

Residential EV Charging Installation Guide



Electric Vehicle Program

[AmerenIllinois.com/EV](https://www.AmerenIllinois.com/EV)

Welcome _____ 3

Introduction 3

Charging Overview _____ 4

Defining EVSE (Electric Vehicle Supply Equipment) . 4

Types of Charging Equipment 4

Level 1: Easy 4

Level 2: Faster 4

On the Road Charging 5

Connectors and Plugs..... 5

Summary Table..... 6

Benefits of At-home Charging 6

At-Home Charging Considerations _____ 7

Location..... 7

Choosing Location 7

Can I Charge Here? 8

Equipment Styles 9

Smart or Basic 10

Efficiency 10

Warranties 10

Cost 10

Cost to Charge 11

EV Rate Program 11

Power Smart Pricing 11

Maintenance Cost 12

Incentives..... 12

Equipment Installation _____ 12

Timeline 12

Permits..... 13

At-Home Charging Checklist _____ 13

Determine Needs..... 13

Conduct a Power Assessment 14

Determine Location 14

Research Charging Equipment and

Apply for Incentives 14

Install Equipment 14

Enroll in the EV Rate Program..... 14

Plug In and Charge!..... 14

Conclusion _____ 15

Resources _____ 15

Interested in Workplace Charging? ____ 15

Interested in Charging at Apartments? __ 15

A Guide for New Electric Vehicle Owners



Welcome

Ameren Illinois is your electric vehicle (EV) resource. EVs are increasingly showing up in our service territory, and Ameren Illinois is here to help ensure you are ready to charge your EV at home!

As part of our commitment to making the transition to driving electric as easy as possible for our valued customers, Ameren Illinois has created this charging guide to help you understand what you need to know about charging your EV at home. Topics to be covered include different types of charging equipment, benefits of charging at home, and installation considerations including potential costs.

For even more information about electric vehicles and to access additional resources, visit [AmerenIllinois.com/EV](https://www.ameren.com/illinois/EV).

Introduction

Data shows over 80%¹ of EV charging happens at home because it is often most convenient and least expensive. There are at-home charging solutions for both plug-in hybrid (PHEV) and all-electric vehicles (BEVs) and, depending on your driving needs, daily charging may not be required. This guide covers at-home charging options for drivers with a carport, garage, driveway, or other dedicated parking space. Helpful tips for EV owners living in apartments is provided at the end of the document.

¹ <https://www.ameren.com/illinois/business/electric-vehicles/rate>

Charging Overview

Defining EVSE (Electric Vehicle Supply Equipment)

EVSE (Electric Vehicle Supply Equipment), commonly known as “charging stations, charging equipment, or chargers,” is the equipment used to safely supply electricity to an EV from a power source. Electric Vehicle Supply Equipment communicates with the EV to ensure safety for the user and vehicle. Electric Vehicle Supply Equipment can be installed at residences, workplaces, retail, public places, and fleet facilities. The speed at which an EV charges depends on several factors including: the vehicle specifications, outdoor temperature, battery charge percentage, as well as the EV’s power supply’s type and power level.

Types of Charging Equipment

There are three types of electric vehicle supply equipment, two of which are available for at-home charging: Level 1 and Level 2.

Level 1: Easy

Level 1 charging uses a standard 120-V outlet and typically provides about four to five miles of range per hour of charge. Most EVs include a cord for Level 1 charging with purchase. If desired, a dedicated Level 1 charger can be installed, though access to a standard wall outlet is adequate in most cases. These chargers use a similar amount of power as a blow-dryer.

Level 1 is best for drivers who:

- have access to workplace charging;
- mostly travel short distances (25-50 miles per day);
- have the ability to let the vehicle charge for more extended periods; and
- have access to a standard outlet that can safely handle the task.

