared to 192 in 2014. However, Maine lags behind the national average in EV sales per capita, especially in all-electric models.

Nearly two-thirds of respondents drive their electric cars to work, and 30% of those commutes are more than 20 miles each way.

About 70% have an additional car in the household (22% only own an EV).

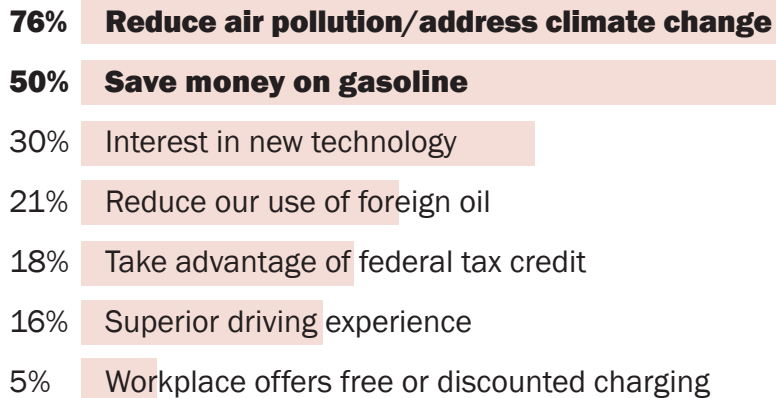
One-third of the Mainers drive their EV 10,000–14,000 miles per year, which is the typical number for all Maine drivers; 20% drive more and 45% drive less.

EV Drivers' Distance to Work Commute

<10 miles 40%	11-20 miles 29%	21-50 miles 26%	50+ miles 5%
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The Drivers

Respondents identified the top two reasons they purchased an electric car:



What Mainers like most about their electric cars is the **driving experience** (39%); they say the cars are quick, responsive, and handle well. They also especially like the **low environmental impact** (36%), the **quiet ride** (33%), and **using less or no gas** (20%). The biggest dislikes are the battery range (31%) and reduced range in the winter (13%).

The Transition to Electric Cars

Although electric cars have substantial advantages, driving gasoline cars and going to the gas station are ingrained into most of our lives. Knowing that it takes time for consumers to understand what this new technology means for them, we asked EV drivers what concerns they had at first, which persisted, and which went away after they started driving them.

Most concerns largely disappeared after they began driving electric. These include the cost of charging, using charging equipment, the upfront cost of the car, resale value, and maintaining the car affordably.

The biggest concern of EV drivers that persisted after they began driving was the availability of public charging stations (47%). A second and related concern was not having enough battery range to get where they wanted (39%). Fortunately both of these concerns are likely to diminish as battery ranges increase and Maine invests in additional publicly available charging stations, starting with the deployment of \$3.5 million from a settlement with Volkswagen.



What Maine EV drivers are saying:

96% find their electric car to be “reliable”

89% said it was “easy and affordable to maintain” (only 2% said it wasn’t)

92% would recommend electric cars to their friends, family, or colleagues

84% notice reduced battery range in colder temperatures (of those, a majority estimate a decrease of 10-25%)

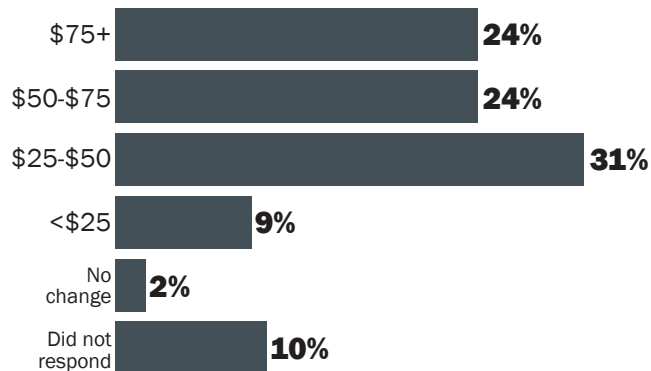
Saving Money & Reducing Pollution

Saving money on gas was one of the top reasons respondents chose to purchase an electric car in the first place, and it has paid off. Half of drivers report saving at least \$50 per month; a quarter of them are saving more than \$75 per month. All-electric drivers are more likely to report larger savings.

On the other hand, driving an electric car does not significantly increase electric bills for most drivers—hence driving is simply cheaper! Forty percent of respondents said their electric bill had gone up \$10 per month or less, with 20% seeing increases of \$10-20/month.

The Union of Concerned Scientists calculates that driving an all-electric EV in Maine results in the same carbon pollution as driving a gasoline car that gets 107 miles per gallon². As our electricity mix continues to get cleaner, driving cars powered by electricity instead of gasoline will reduce air pollution even more.

Individual gas savings/month



Vehicle Charging

Mainers are overwhelmingly charging their electric cars at home, with 87% of respondents indicating that their “primary” charging place was at home. About half of all EV owners have a Level 2 charger at home, although 75% of all-electric owners have one. About 9% of primary charging is done at a workplace. The most common “secondary” place for charging is a public charging station (10%), generally at the Level 2 level.

Mainers are using public charging stations now more than ever. Between 2014 and 2018, the number of respondents who had used public charging more than five times/year increased from 6% to nearly 20 percent. In 2018, 50% of EV owners had not used a public charging station at all, down from 67% in 2014.

