



Battery Electric Vehicle FAQs

Electric Vehicle definition: What is the difference between Battery Electric (EV), Plug-in Hybrid, and Hybrid Electric?

These terms can be confusing. Let's sort them out this way: Battery Electric vehicles, commonly called EVs, are just what they sound like. All their power comes from a large, rechargeable battery pack, which is recharged by plugging the EV into an electrical power source.

Plug-in Hybrids have a combustion (usually gasoline) engine, plus a large battery. That battery can be recharged by plugging into an electrical power source. Or the battery can be recharged while the vehicle is being driven, powered by its gasoline engine.

Hybrid Electric vehicles have both a large battery and a gasoline engine. The battery in these vehicles can only be recharged by running the gasoline engine.

EVs cost way more, don't they?

Right now, a new EV does cost more to buy than a comparable gasoline car, although state and federal tax incentives can offset much if not all of this price difference. However, EV operating costs are far less. The per mile cost to recharge an EV is about one-third that of refueling a gas car. Predicted maintenance costs are far less. Remember how few moving parts an EV has? No oil changes, antifreeze, or engine repairs; no new mufflers to buy. A recent [Consumer Reports article](#) estimates that savings over the lifetime of the vehicle range from \$6,000-\$10,000.

What if the battery doesn't last and I have to spend \$\$\$ to buy a new one?

All batteries slowly lose their storage capacity over time, which is why federal regulations require manufacturers to warranty battery performance for at least 100,000 miles or eight years. Many manufacturers offer even longer warranties. Thanks to technological advances, batteries will continue to last longer, cost less, and shrink in size and weight.

What about the extra registration fees for EVs?

Battery-electric cars don't pay the gas taxes used to build and maintain our highways. Instead, EVs pay an extra annual fee of \$225 in Washington State. If you drive your EV quite a bit, the fee will be less than what you would have paid in gas taxes. If you don't drive much, you'll be paying more. As electric vehicles become more common, the state is considering moving toward some form of VMT (vehicle miles traveled) fee to raise transportation revenue in place of the gas tax.

What would it cost to install a charger at my house?

It may not be necessary. Many people charge on a regular 110 volt outlet with the cord that comes with the car. Some people can charge at work. If you'd prefer to charge faster at home using a 220 volt outlet (such as the one used by electric clothes dryers), the cost will depend on a number of factors:

If you have an existing 220v outlet, a basic charging cable and plug that hangs on the wall in your garage can cost less than \$300.

Whether you're using an existing outlet or installing a new one, check to make sure your electrical panel can provide enough current (amps) to charge efficiently. Having an electrician install a new 220v circuit in a relatively new house might cost \$500-\$600.

I'm worried the battery will go dead while I'm driving.

Just like a gas gauge, an instrument panel provides an up-to-date estimate of your remaining range.

Running out of battery power is about as likely as running out of gas with a gas-powered vehicle, maybe less so because the instrument panel measures variables that will affect your range, including speed, terrain, and weather.

What about long distance trips?

The car's navigation software and a variety of smartphone apps locate chargers for you, including the 440v fast chargers along highway corridors and at major commercial centers. These will restore 80% of your car's range in less than an hour. Some chargers are free, but most require a payment. Crowd-sourced [Plugshare](#) is the most comprehensive and accurate website and app for finding chargers while you're traveling.

There are three different kinds of fast chargers: Tesla, CHAdeMO (ChAdeMO is the trade name of a quick charging method for battery electric vehicles used by Japanese manufacturers such as Nissan and Mitsubishi), and Combined Charging System (CCS). Tesla's charging network will only work with their cars, though Tesla owners can adapt their charger to work with the second kind, CHAdeMO. And Tesla is quickly adopting the third kind, CCS which is used by American and European manufacturers. Nearly all up-to-date fast chargers offer both CHAdeMO and CCS, much like regular gas and diesel dispensed at the same pump.

