Thoughts on Destination Charging

Ian Russell

As an Electric Vehicle driver I want to be able to charge my car when I'm not using it so that it's ready for use at all times and I don't have to worry about charging. The mind shift required for EV charging thinking is similar to the change when we all started to use smart phones. Many initially baulked at the need to charge everyday but now it is second nature to most people to plug them in every night. When I am at home charging my car is cheap and easy. I just plug into my home charger and let the magic that is Intelligent Octopus figure out when to charge in order to minimise the costs. When I'm away from home charging requires a little more advanced planning. On a long journey RAPID charging is a requirement, where as much DC power as the car can accept is happily consumed (>50KW). This necessitates using relatively expensive chargers at service stations and having a backup plan in case there is a queue (although in my experience this is less of a problem if you plan to use the increasing number of services with lots of chargers and/or travel outside the busy periods). But overnighting, parked up away from home is more hit and miss. This is often when I want to be charging, as indeed does the grid want us to be charging using their surplus power. But utilising a high speed Rapid Charger is an unnecessary and expensive response to this need. This need is generically called *destination charging*, but is a term I find a bit of a misnomer.

There are 3 basic *classes* of destination chargers:

1. Chargers where you plan to spend a few hours, for example in a town car park, shopping centre, entertainment centre, workplace, visitor attraction.
2. Chargers where you spend more time, typically overnight, for example at a travel hotel, B&B.
3. Chargers where you can park up for longer, for example at a holiday hotel, AirBnB, holiday let.

The basic requirements of chargers are different in their electrical power deliver and charging regime. Specifically for the power delivery there has to be a meaningful amount of energy that can be transferred to the EV during the plugged in time, and this means that the *classes* of destination chargers need to be served by the different *charger types*. These are:

1. FAST chargers: AC charging up to 22KW (typically fed from a 3-phase electrical supply). These can add ~60miles/hour(1).
2. SLOW chargers: AC charging up to 6KW (typically fed from a single phase of the electrical supply). These can add ~18miles/hour(1).
3. EVSE chargers: AC chargers up to 3KW (fed from a 13A socket using so-called "Electrical Vehicle Supply Equipment"). These can add ~9miles/hour(1).

Some outlets are installing RAPID or ULTRA RAPID chargers (>50KW) as destination chargers. I think these are inappropriate for *destination* charging. A greater number of FAST chargers are preferable to a smaller number of RAPID chargers so more people can charge (and the multiplicity can help when chargers fail).

(1) These figures are very rough and depend on many factors, including the cars efficiency, the battery state of charge, and the ability of the supply to deliver the power.

There's a good match here between the classes of destination chargers and the types of chargers.

In the early days many of the class 1 locations were provided with slow chargers, often at low price or even free of charge. For example, Tesco superstores were an early charge point provider in their partnership with Pod point, seen as an incentive to get EV drivers to their stores as their traditional

money off fuel scheme clearly wasn't attractive to EV owning shoppers. However, with the increasing number of electric vehicles on the road and the realisation that the cost to the business of charging can be turned into an earner by charging EV drivers, we have started to see FAST chargers installed at superstores and other locations. Within a couple of hours, a meaningful amount of range can be added to a car, somewhat justifying the relatively high prices. The nature of the location also means that it will typically have a grid connection able to support multiple FAST chargers(2).

(2) These sites tend to have large energy demands and have their own substation directly connected to the Grid. However, if the local grid is at or close to capacity then this might not be possible in the short term.

When I'm away overnight from home I need to be able to plug my car in and have it charge. I also want the costs to be proportionate to the cheaper supply cost of off-peak electricity. In my experience, in all but the big accommodation chains, little thought and hence provision has been put into this need. Sadly, many larger hotels are installing FAST chargers where more SLOW chargers would be a better match to the needs. Yes, have at least one FAST charger for those that are staying just a few hours, but install more SLOW chargers for a greater number of customers staying overnight.

If charging facilities are not available onsite then at the very least the location and access to local chargers should be published as part of the accommodation features. Compared to the UK, this provision is much better in France. On a recent trip to Normandy there was no electric car charging options at the house but the owners added car charging to the house details. There were 2 public charging locations in the town, both within a 3 minute walk. I used the one outside the Hôtel de Ville (town hall) which had free parking, and incidentally accepted my Kia Charge card for a very cheap overnight charge. I would like to see all accommodation owners in the UK provide similar information. It really should be standard information item in the accommodation details.

If onsite parking is available then owners should consider putting in charge points, obviously within the constraints of the site electricity supply. Again, a multiplicity of chargers is good, but just as important is the need to be able to book and pay for use of the chargers. I have yet to come across accommodation that lets you book overnight use of a charger so it's first come first serve, ie not aligned with my need to not to have to worry about charging. Adding the facility booking to the stay should be a simple thing to do, as is deciding how customers pay for the charge. While the larger charging points can be provided by one of the many Charge Point Operators with their own mechanism to pay, typically though membership of their network or increasingly contactless, the smaller "home chargers" don't have a mechanism built in. The owners have to decide whether to apply a fixed charge for electricity (like a camping electric pitch), meter the supply and charge according to actual use, or provide free of charge. However, there are companies like Clenergy that have a software billing solution that monitors charger use (some models) and can generate invoices appropriately.

For some smaller establishments, installing a dedicated charger can be beyond their means. That said, there are grants available to do this. However, providing a properly installed 13A socket specifically for charging using an EVSE, that comes as standard with most EV's, should be considered a minimum requirement. If one is not provided then the EV driving guest is likely to use extension cables running through windows, doors, cat flaps to get their charge and, given the power continuously running through a charging cable, that can be a dangerous option. Again, how the guest pays should be considered, and not leave it to the honesty of the guest. I have a policy of paying over the odds for the actual electricity I use when plugged in away from home, even when staying with family or friends. I have yet to come across a place where this has been explicitly thought about until I ask.

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The bottom line is that charging is getting easier as more chargers are installed. But the number and type of chargers installed needs to be better matched to the usage models, and businesses of all sizes need to start thinking about providing for the electric car driver. It's rare these days for a hotel room not to have a USB outlet for charging our smart phones. We need to make that same transition for electric cars.

Footnote

One of the reasons that EVA Cymru exists is to help explain EV technology, whether it be to prospective buyers, to infrastructure providers or to legislators. We have attended several exhibitions and made numerous pitches to conferences, tourist boards and even to a Senedd committee. Please contact us if you would like any support.