Along with home charging, 68% charge their vehicles overnight, which is both convenient—it means having a full “tank” every morning—and good for maintaining a lower-cost electricity grid. However 25% report charging “often” or “mostly” during the day (either at home or work), and only 5% are actually using time-of-use rates to benefit from cheaper nighttime costs.

Finally, a full third of respondents said they have solar panels where they charge their EV (i.e., mostly at home).

What are the different chargers?

Level 1 charging is done via any standard 120 V plug. It’s the slowest way to charge your car, but in a pinch it will do the trick.

Level 2 chargers, sold separately from an electric car, hook up to the kind of plug you might use for an electric stove or a clothes dryer. They charge faster than Level 1 chargers.

Level 3 chargers, also known as Direct Current Fast Chargers (DCFCs), are the fastest way to charge your car. You can charge your car while you eat lunch!

² Union of Concerned Scientists. “How Clean is Your Electric Vehicle?” Available at www.ucsusa.org/clean-vehicles/electric-vehicles/ev-emissions-tool

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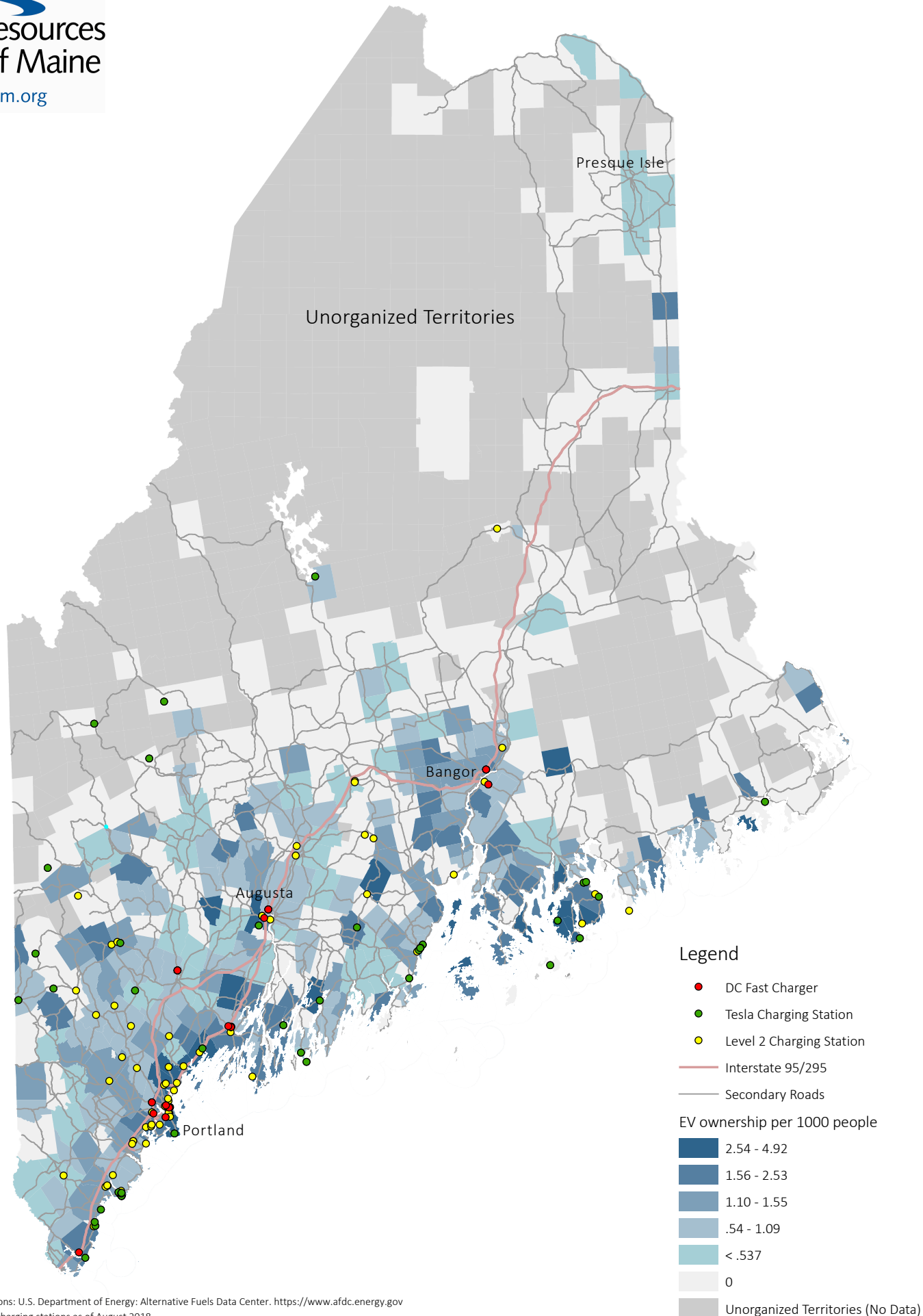
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Maine Electric Car Owners



Infosource:

Public Charging Stations: U.S. Department of Energy: Alternative Fuels Data Center. <https://www.afdc.energy.gov>

Map displays public charging stations as of August 2018

Population Data infosource: U.S. Census Bureau

Vehicle Registration: Maine Bureau of Motor Vehicles, May 2018