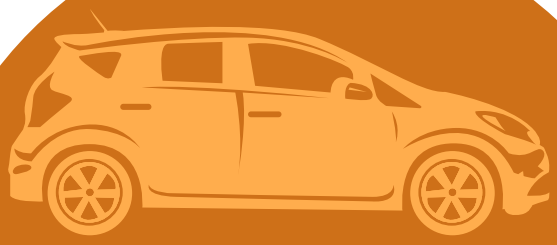
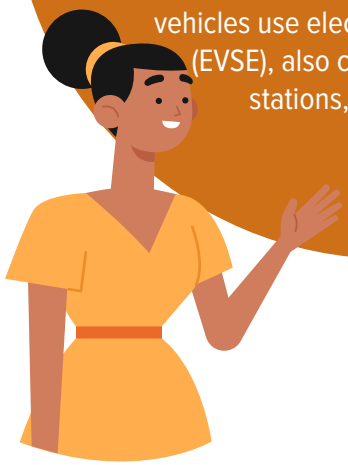
Know your EV facts!

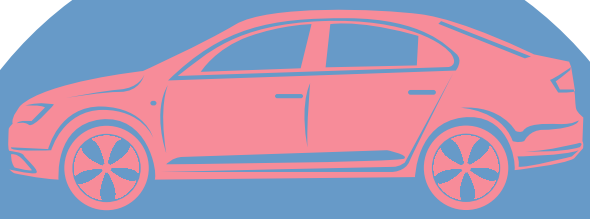


EVs
(or All-Electric Vehicles)

All-electric vehicles get their power from an electric motor that is powered by an onboard battery. These vehicles use electric vehicle supply equipment (EVSE), also called electric vehicle charging stations, to charge their battery.



New EVs have an average range today of 250 miles on a single charge. Some EVs have ranges up to 600 miles on a single charge.



PHEVs
(or Plug-in Hybrid Electric Vehicles)

Plug-in hybrid electric vehicles are powered by both an electric motor *and* an internal combustion engine (ICE). An EV charging station powers the electric battery that runs the electric motor, and gasoline powers the internal combustion engine.

PHEVs have a 20- to 40-mile range when in all-electric mode.

Charging!

Level 1

A Level 1 charger uses a typical home 110V outlet to charge an electric vehicle's battery.

2-5 miles of range per hour of charging

Level 2

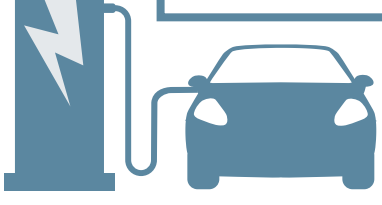
A Level 2 charger uses a 240V outlet, the type of outlet that your electric clothes dryer is plugged into at home, to charge an electric vehicle's battery.

10-40 miles of range per hour of charging

DCFC

A DC Fast Charger provides a direct current (DC) of high voltage electricity to the vehicle's battery.

200-400 miles of range per hour of charging



There are three main power levels of EV charging.

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Frequently Asked Questions

Can EVs drive far enough to be practical?

The average American drives no more than 40 miles per day. Most electric vehicles (EVs) have a range of 150-370 miles, with an average range of 250 miles per full charge, and this is quickly growing[1]. Comparatively, internal combustion engine (ICE) vehicles can travel about 400 miles on one tank of gasoline.

Are EVs reliable?

Yes! EVs will last as long or longer than ICE vehicles with less regular maintenance required. Since there are significantly fewer moving parts in an EV compared to an internal combustion engine (ICE) vehicle, less ongoing preventative maintenance is needed. If the vehicle is an all-electric vehicle (EV), it requires no oil changes, tune-ups, or new spark plugs. If the vehicle is a PHEV (plug-in hybrid electric vehicle), the maintenance on the gas engine is usually negligible.

Brake life is extended on all EVs thanks to regenerative braking, where the motor is used to slow the car, recapturing the kinetic energy from the total mass of the vehicle and storing it in the battery. Electric motors are extremely simple and durable and last hundreds of thousands of miles, even outlasting the body of the vehicle. EVs are also more likely to start in the freezing cold than an ICE vehicle.

Aren't EVs expensive?

Sometimes, the upfront cost of an electric vehicle is more expensive than that of a comparable ICE vehicle. However, battery prices are dropping rapidly, and we expect to see cost parity within the next five years. More importantly, when looking at the total cost of ownership over the life of a vehicle, including purchase, rebates, fuel costs, and maintenance, EVs are less expensive over their lifetime than ICE vehicles. Used EVs are another increasingly popular option and are often more affordable.

How much does it cost to charge an EV?

Most EV batteries require 30 kilowatt hours (kWh) per 100 miles of range added to the battery. In Minnesota the average cost of one kWh is 16 cents for a residential rate; nationally, the average cost of a kWh at residential rate is 15 cents. Currently, you can expect to spend between 25-50 cents per kWh at a public Minnesota DC Fast Charger.

So, if you drive 300 miles, 90 kWh would be needed to charge the battery. If we use the residential rate of 16 cents, it will cost just $14.40 to fully charge the battery. If we use 25 cents per kWh as our rate, it will cost around $23.

In comparison, assuming a high efficiency 30 miles per gallon (mpg) and a 13-gallon tank for the average ICE vehicle today, if you drive 300 miles in an ICE vehicle and gas is $3.99, it would cost about $40 to fill the tank.

What maintenance does an EV need?

There are only around 20 moving parts in an all-electric engine, compared with nearly 2,000 in an ICE vehicle. So, your EV will need a lot less maintenance. You won't need a tune-up, oil change, belt replacements, or spark plugs—ever. Reduced maintenance needs mean the typical EV driver saves over $4,600 in maintenance and repair costs over the lifetime of their vehicle when compared to a similar ICE vehicle.

How can I find a public charging station near me?

There are several apps that you can use to locate public charging stations near you. A popular consumer app is called PlugShare.com. Another popular one is the Alternative Fuels Data Center Station Locator, https://afdc.energy.gov/stations.

Do EVs really emit less carbon than ICE vehicles?

Yes, it is true! In addition to having no tailpipe emissions, after 19,000 miles EVs and their associated electricity use have lower lifecycle emissions than ICE vehicles and their fuel use.[2]

Where do the batteries from EVs end up? Are they recycled?

EVs have two needs when it comes to electricity use: (1) movement of the vehicle, and (2) everything else—dashboard lights, headlights, radio, on-board navigation systems, etc.

Large battery packs, typically lithium-ion batteries, provide the electricity needed to move the vehicle, while a traditional 12-volt battery that you would see under the hood of most ICE vehicles provides the electricity needed to run everything else. So, when discussing EV batteries, although there are typically two sets of batteries in an EV, most people are referring to the large battery packs that move the vehicle.

It is illegal to dispose of EV batteries in a landfill, and their inherent value also ensures that they are recycled. EV batteries can even be used for other purposes after they are no longer usable in an EV. For example, these batteries can be given a "second life" and used to store energy, either as a home battery system or for the electric grid.

1 "U.S. EV Info List," Shift2Electric, June 2022.
2 "Life Cycle Analysis Comparison," Fuels Institute, January 2022.