

CHOOSING A HOME EV CHARGER

Barb and Greg Whitchurch

There are more than 16 million electric vehicles (EVs) on the roads now. Many of us have been driving them for several years, and we live everywhere, from the equator to the Arctic Circle.

Let's quickly get past some disinformation FUD (fear, uncertainty and doubt). The batteries last far longer than most ICE (internal combustion engine) cars last: www.bit.ly/old-batts. Battery fires are far less likely than ICE and hybrid fires: www.bit.ly/veda-car-fires. There, done!

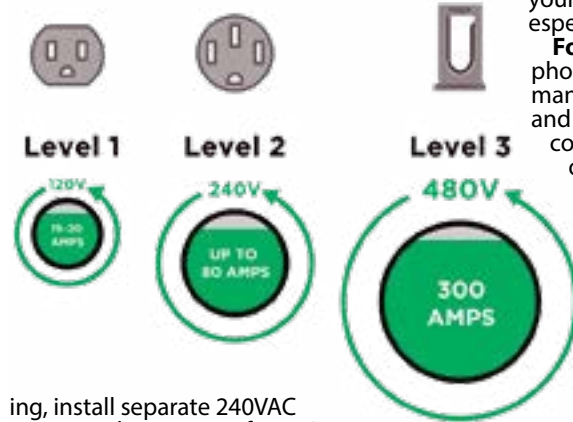
Many who live in condos and apartment buildings charge at work, where they shop, at charging stations, in parking garages, or along streets with combination parking meters and chargers. Since electricity and batteries are so much safer than gasoline, the possibilities seem almost endless.

At home we ourselves just plug the Level 1 (L1) chargers that came with our cars (new ones cost about \$200 and are level one and level two combined!) into a regular wall socket in our garage. Some folks run a heavy-duty extension cable (10- or 12-gauge, not more than 25 feet) out a window or door to the charger that came with the car. The charging ports and plugs are designed for exposure to bad weather.

The authors have been driving EVs for seven years and only EVs for five years, and charging is accomplished at home with L1 "trickle" chargers. This method supplies about four miles of range every hour, which easily covers 95% of their driving needs. They charge "away" when traveling more than 200 miles. For instance, they regularly drive 1100 miles round-trip to see grandkids in Canada (where there are still many more chargers than here in New England).

Think this through a bit. How many miles do you drive per day? Per week? You didn't fill up your ICE car every day; you don't need to do so for your EV either. Some owners only fully charge while shopping on the weekend: www.bit.ly/get-ev-110. The authors charge their EVs to 70% at home unless they're going on a trip.

Level 2 (L2): While L1 chargers draw less power than a hair dryer or toaster, a L2 might be the biggest load at your house. Some folks who drive 150 miles every business day (and don't yet have charging available at work) and want faster charging,



ing, install separate 240VAC wiring to their carport for an L2 installation.

L2 chargers often come with the car as well; some dealers and car manufacturers will pay for their installation, too. The authors' Bolt EUV came with L1 and L2 and free installation. These deals vary, so check ahead. And don't forget to look into the federal, state and local utility incentives. (Pages 16-17 of any G.E.T. issue can help.)

Possible Deal Breakers: (1) If your utility transformer - the big "can" out on the pole, which you might share with another house or two -- can't handle the L2 load you're planning, you'll have to wait and pay for an upgrade from your utility first! (2) Your home's entrance panel might not be fit for the new load --- a very expensive replacement or upgrade, but probably a good thing to do for older homes anyway. (3) Finally, the car determines the maximum L2 power it'll accept; if you provide more, it'll just not be used. But you could split the power to two vehicles from one two-car L2 charger.

Caution: As with other home wiring projects, safe installation is important. Long-duration heavy loads are often not anticipated in standard home wiring specifications; see www.bit.ly/charger-warning. An experienced and well-informed electrician is important. An electrician familiar with solar and backup battery installations might be a good choice. Do not overlook the normal criteria of whether they are licensed and insured.

A 30-amp L2 can give you 300 miles in 12 hours overnight. But some L2s can draw 80 amps! This would be a HUGE draw on your service panel, main breaker and pole transformer. If you turned on

every electrical appliance in your house, a high-powered L2 charger could double your draw. Be careful what you wish for, especially if you don't really need it.

Focus on the future. Our cell phones, computers and TVs (and for many, our doorbells, water heaters and security cameras) are all being connected through the IoT (internet of things). Soon enough our car batteries, home solar PV panels, backup batteries and water heaters, as well as the grid, will communicate with one another in order to keep our bills lower and the grid stable: www.bit.ly/get-geb.

Homeowners will sell grid stabilization service (e.g., peak shaving) and their excess energy storage and solar PV production back to their utility providers. Our cars, backup batteries and solar panels will back up our homes when the grid does fail. More and more EVs are coming with vehicle-to-load (V2L: sockets for 120VAC and 240VAC) capability built in so that they can serve as mobile power sources!

Search: Newer chargers are offering more and more options -- although less so in the U.S., where we are way behind in EV adoption. But things are changing fast. Look for something that offers vehicle-to-home (V2H, bi-directional) backup. Some will charge two cars at once. Look for something that works with the solar PV you might have soon, and which works cooperatively with any home backup battery system you might get www.bit.ly/ct-why-vpp.