Level 2: Faster

Level 2 charging uses a 240-V circuit and typically provides about 25 miles of range per hour or a full charge for BEVs in four to eight hours. These chargers are typically offered in “plug” style and hardwired versions. Professional installation of hardwired chargers or the 240V NEMA outlet for the plug style version is recommended. However, access to an existing unused 240-V outlet (used to power a large appliance such as a dryer or range) may be appropriate.

Please note, Level 2 chargers are a standard type of connector that will work with any EV (including Teslas with an adapter). This will be described in the Connectors and Plugs section below.

Level 2 is best for drivers who:

- drive longer distances;
- require a faster charge;
- may require a range of 100-200 miles in one charging session; and
- have access to a 240-V circuit (or can have one installed).

On the Road Charging

When you find yourself in need of a charge away from home, you will most commonly have access to Level 2 chargers (the most widely available public charging) and DC Fast chargers. DC Fast chargers typically provide up to an 80% charge in about 30 to 45 minutes. (The exact charge and time will depend on the vehicle and battery size.) With over 600² public charging stations across Illinois, and many more coming, finding charging stations along your route at public and retail locations is getting easier. The vehicle's navigation and apps such as [PlugShare](#) and [Open Charge Map](#) can quickly locate available charging stations and even help you plan a route with access to DC Fast charging along the way.

Connectors and Plugs

Any vehicle can use Level 1 and Level 2 charging as the connector type is standardized. Since all major manufacturers support this standard (Tesla provides adapters for use with SAE J1772), there is no need to be concerned about compatibility with the various charging stations.

Note: Currently, Tesla has a proprietary connector type that other EVs are unable to connect to. However, Tesla is in the process of equipping some Supercharger stations to integrate with non-Tesla electric vehicles.






Tesla owners have access to accessory adapters and can utilize SAE J1772 and CHAdeMO plugs.

Though Level 1 and 2 are universal, DC fast charging varies by make - stations feature different connectors to support all vehicles. Different manufacturers use different plug types for fast charging including the CHAdeMO (used by Nissan through 2020) and Combined Charging System (CCS) (used by most automakers).






2 <https://chargehub.com/en/countries/united-states/illinois/chicago.html>

Summary Table

| Level | Voltage | Charge Rate | Connector |
|-----------------|---------|--------------------------|---|
| Level 1 | 120V | ~5 miles per hour |  |
| Level 2 | 240V | ~up to 25 miles per hour |  |
| DC Fast Charger | 480V | ~80% in 30 minutes |   CCS CHADEMO |
| Tesla | 480V | ~80% in 30 minutes |  |

Benefits of At-home Charging

It's estimated that the average household spends 20% of its total income on transportation expenses.³ Charging your PHEV or BEV at home can reduce or even eliminate ever-fluctuating gasoline costs. At-home charging provides the convenience and flexibility to charge your vehicle based on your schedule and needs.

| Icon | Point #1 | Point #2 |
|---|--|---|
|  | "Refuel" for less than half the cost of a gasoline vehicle. ⁴ | Find out how much you can save using the Ameren Illinois Savings Calculator |
|  | Charge your vehicle while you sleep (just like your cell phone), and in most cases, charging overnight will provide a full charge to start your next day. | At-home charging is available for plug-in hybrids and all-electric vehicles. |
|  | All EV models allow you to schedule charging sessions, giving you complete control of when you charge so you can take advantage of utility rates that may reduce your fueling costs even more. | Track your charging habits and energy use with vehicle or charger apps. |

³ <https://www.aceee.org/blog/2016/07/america-s-transportation-energy>

⁴ <https://www.ameren.com/illinois/residential/electric-vehicles/rate>

At-Home Charging Considerations

The following are a few at-home charging considerations to keep in mind when determining the charger's location, equipment style, and calculating the associated costs.

