



# It's time to get **CHARGED UP** about Electric Vehicles!

**Electric Vehicles aren't just the future anymore.  
They are here and they are now...**

Whether you're a savings seeker, technology curious, or a green champion, electric vehicles can provide what you are looking for, and, they are fun to drive.

# WHY CONSIDER AN ELECTRIC VEHICLE?

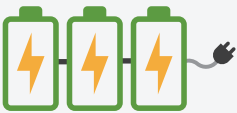
With more positives to owning an Electric Vehicle (EV), this could be the year you go electric. More models, improved performance and the fact that they are FUN to drive are all good reasons to make the switch. Electric vehicles have lower operating costs, lower maintenance costs, and many models are still eligible for tax credits. Even though EVs have a higher initial vehicle cost, they have a lower cost of ownership over the lifetime of the vehicle. As the charging network in America grows, EVs are not only becoming more affordable, but also more convenient to charge:

- ✓ Because they use little or no gas, these vehicles minimize or even eliminate trips to the gas station. With a Battery Electric Vehicle (BEV) or Plug-In Hybrid Electric Vehicle (PHEV), you can instead enjoy the convenience of plugging in at home overnight while you sleep.
- ✓ Because PHEVs (in all-electric mode) and BEVs produce no tailpipe emissions.
- ✓ Because electricity is a domestic energy source and using it in vehicles means that America relies less on imported fuels.
- ✓ Because electric motors respond instantly providing full torque from standstill, electric cars typically accelerate far faster and smoother than gas-powered cars.

## TYPES OF ELECTRIC VEHICLES



**PLUG-IN HYBRID ELECTRIC VEHICLES (PHEV)** When PHEVs are charged overnight, the first miles driven are all electric. When the battery is depleted, the internal combustion engine kicks in and there is no range limitation. This type of vehicle can be a good choice for people who only want one car and want more flexibility. They will not achieve maximum fuel economy or take full advantage of their all-electric capabilities without plugging in and charging the battery.



**BATTERY ELECTRIC VEHICLES (BEV)** BEVs run on electricity alone. They are powered by an electric motor that uses energy stored in a battery (larger than the battery in a PHEV). BEV batteries are charged by plugging the vehicle into an electric power source and (to a lesser degree) through regenerative braking. Most BEV charging is done at home overnight so you wake up to a fresh battery every day. Range varies depending on the make and model of BEV.

# WHAT IS THE COST AND AVAILABILITY OF THE MODELS IN OUR AREA?

The selection of Electric Vehicles (EV) and hybrids has never been greater. The availability in our area is currently more limited, but as interest in EVs continues to grow, more models are entering the market every year and availability is expected to grow. Here is a resource to find a current list of EVs and price ranges available in the Midwest area and the United States.

 Visit [www.EVInfoList.com](http://www.EVInfoList.com) to learn more.

Electric Vehicles can be a higher upfront cost when compared to gasoline vehicles, but as the price of batteries goes down that gap will continue to close. When you factor in the low maintenance requirements, reduced fuel costs, and tax credits still available for most models, EVs usually have a lower cost of ownership and are a better choice.

## WHERE CAN I CHARGE MY VEHICLE?

Most of the charging happens at home because it is the most convenient and affordable way to charge. Public charging is available when you are on the road or if your workplace happens to provide workplace charging.



**CHARGING AT HOME** Home charging accounts for about 85% of all charging done by EV drivers. This is why it's important to understand the solutions available. Level 1 charging at home is available using a standard 120V plug and works well if you drive less than 30 miles per day. If you drive more miles than that, a Level 2 charger might be a better option for you. Level 2 chargers can charge up to seven times faster than a Level 1 charger depending on your vehicle type. They require a 240V source of electricity, like an electric dryer, so you may need to consult an electrician about installing a 240 volt supply near where your car is parked.



**CHARGING IN PUBLIC** Level 2 and DC Fast charging are usually used in public charging. To charge at a public charge station, you will need to know the type of charge station and plug available. According to the U.S. Department of Energy, there are currently more than 24,000 public electric vehicle charging stations across the country, and public charging infrastructure is growing rapidly. Drivers can use apps like the PlugShare Trip Planner feature to plan a road-trip with your electric vehicle and easily view all the best charging locations along the way. To check the availability in your area, visit these websites:

 Visit [www.afdc.energy.gov](http://www.afdc.energy.gov) & [www.plugshare.com](http://www.plugshare.com) to learn more.



**WORKPLACE CHARGING** Some employers provide electric vehicle charging to increase the convenience of driving electric. Visit this website for ideas on ways to encourage your employer to provide EV charging if they don't already.

 Visit [www.workplacecharging.com](http://www.workplacecharging.com) to learn more.

# CHARGING LEVELS

Electric Vehicle charging stations are also called Electric Vehicle Supply Equipment (EVSE). There are three major charging levels.

## LEVEL 1

**2–5 MILES  
PER HOUR OF CHARGING\***

**120 V AC plug**

*Does not require installation of additional charging equipment.*

**Level 1** Charging is done with the cord that is provided when you purchase the car. These chargers can be plugged with one end into any standard 120V outlet, with the other end being plugged directly into the car.

