This piece emphasizes that most if not all of a plug-in vehicle's charging needs can be met with a humble 110V outlet at modest cost and no great infrastructure upgrades.

Why the focus on Fast Chargers?

There seems to be a lot of focus on installing fast chargers for electric vehicles right now. While I welcome these units, I want to stress the importance of humble "110" outlets – so called level 1 charging.

Given the price of just the DC fast charger units themselves (a recent Nissan advertisement in Charged magazine quotes $15,500 each) that equates to an awful lot of 110V receptacles. I would suspect that entire parking lots that will play host to a DC fast charger could be outfit with 110V outlets at each space for the same or less cost. Also the power requirements for fast chargers are substantial, perhaps equivalent to 20 to 30 110V outlets, and may potentially contribute to peak demand charges.

I wonder how much of this focus is derived from the gas pump mentality of pumping into the vehicle a huge amount of energy as quickly as possible? In contrast the EV owner will typically charge overnight and depart in the morning with a full vehicle every day. As I sometimes say to answer the common question "How long does it take the charge?", I don't really care, as long as it's less than the 8 hours that you sleep! It could take 5 minutes or 5 hours, it doesn't matter.

Now let's say that the charging is done at 110V. Given that this usually implies a rate of at most 1,500W, that provides about 5 miles per hour into a typical plug-in vehicle. Assuming the 8 hours mentioned above gives about 40 miles restored to a plug-in vehicle, at minimum, overnight. That would seem to satisfy the majority of commuters in the U.S., as the average daily miles driven per driver, according to the 2009 National Household Travel Survey was 29 miles (see nhts.ornl.gov - interestingly the total vehicle miles have fallen since 2008, according to the Federal Highway Administration). Of course if you need more miles, you can initiate the charge earlier in the evening.

The second most common location for charging is at work. Here again, the vehicle typically sits for 8 or more hours and another 40 miles worth of charging could be available for the minimal cost of installing a 110V outlet at each parking space.

So, given that widespread availability of 110V outlets at workplace and public parking facilities could provide a total of 80 miles or more per day (including 40 from charging on 110V at home), and therefore a total of 29,200 miles of driving per year, without any change to current habits, it seems strange to focus on adding a few fast chargers that will only be used outside that scope. I'm reminded of the TEPCO study that showed that the installation of numerous fast chargers in Tokyo led to deeper discharge of EV batteries and hence more miles driven without a corresponding increase in use of the

fast chargers. Simply knowing that the facility was there gave drivers the confidence to go farther afield or use more of the capacity of their vehicles. So, yes, fast chargers have their role but making 29,000 miles of driving available to a greater number of drivers by proliferating 110V workplace charging might seem worthy of higher priority.

In supporting evidence, I would state that we've successfully run not just one but 2 plug-in vehicles off 110V (our Nissan LEAF and Prius PHEV) for many months and many thousands of miles until recently when our higher power Blink EVSE was installed. Now we charge one vehicle using the Blink unit and the other still at 110V.

Perhaps the thinking behind this fast charger focus is also illustrated by the people who suggest putting them at gas stations. No, I don't want to hang out at a gas station, thank you – do you? A coffee shop or bookstore yes, maybe, or a location where I know I have to spend time, like a grocery store. One of the big advantages of EVs is not having to visit gas stations!

Of course installing more fast chargers is great and I don't want to denigrate the process, I just want to show how much utility can be provided, typically for lower cost, by the lowly 110V outlet.

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