Location

Whether you are installing a Level 1 or Level 2 charger, there are a few essential considerations to address to ensure convenience and safety:

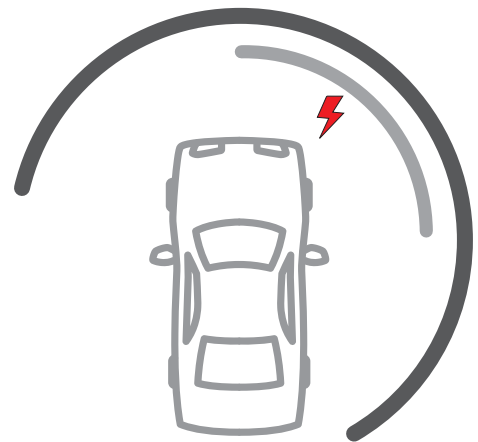
- Dedicated parking space is required for at-home installations.
- Charging equipment must be within sufficient reach of either a dedicated 120-V or 240-V circuit. Charging cord lengths vary from about 15' to 25' depending on the model.
- There should be enough space to connect the charger to the vehicle safely.
- Eliminate location options that require a cord to be wrapped around or draped over the vehicle to reach the charging port.
- Prior to installation, consult with a certified electrician.

Ameren Illinois recommends that you use an Illinois Commerce Commission certified EV charging installer. A list of qualified installers can be found on the [ICC website](#).

Choosing Location

Install Wall Connector in a location that allows the charging cable to reach the vehicle charge port without putting strain on the cable.

- Dark gray: Recommended installation area for Wall Connectors with 18 ft (5.5 m) cable.
- Light gray: Recommended installation area for Wall Connectors with 8.5 ft (2.6 m) cable.



Please note, charge port locations vary by vehicle make and model.



Front Side Port










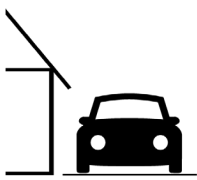




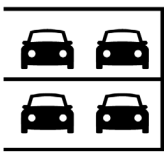








Front Port



Rear Port

Can I Charge Here?

| Location | Can You Charge Here | Level 1 Appropriate | Level 2 Appropriate | Security lock | Tips |
|--|---|--|--|---|---|
| Dedicated Garage  |  |  |  | | A dedicated garage is the most common EV charging installation. Installing a charger here will limit exposure to the elements and often provide direct access to the electrical infrastructure. |
| Carport  |  |  |  |  | Carports must be protected and rated for outdoor use and should have sufficient lighting to avoid tripping hazards. |
| Driveway  |  |  |  |  | Chargers used in driveways must be rated for outdoor use and should have sufficient lighting to avoid tripping hazards. |
| Shared Garage (without dedicated parking space)  |  * |  * |  * |  | * This may require working with your property manager or a 3rd party. Ameren Illinois has resources for residents in these situations. EV drivers without at-home charging access can still charge at public locations around town and, in some cases, at their workplace. |
| On-street Parking  |  ** | N/A | N/A | N/A | ** This would require a dedicated parking space and access to install the necessary 120-V or 240-V circuit and equipment. EV drivers without at-home charging access can still charge at public locations around town and, in some cases, at their workplace. |

Equipment Styles




There are two main mounting styles to choose from when looking at various EVSE brands for residential use. Depending on your EVSE needs and available space, you can use a portable charger or a standard wall mount. For households with multiple EVs, there are Level 2 chargers that offer dual ports.

As mentioned, all EVs come with a standard 120-volt Level 1 portable charger. You can use this charger to plug into a standard outlet, whether it's at your house or another location. Of course, you should always test the outlet first to ensure it can handle the load.

Wall-mounted chargers are available for both Level 1 and Level 2 stations. This version offers a simple design with many conveniences, especially for drivers who choose a Level 2 charger. You can even use this style outdoors with wall mount stations that are rated NEMA 3R or higher as they are rugged enough to handle all weather considerations. Additionally, it is recommended to find a locking unit for outside installation. Wall mounts can be hardwired for permanent installations or plugged into a receptacle for simple removal.

