Plug-In Vehicles

Types

BEV: **B**attery **E**lectric **V**ehicle

Operation is entirely electric. There is no gas engine. Propulsion and cabin warming & cooling are provided only by a very large battery.

PHEV: **P**lug-in **H**ybrid **E**lectric **V**ehicle

Designed to operate like a BEV, initial driving will only use electricity. Having a much smaller battery, a gas engine will provide power when plug-supplied electricity is used up.

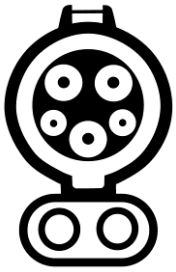
Charging

Level 1: 120-volt AC

Basic home charging, enough overnight to cover most daily driving. You will get about 40 miles in 8 hours.

Level 2: 240-volt AC

Fast home charging, enough overnight to replenish full BEV capacity. Expect from 200 to 300 miles in 8 hours.



DCFC: Direct Current Fast Charge

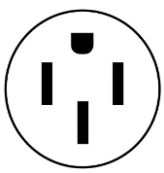
Fastest option for BEV. Typically not available for PHEV. Time for charging from 20% to 80% is roughly 30 minutes, though that will vary based on vehicle, charge-level, station and temperature.

Pictured (left) is the **CCS** plug. A new standard (right) known as **NACS** will replace it. Adapters are expected from automakers.

Connections

Standard Power

This common household outlet provides 120-volt service for level-1 charging.



High Power

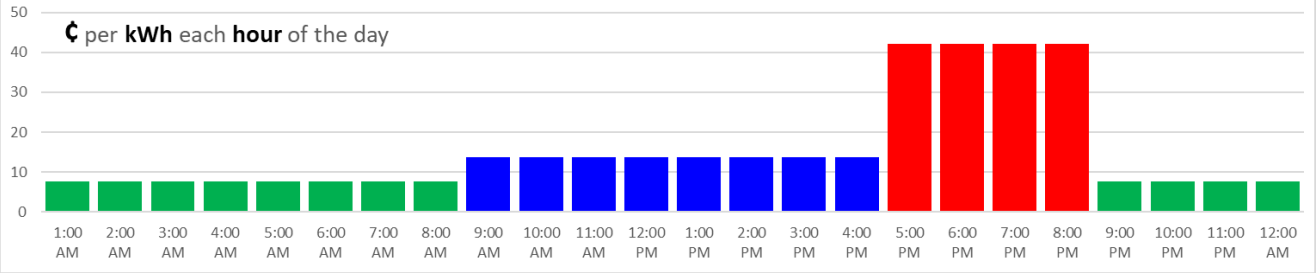
This outlet type (NEMA 14-50 pictured) provides 240-volt service for level-2 charging. It is an example of what plug-in vehicle owners add to their home for faster charging and electricity cost discounts.

Cost

The most common question asked is: "*How much will my electric bill go up?*"

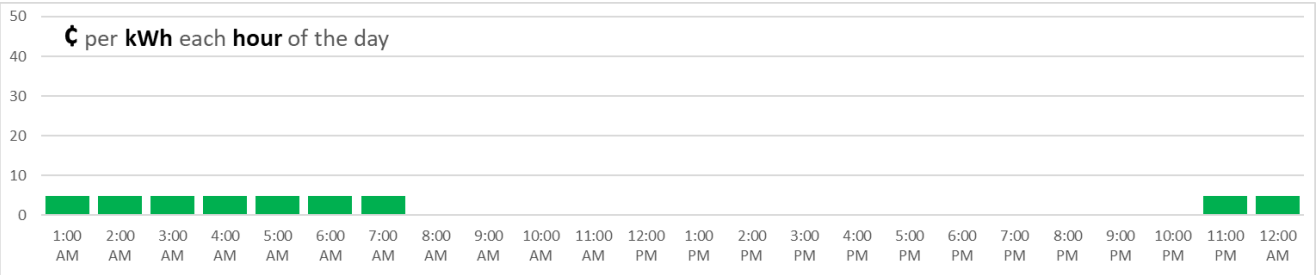
Here are some basic numbers to consider, using 3.5 miles/kWh as typical electric efficiency:

- **$0.20/kWh** (regular price) driving **1000 miles** calculates to **$57.14**



Time-Of-Use pricing from your electricity provider, like the example above, can reduce cost:

- **$0.1377/kWh** (morning discount) driving **1000 miles** calculates to **$39.34**
- **$0.0755/kWh** (overnight discount) driving **1000 miles** calculates to **$21.57**



Off-Peak pricing, which restricts charging to low-demand times, can reduce cost even more:

- **$0.0487/kWh** (off-peak discount) driving **1000 miles** calculates to **$13.91**

For perspective, driving 1000 miles with a 35 MPG gas vehicle at $3.35/gal would cost **$95.71**

Timing

For charge results (based on 3.5 miles/kWh) related to timing, here are some basics for **30 Minutes**:

Type	**kW** (speed)	**kWh** (quantity)	**Miles** (distance)
Level-1 (12 amps @ 120 v)	1.44	0.72	2.5
Level-2 (16 amps @ 240 v)	3.8	1.9	6.7
Level-2 (32 amps @ 240 v)	7.7	3.8	13.3
Level-2 (40 amps @ 240 v)	9.6	4.8	16.8
DCFC (50 kW)	50	25	87.5
DCFC (150 kW)	150	75	+200