What you need to know about Electric Vehicle Charging

UUANI

UNITARIAN UNIVERSALIST
ADVOCACY NETWORK
OF ILLINOIS

Electric Car Home Chargers

Charging an electric vehicle (EV) or plug-in hybrid is mainly done at home. .Home charging accounts for 80% of all charging done by EV drivers. This is why it's important to understand the options available, along with the pros/cons of each.

There are two types of home charging: **level 1** and **level 2**.
Level 1 charging happens when you charge an electric vehicle using the charger included with the car. These chargers can be plugged in with one end into any standard 120V outlet, with the other end being plugged directly into the car. Level 1 charging is slow, usually in the range of 4 to 6 miles per hour of charge.
Level 2 charge connectors are sold separately from the car, although they're often purchased at the same time. Level 2 charging requires a slightly more complicated setup, as they are plugged into a 240V outlet (the type of outlet used with washers, dryers and electric stoves) which allows charging 3 to 7 times faster, depending on the electric car. The SAE J1772 connector is used by all EVs, other than Teslas, for Level 2 charging, and Tesla provides an adapter, so Teslas can use the SAE J1772 when getting a Level 2 charge at a non-Tesla charge point. Home owners may have to have a new 240V circuit installed to facilitate Level 2 charging. With Level 2 it takes around four hours to fully charge a 30-kWh car battery (standard battery for an electric car), which allows you to make the most out of driving your EV.

In addition to convenience, another advantage of home charging is the low cost of residential electricity compared to the cost of public charging stations. The level of savings depends on the price of electricity and gas at a particular point in time.

Electric Car Public Charging Stations

Public charging allows EV drivers to charge their electric cars on the road when they need to travel longer distances than allowed by their EV's charge at home. These public chargers are often located near restaurants, shopping centers, parking garages and lots, and other public spaces.
To locate them easily, you may use ChargeHub's charging stations map that is available on iOS, Android, and web browsers. The map lets you easily find every public charger in North America. You can also see most chargers' status in real time.

There are three main things to know about public charging: the different levels of charging, the difference between connectors and the charging networks.

Most public charging stations use either Level 2 or Level 3 chargers. Level 2 charges use the same 240V AC (Alternate Current) that one might have at home. Level 3 chargers - also called DCFC (Direct Current fast chargers) or fast charging stations – use 480V DC. A few electric vehicles cannot charge at Level 3 chargers, so knowing your vehicle's capabilities is very important. A Level 3 charger can charge up 80% of a 124 mile range in 30 minutes, or 80% of a 249 mile range in an hour.

Charging at a DCFC station is only effective if your battery's state-of-charge (SOC) is below 80%. After that point, charging will slow down significantly. Therefore, once you reach 80% of charging, you should plug your car into a level 2 charger, since the last 20% of charging is as fast with a Level 2 charger as with a Level 3, but it is way cheaper. You can also continue your journey and charge your EV back to 80% at the next level 3 charger you meet on the road. If time is not a constraint and you're planning to stop several hours at a charger, you should opt for a Level 2 which is slower but less expensive. Also, it is recommended that one not use DC fast charging when not necessary, because the fast rate of recharging can adversely affect the lifespan of an electric car's battery, if done too often. Which Connectors Are Available for Public Charging?

Level 1 and 2 Connectors: The most common connector is the SAE J1772 EV plug. All electric cars in the US and Canada can charge using this plug, even Tesla cars as they come with an adapter. The J1772 connector is only available for level 1 and 2 charging. Level 3 Connectors: For fast charging, the SAE Combo (also called CCS for "Combo Charging System") is the most used connector by North American electric cars manufacturers. It is used by all EV manufacturers except Tesla, Nissan and Mitsubishi. Nissan and Mitsubishi use the CHAdeMO connector. These two connectors are not interchangeable. The third important connector is the one used by Tesla. That connector is used on Level 2 and Level 3 Tesla charging stations and are only compatible with Tesla cars.

Electric Car Charging Station Network Operators

To be able to properly use public chargers, you'll have to learn which charging networks are available in your area. There are many different public charger operators across the United States. Most of them are specific to certain areas, but there can be several of them in the same area.

To use a networked charger, also known as smart public charging stations or connected stations, you must subscribe to the network. In most cases, registration is free and fees only apply when you use their chargers. You'll need a RFID card (one that reads payment details with a tap) or the mobile app of the network to activate and use the charger.

Independent Public Charging Stations

Independent public chargers are installed by local businesses or by public entities who want to make charging available on their property. It's not necessary to be a member of a network to use those chargers. Some conditions may apply to some of them.

Charging an Electric Car at Work

Workplace charging works very similarly to home charging. It is offered by an employer to their employees. The employees therefore have access to parking spaces with Level 2 (or Level 1) charging stations during the day. Depending on your habits, charging at work could provide enough power for most of your travels.

When combined with home charging, workplace charging can double your daily electric range. This is particularly interesting for plug-in hybrids, as you can use the electric motor for longer distances and therefore save money on fuel.

The electricity costs of workplace charging are often taken on by the employer, which means employees can charge at work for free. In other cases, the employer charges fees to use the charger, but the cost is usually lower than charging at a public charger.

Government Incentives for Workplace Chargers

In order to encourage employers to install charging stations for their employees, many governments have put in place programs that reduce

purchasing and installation costs, as well as different advantages for the employer. However, many employers are unaware of the existence of these programs, and it falls on the shoulders of interested employees to talk to them about it. **Installing EV Charging Stations at Multi-Unit Dwellings**

Level 2 charging stations can currently be bought for about $700. Chicago's Drive Electric program, which published a brochure on how to install EV charging stations at multi-dwelling buildings, reports that installation costs for a Level 2 charger range between $2,000 and $10,000, depending on conditions. So securing multiple bids would be wise. In Illinois, under the recently passed Clean Energy Jobs Act, the Illinois EPA is to create a program that will cover up to 80% of installation costs for EV chargers, starting July 1, 2022, as long as the prevailing wage is paid for the installation.

The brochure referred to in the last paragraph lists the following steps for a multi- dwelling unit building owner or manager: 1) Hire an electrical contractor or public charging station manager. 2) Consult with state and local law for available rebate programs and their conditions. 3) Notify the local electric utility of your intent. 4) Finalize the charging station location. 5) Obtain permit. 6) Install the charging station.

The building owner or manager may choose to charge each plug-in EV (PEV) owner residing in the building a fixed monthly fee for the use of the equipment and electricity used. Alternately, a sub-meter for the charging station could be installed to charge each PEV owner based on readings from the submeter.

Sources

2020 Guide On How To Charge Your Electric Car With Charging Stations – chargehub.com

North American EV Plug Standards – evcharging.enelx.com

How does RFID work? – Seattle Times

How To Install Electric Vehicle Charging Stations At Multi-Unit Dwellings – Drive Electric Chicago

Illinois to Rebate 80% of Electric Vehicle Charger Install Costs – kapitalelectric.com