Ameren Illinois recommends cable management for all units. Cables should either be retractable, or a cable organizer can be purchased if not supplied with the EVSE. Cables can create tripping hazards and should never be placed in walkways. A qualified electrician and installer will help you determine if your ideal location is the safest, best option. They will also ensure any electrical work follows all coding requirements.

Visit [AmerenIllinois.com/EV](https://www.amerenillinois.com/EV) for more information and to compare models.

| Type of Charging Mount | Requirements | Perks | Image |
|--|--|---|--|
| Portable Charging Cord (standard w/vehicle) | A 120-V (or 240-V if applicable) outlet that can safely handle the load. | You can take this charger with you wherever you go! |  |
| Wall Mount | Sufficient space for the charging cord to reach the vehicle | Available for Electric vehicle supply equipment Level 1 and Level 2 chargers for both indoor and outdoor use! |   |

Smart or Basic

Another factor to consider is if you would like a smart or basic unit. A smart charger offers additional options through an internet connection. Many offer access to charging data, the ability to schedule charging, connection to your smart home, and much more through apps. Before making a decision, be sure to check the WiFi connection at the location of your installation.

Efficiency

Look for ENERGY STAR certified equipment when comparing available styles. All ENERGY STAR certified EV chargers are verified for safety and can help reduce costs as they are 40% more efficient in standby mode.

Find and compare ENERGY STAR equipment at AmerenIllinois.com/EV.

Warranties

The type of warranty included with the charger varies by manufacturer and can range from fixed-term to renewable. Ameren Illinois encourages you to ask about warranty options while researching the charger that works best for you.

Cost

In addition to available charger locations, cost is often the second most crucial factor used when determining which style to install. Below is a breakdown of potential costs.

Cost considerations for charging at-home include:

- equipment and installation costs;
- cost to charge; and
- cost to maintain.



Equipment Cost

Electric vehicle supply equipment costs range from as low as \$300 to over \$2,000. The two main factors when considering costs are desired features and amperage (or how fast it charges the vehicle). A "smart" Level 2 charger is equipped with special features, including connecting to WiFi to monitor your charging and review statistics from past charging sessions which can increase the cost of the unit. Amperage determines how fast the vehicle battery charges and ranges from 16-80. Please note, it is recommended the electrical circuit be rated for 25% higher amperage than the output of the charger.

Cost to Charge

The electricity cost associated with your charger will depend on two utilization factors - the time of use (if you are on a “time of use” rate) and overall energy use. However, even with longer charge times and more energy use, charging an EV at home will still save you money.

A Consumer Reports study found that a typical EV owner who does most of their charging at home can save an average of \$800 to \$1,300 a year on fueling costs when compared to an equivalent gasoline-powered car.⁵ Calculate your savings based on how far you drive each day, each month, and how many miles you expect to drive in a year using the Ameren Illinois [Savings Calculator](#).

EV Rate Program

Ameren Illinois residential customers who have purchased an EV, and are planning to install an EV charger may qualify for an optional rate program. The EV Rate Program provides rate incentives for electricity use throughout your entire household, including EV charging, when used during the appropriate times for the grid, 11pm - 7am.

Program features include:

- Monthly bill credit of \$4 for the first 12 months.
- PCP (Preferred Charging Period) credit.
- NPCP (Non-Preferred Charging Period) charge.
- Whole home rate.

To qualify for the EV Rate Program be sure to:

- Complete an application through the Ameren Illinois online portal.

