Home EV Charging: Do You Need A Level 2 Charge Unit?

BY FRANK SCOTTI | SEPTEMBER 02, 2021

As of 2020, nearly 1.8 million EV's were registered in the U.S., more than three times as many as in 2016, according to the International Energy Agency (IEA).

California has by far the highest share of EV's of any U.S. state – which is to be expected, given that for decades the state has required carmakers to build EV's and has used an array of rebates and other incentives to encourage Californians to by them.

Considering the continuing effort to transition to all electric vehicles in California, we predict EV sales will triple in 2022.

The top issue facing EV sales and adoption is range of charge and speed of charge.
Range per charge is in the hands of manufacturers, and is nearly equal now to a tank of gas, and in some cases, exceeds traditional gas engine range.

The second concern, speed of charge, has improved greatly in recent years both for public charging and home charging. Most EV owners plug in their vehicle when they get home, charging overnight.

If you are one of the 5 million EV buyers in 2022, you're going to need to charge your vehicle daily.
So, you're probably curious about a home EV charger. If not, you should be.

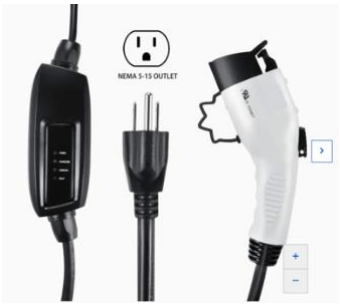
You may or may not already know that there are three primary levels of EV chargers: Level 1 basic home chargers; Level 2 higher speed home charger; and the Level 3 high-capacity commercial chargers. We're going to take a look at Level 1 and Level 2 charging units.

Level 1 Charging

The typical EV owner charges their vehicle by plugging into a 120V, 15-amp outlet at home. This is referred to as Level 1 charging. Most all EV's sold today have on-board charge controllers that recognize the capacity of the source, and charge at a set, safe speed when simply plugged in to a 120V outlet in the garage. The vehicle is capable of charging faster, but is limited to the capacity and rating of the outlet.
To be clear, all EV's come with an adaptor for Level 1 charging from a standard wall outlet at home.
There should be no need to have to purchase a Level 1 cordset.

The Pros of Level 1 Charging: It is plug and drive. Simple. Easy. Affordable. No additional cost or electrical modifications. No other equipment or adaptors needed.

The Cons of Level 1 Charging: painfully slow charging. A Level 1 charger and delivers on average about 2-3 miles of range per hour of charge. So, an overnight 10hr charge (8PM to 6AM) on a Level 1 charger delivers about 20-30 miles of charge. If you are trying to charge only at limited EV charge rate hours as set by your utility provider (typically 12AM to 3PM), then your charge range will be a six-hour window, and only deliver 12-18 miles of charge.



Typical Level 1
Plugin Charge Cordset

Level 2 Charging

Level 2 charger is becoming the standard for home EV charging, but it requires some electrical upgrades that are not typically existing on a home.

A Level 2 charger will require a dedicated outlet that has the proper volt and amp rating. This type of addition requires a licensed electrician and some hardware.

A basic Level 2 charger is U.S. spec 240v/ 60 hz, 40 amps. Of course, there are multiple Level 2 configurations available to accommodate charge needs of any EV, as well as being compatible with a home's electrical system already in place.

The Pros of Level 2 Charging: Add greater range of charge per hour. A level 2 charger typically charges about 7X faster, delivering 200+ miles per 10-hr charge. The charger can be placed at a convenient location. 25' charge cable. Indoor/outdoor rated. Wall mount and cable cradle.

You'll also be able to save money on your electrical consumption by charging your vehicle at strategic times when electrical demand is lower. Since you can charge faster, you can take advantage of lower electrical rates during the night, which helps to maximizing savings on an already energy efficient vehicle. As in the example above, charging during EV rate hours of 12AM to 6AM will deliver a 90 to 180 mile charge.

The Cons of Level 2 Charging: Expense. A Level 2 charger requires a licensed electrician to install. In most cases, proper sized wiring must be run to the preferred charger location, as well as modifications to the main service panel. A typical hardwired installation costs about $1,400 in California for unit plus install, complete. There are plugin Level 2 units that do not need to be hardwired. But they will still require a licensed electrician to install the proper amp outlet. You're still looking at about $1,400 for unit plus install.

A Level 2 charge unit that charges 7X faster or more is a no brainer even if you think you only drive 10 miles per day or less.

Hardwired Level 2 EV Charge Unit w/ 25 ft. charge cable

Types and Models of Level 2 Chargers

Not all level 2 EV chargers are the same. Level 2 chargers vary widely in power rating and charge speed. The lower end Level 2 units charge up to 15 miles/hr. and require a lower volt/amp rated outlet. The higher end Level 2 units charge up to 30 miles/hr. or greater and require a higher volt/amp rated outlet.

A Level 2 charger unit is usually chosen to be sized to the desired charge speed as well as the capacity of the main service panel.

Now that you understand the basics of EV Chargers, here are a few considerations to help you choose the right EV Charging system for your needs.

First, decide on whether you need a Level 2 charge unit. Select a unit based on how many miles you drive each day, and how fast will you need your EV charged. If you drive less than 10 miles each way to work, a Level 1 charge unit should suffice. If you drive more than 10 miles each way to work, definitely go with a Level 2 charge unit. If you will have more than one EV, you can use two Level 1 charge units, or go with a Level 2 unit and split the charge time (the latter option not being as convenient).

Next, decide where you will want to place the unit for the most convenient access. Consider the distance to the main service panel, as cost will increase for every foot of electrical run. Will you need a long charge cable? Level 1 and Level 2 charge units can be placed almost anywhere, inside or out.

If the charge unit is located outdoors, will you need a locking device for security?

Smart or dumb unit? A “smart” unit typically inly means you can monitor the unit via Wi-Fi or PLC and allows you to monitor the charging. Having a smart unit will add features, but also comes with more potential problems. Most Level 1 charge units will not have Wi-Fi, simply to keep the cost down.

Most all Level 2 charge units are NEMA rated for indoor/outdoor use. Most all come with a J1172 connector, which is the common EV port. Tesla typically provides a charge adaptor that allows their vehicles to use J1772 charge units.

Here are a few brands that we are familiar with:

Charge Point Home: Up to 50-amps of power. WiFi enabled.
Grizzle-E: Up to 40-amps of power. Most affordable.
Clipper Creek: Up to 64-amps of power. Most stylish. Most versatile.
SolarEdge HD Wave: An integrated solar PV inverter with EV charger. Charge directly from your solar panel output. Eliminates the need for an additional, separate EV charge unit.

Don’t stress over your decision too much. More than likely you will own your EV for less than 5 years before upgrading. More than likely you will also be upgrading your EV charge unit in five years.

Looking for a quote on an EV charger? Solarponics designs and installs solar PV, EV chargers, Battery Backup and Storage for residential and commercial projects on the central coast of California. Visit www.solarponics.com for more information.