Fully charging a typical EV with a battery capacity of 35-40 kWh costs about \$10 at a public charger. Charging networks vary in how they bill customers; some have a one-time access charge and some charge by how long you're at the charger. Most now charge you just for the actual energy you use. Nearly all charging stations now use regular credit and debit cards like a gas pump.

Just as with a gasoline vehicle, your driving range will vary depending upon speed, terrain, weather, and the capacity of your batteries. The instrument panel measures these variables and provides an up-to-date estimate of your remaining range.

You can read about one EV owner's recent roundtrip visit to the Bay Area: thurstonclimateaction.org/2020/07/22/an-electric-vehicle-travelogue-yes-ev-road-trips-can-be-a-fun-adventure/

What do I need to do to maintain my EV?

Very little; rotate the tires, occasionally check fluid levels (battery coolant, power brakes, power steering, windshield wiper fluid), clean leaves out of air vents, replace windshield wipers. That's it!

EVs are new technology, so isn't there a lot more that can go wrong?

Actually, the earliest cars were electric, but the batteries in the early twentieth century wouldn't take them very far on a charge. Thanks to lithium ion batteries, EVs have made their way back into the marketplace over the last decade. What's more, there are only about 20 moving parts on an EV while there are around 2,000 on a gas vehicle! We are accustomed to things breaking on a gas vehicle, and to having to take it to a mechanic. There is much less to break and maintain on an EV!

Isn't the electric grid just as dirty as using gas?

In our area, Puget Sound Energy relies on renewable energy sources, primarily hydroelectric and wind power, to meet roughly one-third of consumer demand. PSE will be coal-free by 2025, and completely fossil fuel-free by 2045. Right now, you'd need to get 100 mpg on a gas engine car to equal the efficiency of an EV.

What should I consider when looking for an EV to replace my conventional car?

Think about your actual driving needs. Many current EVs will go well over 200 miles between charges. If you can recharge at home, in your garage or driveway, “refueling” is simple and cheap. If your driving habits include longer trips, consider whether stopping at a public charging station would meet your needs - or even if occasionally renting a conventional car would enable you to make this change that benefits our planet.

Won't an EV get smashed to bits in an accident?

No! EVs are required to have the same safety features as conventional cars. Modern EVs aren't glorified golf carts; they are serious, well-designed, roadworthy vehicles. There's no leaking gasoline in the event of a serious crash, either.

Will I get shocked if I drive through a puddle or go through a car wash in my EV?

Absolutely not! Electric vehicles go through the same rigorous testing process as gas vehicles before they're made available to buyers, and are just as watertight and safe as any gas car in wet conditions, be it a car wash, torrential rains, or snowstorm.

Are Electric Cars more flammable?

Lithium-ion (Li-ion) batteries, the power source for battery electric vehicles, are flammable. They contain a liquid electrolyte that stores energy and can overheat and combust with prolonged exposure to the wrong conditions. These power cells are also subject to short-circuiting if they are damaged, and those short-circuits can result in fires if the proper safety precautions are not in place. However, when compared to the flammability of gasoline, Li-ion batteries pose a far lower risk of fire or explosions.

Where can I learn more about these cars?

If you're interested in more details about these or other current plug-in cars, here are a few websites that let you compare them in a variety of helpful ways.

Forth has glossy online guides that give an overview of all the currently available EVs and plug-in hybrids. (forthmobility.org/showcase/ev-models)

Plug-In America's Shopping Assistant asks some questions about how you'd use a car, and then gives you information about suitable options and an estimate of the costs for acquiring each of them with cash, a loan, or a lease. (plugstar.com/cars)

The Sierra Club's Electric Vehicle Guide has less information about pricing (just the manufacturer's suggested retail price minus available incentives), but it provides estimates for savings in fuel and fuel costs, and for emissions reductions. (content.sierraclub.org/evguide)

The Costco Auto site shows you current manufacturers' incentives and loan offers. (www.costcoauto.com)

The Department of Energy's Alternative Fuels Data Center's Vehicle Cost Calculator lets you get closer to genuinely local estimates and conveniently compare vehicles in a variety of ways. (afdc.energy.gov/calc)