

## **The Recharging Conundrum**

In the previous article in this series, we started to address the question: does charging an EV take “too long”? We found that, for typical local use, charging time may not be an issue at all.

In this article, we turn to charging on longer trips.

### **On the Road Again**

You’ve been driving along for 150 or 200 or 250 miles and the battery is getting low. Time to stop and charge up – but will it take forever? Let’s take a closer look.

To start with, it’s just a fact that it takes longer to recharge an EV than it does to add gas for a similar amount of range. Figuring out exactly how the times compare is tricky, though, for several reasons:

- The amount of time needed for a recharge varies depending on the state of the battery: an almost completely discharged battery charges more quickly than one that’s nearly full.
- Temperature plays a role, as very cold or very hot temperatures slow down charging.
- You don’t always need to “fill” the battery: often the goal is just to give you enough charge to get where you’re going, either to the next charger or to your destination where the battery can charge for a long time.
- Most importantly, there’s the capacity of the charger to deliver and the capacity of the battery to accept “fast charging”.

What is fast charging? It’s simply charging to add serious miles in minutes rather than hours. If the battery in your EV accepts only “standard” charging, such as what you might get from a charger at home or in a parking lot, a charge to take you 150 miles might take several hours. Not good! But fast charging can reduce that time to as little as 20 to 30 minutes. (Fast charging speeds continue to increase, so those times will shrink in the future.)

A word of caution: not all models of all EVs can use fast charging. On some, fast charging is standard (for instance, all Teslas), while with others fast charging capability is optional (for instance, Nissan Leaf and Chevy Bolt). If you are buying an EV, be sure to check.

Until recently, Tesla had the only serious network of fast chargers: their Supercharger network now covers most interstates and major highways and can easily take you from coast to coast. (Full disclosure: I’m writing from the perspective of a Tesla owner who can and does take advantage of that Supercharger network.) Buildout of non-Tesla fast charging networks is underway, so owners of other vehicles have more and more options of their own.

### **Time After Time**

Now 20 - 30 minutes may sound like a long time compared to the time that it takes to fill even a hefty gas tank – and it is. But here again we need to ask the right question: how long do *you* need to spend waiting? Remember, with an EV you can leave the vehicle to do your own “recharging” while the car does its version.

Consider a gas stop on a long trip: you drive into the station, pull up to the pump, and gas up the car. But you're not done yet! You may need to take care of yourself: move the car to a parking space (you surely would not be so discourteous as to leave it sitting at the pump), go inside to use the restroom, maybe buy a cup of coffee and a snack, even walk a bit to stretch your legs after all that driving, and finally get yourself and any purchases into the car and take off. Or maybe it's time for lunch or dinner, so you pull into the restaurant parking lot and stay for a meal.

With an EV, you pull into the charging station, plug in, and immediately head for the restroom or the coffee shop or the restaurant. (It's not a coincidence that many fast charging stations are built next to stores and restaurants.) By the time you are done taking care of yourself, the car has taken care of itself, so away you go.

That's the optimistic scenario, and obviously it doesn't always work that way. Sometimes you need a lot of charge, which will take a while, and you've already eaten lunch. Yeah, you can grab a book or your laptop or your phone and kill some time in the coffee shop. But if you would rather be on your way as quickly as possible, then yes, a gas-powered car would get you back on the road faster.

But keep this in perspective: if you are using a fast charger, we're talking about extra minutes, not "hours". (And don't forget all that time you've saved every month by charging overnight at home: on balance you still may come out ahead.) With some planning, you can minimize these kinds of stops.

### ***One Way Only***

There's another twist here: if you are on a multi-day journey, consider that motels (and campgrounds if you are tenting) offer guests free or low cost EV charging – and again, charging overnight doesn't take any of your time. In other words, if one of your charging stops is an overnighter, the car charges while you sleep. (This also can work if you are staying with friends who have a 240V outlet. Dryer plugs, anyone?) If your "long" trip is not real long, say to Lake Erie for some fishing, overnight will be your *only* charging.

### ***In the End***

We're back where we started: whether EV charging is "too slow" depends on your own situation. If you mostly drive in Columbus with, say, one or two trips a year to visit family living within a few hundred miles, one or two charging stops on those long trips may not be a big deal at all – and then you can take advantage of that painless daily (overnight) charging most of the time. On the other hand, if you make lengthy trips every few weeks, driving hundreds of miles each time, recharging may be just too big a hurdle.

### ***The Future***

As I write this, Tesla has just announced an enhancement to existing Superchargers to be implemented in the next few weeks; this software upgrade should reduce recharging times by perhaps 20%. Tesla also announced a new generation of Superchargers that should reduce typical charge times to about 15 minutes. In the non-Tesla world, chargers being built across the country could be as fast as Superchargers or even faster. Of course, those super-fast

chargers are only now being rolled out, a process that will be ongoing for several years. But clearly recharging EVs is getting faster all the time.

### ***To Be Continued***

In this article, part 2 of our series on EV charging times, we looked at charging on longer trips. But our discussion was kind of theoretical. How does all this, including “fast charging,” play out in the real world? In the third and final article in this series, I’ll share some real-world experiences with long trips in an EV.