### POWER OUTLET



120 V

### VEHICLE PORT



J1772

## LEVEL 2

**20–80 MILES  
PER HOUR OF CHARGING\***

**240 V plug (residential)**

**208 V plug (commercial)**

*Requires installation of additional charging equipment.*

**Level 2** EVSEs are sold separately from the car. They can be hard-wired or plugged into a 240V outlet. The other end uses a standard SAE J1772 plug which allows charging three to seven times faster than Level 1 charging depending on the car. They usually are installed by an electrician.

### POWER OUTLET



Nema 14-50

### VEHICLE PORT



J1772

## DC FAST CHARGER

**40 MILES  
PER 10 MINUTES OF CHARGING\***

**480 V AC input**

*Rate of charge depends on type of car and charger amperage.*

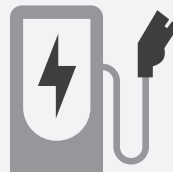
**208 V plug (commercial)**

*Requires installation of additional charging equipment.*

**DC Fast Chargers** are typically used for public charging and they are much faster than Level 2 (AC) chargers. Charging times are dependent on the battery size and the output of the charging station. Other factors like temperature of battery and state of charge will offset the charge time. Usually people spend 30-50 minutes at a DC Fast Charge EVSE but that time will get shorter in the future.

**Tip:** DC Fast Charge is available in most new Battery Electric Vehicles (BEV)s however the rate of DC fast charging can vary greatly (50kW-300kW). Make sure to ask the capability of the vehicle you are considering.

### POWER OUTLET



DC Fast  
Charger

### VEHICLE PORT



J1772 Combo



CHAdeMO




Tesla

\*Range depends on vehicle, speed, cargo weight, and heating and AC use.

## HOW MUCH DOES IT COST TO CHARGE?

As mentioned before, most EV charging is done at home. On average EVs get three miles per kilowatt-hour (kWh) (100 MPGe\*). If you drive 1,000 miles per month you use about 333 kWh of electricity. The average electricity cost in this area is about \$0.12/kWh, so your electricity costs for driving are about \$40 per month for 1,000 miles per month. An internal combustion engine vehicle that gets 25 miles per gallon of gas would use about 40 gallons of gas for driving 1,000 miles per month. If we assume that gas costs \$2.50 per gallon, then your monthly gas costs are \$100. If you drive a thirsty truck getting only 10 MPG, you use 100 gallons of gas in a month and using same gas price, your monthly gas costs are \$250.

Be sure to check with your utility provider for electric vehicle rates and program availability.

 Visit [www.MNEVBuyer.com](http://www.MNEVBuyer.com) to learn more about the economics of driving an electric vehicle.

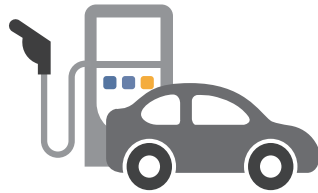
\*Miles per gallon equivalent.

### YOUR ANNUAL COSTS

Plug In vs Fill Up



**ELECTRIC VEHICLE**



**GASOLINE-POWERED VEHICLE**

Your cost to power an all-electric vehicle

**\$480**

Your cost to fuel a gasoline vehicle

**\$1,200**

Assumes 12,000 miles per year, an average of 0.30 kilowatt-hours per mile, \$0.12 cents per kilowatt-hour, 25 miles per gallon at \$2.50 per gallon.

## HOW FAR CAN I GO ON A CHARGE?

Just as gas-fueled cars can go different distances on a gallon of gasoline, how far you can drive your EV with one kilowatt-hour of electricity depends on the car, how you drive it, and other features you are using, such as heating. The median range of how far it can go on a full battery for 2019 EVs was 236 miles.

\*Based on EPA estimated fuel economy for 2019 EV models

# DECISION MADE?

Check with your local utility for any special rates or programs.

## CHARGE

POWERED BY CO-OPS



3366 Bridge Ave  
Albert Lea, MN 56007  
[www.fmec.coop](http://www.fmec.coop)  
800.734.6421  
info@fmec.coop



31110 Cooperative Way  
Rushford, MN 55971  
[www.mienergy.coop](http://www.mienergy.coop)  
800.432.2285



1775 Lake Shady Ave S  
Oronoco, MN 55960  
[www.peoplesenergy.coop](http://www.peoplesenergy.coop)  
800.214.2694  
chargeEV@peoplesenergy.coop



1908 14th St NE  
Austin, MN 55912  
[www.austinutilities.com](http://www.austinutilities.com)  
507.433.8886  
talk2au@austinutilities.com



208 S Walnut Ave  
Owatonna, MN 55060  
[www.owatonnautilities.com](http://www.owatonnautilities.com)  
507.451.2480



4000 E River Rd NE  
Rochester, MN 55906  
[www.rpu.org](http://www.rpu.org)  
507.280.1500  
rpumarketing@rpu.org