Power Smart Pricing

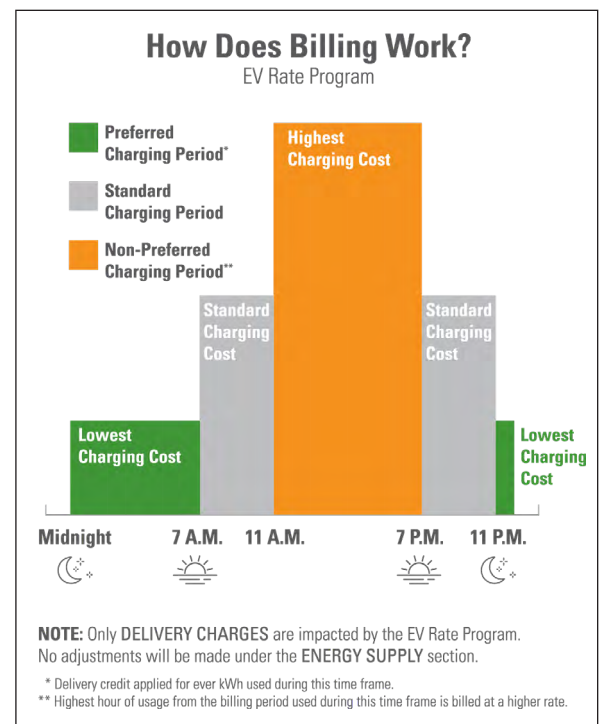
Customers today have more energy supply options than ever — choices that could reduce their energy supply costs.

Options for Ameren Illinois electric customers include:

- a third-party supplier,
- government aggregation, and
- hourly pricing basic generation service (default option).

Ameren Illinois does not recommend one supply option over another, but we do encourage customers to explore all of their options. No matter your choice, you can count on us to deliver the safe, reliable energy you need. As an energy delivery company, Ameren Illinois does not profit from electric or natural gas supply charges. We pass along the price we pay for energy to our customers, dollar for dollar. Look for a supply option that best fits your needs and lifestyle.

[Explore supply options in the Ameren Illinois service territory.](#)



⁵ <https://www.consumerreports.org/hybrids-evs/evs-offer-big-savings-over-traditional-gas-powered-cars/>

Maintenance Cost

Typically, chargers require little to no maintenance.⁶ General maintenance includes properly storing charging cables, checking parts routinely, and keeping the equipment clean. Maintenance requirements can increase as you add more features to a charger, but most use a modular design that allows parts to be easily interchanged.

Cord and plug damage are the most frequently addressed maintenance items. Replacing cords and plugs outside of warranty can cost from \$60 to \$300 depending on the unit. More significant costs can occur when a Level 2 charger is damaged and needs to be replaced or repaired and is no longer under warranty. Some warranties even offer extended options such as on-site maintenance for an additional cost. As with any asset, insurance is always recommended.

Incentives

EV drivers are encouraged to take advantage of incentives for chargers when available. Charger manufacturers offer incentives that can help with installation, maintenance, and repair. You may also qualify for a federal tax credit provided by the Inflation Reduction Act, which allows residents to receive up to \$1,000, or 30% in federal funds, for installing charging at their residence.

For more information about incentives visit [Ameren.com/illinois/residential/electric-vehicles/incentives](https://ameren.com/illinois/residential/electric-vehicles/incentives).

Equipment Installation

Depending on the level of charging you require and the type of equipment you prefer to use, you may need to hire a professional for the install. The following section explores this process, including how to find certified electricians, contractors, and charging equipment

Timeline

The timeline for installation can vary depending on your needs. Though we always recommend consulting a certified electrician, if the parking space already has access to a 120-V or 240-V outlet with a dedicated circuit, installation is as simple as plugging the unit in and securing it safely after verifying the circuit has the capacity to power the charger at its rated amperage. However, in many cases, some electrical work will be required to install the charger and your preferred electrician or installer can assist you in determining how long that will take and provide a cost estimate.

⁶ https://afdc.energy.gov/fuels/electricity_infrastructure_maintenance_and_operation.html

Permits

Though permits are not always required, some municipalities may have permitting requirements for at-home charging. Be sure to speak with your installer to see what permitting (if any) is required.