Some specifics: L2 chargers are evolving quickly, and satisfaction is pretty dependent upon installation and use. A colleague swears by her portable Grizzle-E charger which she uses at home and when she visits her dad. Start looking here: www.bit.ly/mt-l2, www.bit.ly/cd-l2, www.bit.ly/forbes-l2, www.bit.ly/cnet-l2, www.bit.ly/pm-l2, and www.bit.ly/nyt-l2.

Some will install right at your meter on the power pole or your outside wall: www.bit.ly/mtr-charger! Others will share the clothes dryer 220 amp socket or wiring, selecting between the two automatically: www.bit.ly/dryer-charger. Others can integrate directly with your solar PV array: www.bit.ly/mtr-charger. They can be installed on the incoming power lines before they enter your panel. If you live where re-wiring possibilities are very limited, refer to www.DCCElectric.com/.

See the V2G article in this issue for much more on what to look for in L2 chargers. There are so many options. But consider depending on your L1 just to start --- you might be very pleasantly surprised.

The Whitchurches live cheaply and securely with their EVs at their solar-powered Net Zero+ Passive House. For related articles: www.bit.ly/get-w-ev.

Note: links are clickable in the online edition of this article at www.greenenergy-times.org.



EV charging at your home is convenient. (AdobeStock/485082167)



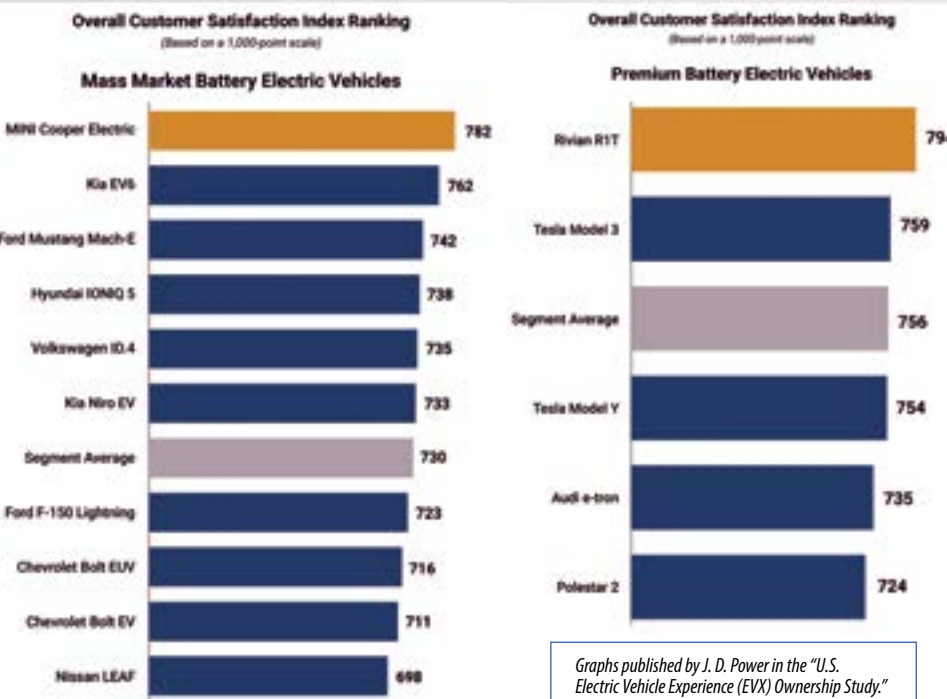
J.D. POWER'S EV SATISFACTION

Cont'd from p.4

satisfaction with accuracy of stated range also is higher (707 vs. 680, respectively). Truck manufacturers that communicate the effect that towing has on range—like they do with gas mileage—seem to help set owner expectations.

• Changing landscape of first-time BEV owners: The study shows an increase of 11 percentage points from 2022 in the rate of first-time BEV ownership, rising to 85% from 74%. However, with a host of new product offerings, the mass market BEV segment is attracting new owners at a more rapid rate, as the percentage of first-time BEV owners in the segment jumped to 89% from 67% in 2022. While more vehicle shoppers are being drawn to EV ownership, satisfaction among first-time BEV owners is higher than among veteran BEV owners in only one category: vehicle quality and reliability (756 vs. 749, respectively). In the mass market segment, 68% of first-time BEV owners say that expected lower running costs and tax credits/incentives were the primary reasons for purchase, while driving performance is the most

J.D. Power 2023 U.S. Electric Vehicle Experience (EVX) Ownership Study™



Graphs published by J. D. Power in the "U.S. Electric Vehicle Experience (EVX) Ownership Study." Rankings are based on numerical scores, and not necessarily on statistical significance.

frequently cited purchase reason (75%) among first-time premium BEV owners.

Study Rankings

Rivian R1T ranks highest overall and highest in the premium BEV segment with a score of 794. Tesla Model 3 (759) ranks second.

MINI Cooper Electric ranks highest in the mass market BEV segment with a score of 782. Kia EV6 (762) ranks second and Ford Mustang Mach-E (742) ranks third.

The number of award-eligible models in the premium segment has grown from four to five year over year, while award-eligible mass market models have nearly doubled (from six to 10). Satisfaction among owners of premium EVs averages 756, while satisfaction among mass market EV owners averages 730.

The U.S. Electric Vehicle Experience (EVX) Ownership Study, now in its third year, implements a methodology change for 2023 by narrowing the satisfaction index to focus on the first year of ownership. The overall EVX ownership index score measures electric vehicle owner satisfaction in both premium and mass market segments. The 2023 study includes 10 factors (in *Cont'd on p.7*