1. Determine charging needs.
2. Research home charging units at [AmerenIllinois.com/EV](https://www.amerenillinois.com/EV).
Tip: Be sure to compare incentives and warranties.
3. Find a certified electrician. A list of qualified electricians can be found on the [Illinois Commerce Commission website](https://www.illinoiscommerce.com).
4. Schedule a site visit with installer/contractor and obtain a quote.
5. Research permitting requirements (handled by installer).
6. Install charging unit.
7. Sign up for the EV Rate Program to ensure you're receiving the best charging rates available.
8. Tell Ameren Illinois about it.



At-Home Charging Checklist

Ameren Illinois has developed this at-home charger installation checklist to help ensure customers have everything they need to charge their vehicle at home safely.

Determine Needs

Review the differences between Level 1 and Level 2 charging and determine which best suits your unique needs. Answer these questions to help you make your decision:

| | | Level 1 Charging | Level 2 Charging |
|----|---|------------------|------------------|
| 1. | How many miles do you drive per day? | 1 to 50 miles | 51+ miles |
| 2. | Do you require 100-200 miles of a range in a single charge? | No | Yes |
| 3. | Are you able to charge the vehicle for at least 7 hours each evening? | Yes | No |
| 4. | Do you have access to workplace charging? | Yes | No |

Conduct a Power Assessment

Safety always comes first at Ameren Illinois. That's why we recommend having a qualified electrician conduct a power assessment before plugging in your vehicle. Even though Level 1 chargers typically do not require a service upgrade, an electrician can provide you with peace of mind knowing that your outlet can handle the task. They will also help you understand the electrical requirements to install a Level 2 charger. Be sure to discuss:

- any required upgrades;
- the type of charger you want (Level 1 or Level 2);
- the cost of installation; and
- project timeline.

Determine Location

As part of the power assessment, be sure to determine the best location for the unit. As a reminder, be sure to note the charge port location of your specific vehicle. The location should provide hazard-free charging for your vehicle - cords should never be draped over vehicles or placed in walkways. The EV charger must also be guarded against the elements such as rain and snow if it is not outdoor rated.

Research Charging Equipment and Apply for Incentives

Visit the [Ameren Illinois website](#) to compare available charging station models.

Install Equipment

Once you have chosen your charging unit, equipment installer, and location, it is time to install the equipment. Be sure to discuss any possible permitting requirements with your installer. Ameren Illinois recommends that you use an Illinois Commerce Commission certified EV charging installer. A list of certified installers can be found on the [ICC website](#).

Enroll in the EV Rate Program

This is a way to save money while you charge at home during the preferred charging time. [Enrolling](#) is easy.

Plug In and Charge!

Hopefully, this charging guide has helped you learn more about charging an electric vehicle. Plug in whenever you need fuel and enjoy all the benefits of driving electric.

Conclusion

At Ameren Illinois, we understand EV owners may have questions about at-home charging. As the demand for charging continues to increase across the region, Ameren Illinois is here to support our customers in their transition to driving electric.

For more information about electric vehicles, at-home charging, incentives, and additional resources, visit us at AmerenIllinois.com/EV.

Resources

Check out these sources for even more information about electric vehicles and how to charge at home and save:

- [Enroll in the EV Rate Program](#)
- [Electric Supply Choice](#)
- [Potential Savings Calculator](#)
- [Compare Level 2 Chargers](#)

Interested in Workplace Charging?

Workplace charging may already be available where you work. Reach out to your facilities or human resource departments to see if EV chargers are available. If not, be sure to tell them about the [charging incentive](#) available as well as the [EV Rate Program](#) to help reduce costs.

Interested in Charging at Apartments?

Ameren Illinois is working with business customers to install EV charging equipment throughout its service territory, including apartment buildings. Speaking to your property manager is an excellent place to start when determining if at-home charging will work for you. Need tips and [information](#) to share before you reach out?

