

FORBES > INNOVATION > TRANSPORTATION

GM joins Ford To Switch To Tesla Charging, Killing CCS. Should Tesla Just Run All Charging?

Brad Templeton Senior Contributor ©
I cover robocar technology & previously worked on Google's car team.

Follow

0

Jun 9, 2023, 03:46pm EDT

Listen to article 18 minutes



A General Motors car is depicted in front of a Tesla supercharger thanks to the announced deal GM has ... [+] GM

GM and Tesla announced that GM will also switch from the CCS charging plug to Tesla's NACS and has contracted so GM cars (old and new) will be able to charge at the Tesla

Supercharger network. [Earlier this month, Ford also did this](#). As such, the top 3 American EV makers will all be on NACS, and CCS1 becomes mostly the charging system used by imports. That's a major switch from just a few weeks ago, when it was common for people to declare CCS the settled winner, because all manufacturers except Tesla used it — though at the same time Tesla NACS was used by about 2/3rds of drivers. It's drivers who matter, not manufacturers.

With this shift, the margin for NACS (Tesla has given up ownership of the plug spec but it still runs and owns the supercharger network) will be overwhelming, and the death of CCS is almost assured. Because NACS cars can use an adapter to charge at CCS stations, drivers will gravitate to cars which can charge at all charging stations (Tesla and CCS) vs those that can only charge at CCS stations and the 10% of Tesla Superchargers planned to support CCS cars.

There's a big wrinkle, though. The governments are firmly behind CCS. The main reason the largest CCS station network, Electrify America, exists is due to the settlement by VW over the dieselgate scandal. Most other CCS networks were built largely with subsidies, and new massive rounds of subsidies of as much as \$7B have been allocated, and the current regulations are written to require CCS, and also require 20th-century style gas station functions which Tesla does not support because their designs are more modern and customer-friendly. Tesla is hoping to get some of those billions, and with the top 3 US manufacturers supporting NACS, it seems very likely that the regulations demanding CCS will eventually be modified to be friendlier to NACS and Tesla style of "plug and play" stations which share power and do not have screens or credit card readers. For now the stations built will be those that support NACS and CCS. Eventually, as adapters become available for older CCS cars, they will need to only support NACS.

Now, NACS is the standard of US Automakers, except Chrysler. CCS is the standard of imports. It seems very unlikely that the government mandates for CCS will persist in that situation.

The past failures

The US Federal Government and many states have made massive efforts, including over \$7 billion in funding, to build out EV charging infrastructure to assist the EV transition. In spite of this money — because of this money — they haven't remotely done a good job and don't look primed to do one. Tesla, on the other hand, knowing it needed to create charging infrastructure to get people to want their cars, built bigger, superior infrastructure largely with their own money. Even the non-Tesla players concede this, though they hope to do better. We clearly could have done better, and we want to in the future, but how can we?

MORE FROM [FORBES ADVISOR](#)

Best Travel Insurance Companies

By **Amy Danise** Editor

Best Covid-19 Travel Insurance Plans

By Amy Danise Editor

The government's duty is to serve the people and the public interest. They are not supposed to subsidize one company or pick one winner. Indeed, they shouldn't even be picking EVs as the winner — they should instead be discouraging, or at least stop subsidizing, highly polluting fossil cars as they did in Norway — but that's not politically on the table in the USA.


Forbes Daily: Get our best stories, exclusive reporting and essential analysis of the day's news in your inbox every weekday.

Sign Up

By signing up, you accept and agree to our [Terms of Service](#) (including the class action waiver and arbitration provisions), and [Privacy Statement](#).

Tesla has demonstrated they know how to do it better. Their charging network is the largest and most capable. It has the best reliability and uptimes, and not by a small margin. Their equipment is sleek and efficient compared to the vastly bulky CCS connector developed by the old-school gasoline OEMs. Their fast charging stations, they disclosed in their recent Investor Day, cost 1/4 to 1/3rd the cost of competing stations to install. Their home charging stations are high quality, fully featured and cheaper than the rest of the industry — even though with Tesla being the only supplier for their previously proprietary connector, they could easily have made them a premium cost product. Because Teslas are around 70% of EVs on the road, the Tesla connector is the most widely used by drivers.

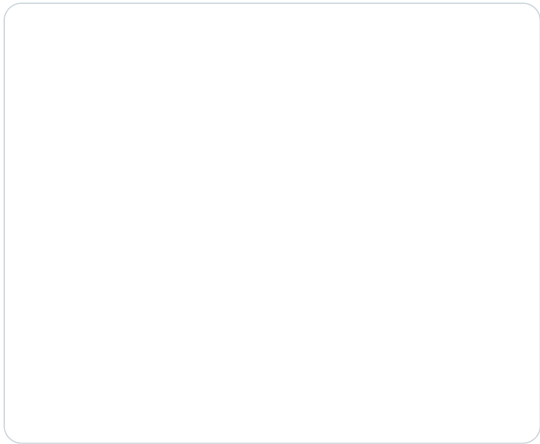
The government's interest is to serve drivers, not car and charging companies. While the other two plugs — J1772 for slow charging and CCS1 for fast charging are used by most other manufacturers, even all together they are used by fewer drivers than Tesla's. (The CHAdeMO fast charging plug is used by the Nissan Leaf and a few others but is fading off.) It's interesting to ask what best qualifies as a standard — the one used by the most car companies, or the one used by the most drivers?


EVAoption 
@EVAoptionTweet · [Follow](#)




Tesla continues to lap the other US DCFC networks, having installed nearly 1,300 DCFC ports in Q1 2023 or 59% of all new DCFC ports.

At current pace, Tesla should install ~5,200 new DCFCs in 2023 and all networks combined roughly 8,700.

Tesla now averages 13.2 chargers/site.



4:39 PM · Apr 3, 2023 

 227  Reply  Share

[Read 18 replies](#)

This was complicated by the fact that Tesla’s connector was proprietary. Tesla declared its patents could be freely used but left a few small avenues closed that kept their cord from being fully open. It didn’t help that they were the upstart and the others were the incumbents, who were cooperating via a standards body as you might imagine they should. In 2022, Tesla declared their connector to be fully non-proprietary, but most people felt it needed to do this sooner to make a difference. In addition, their fast charging

network is still mostly proprietary, except for a few stations (and a pledge to build out 3,500 more dual stalls this way in the next 2 years.)

Free money can make things worse

Tesla's approach did not attempt to view charging as a business. To this day, it remains very hard to view charging that way. But they didn't view it as a public good, either — they worked on it to sell more cars, because they know that people won't buy their cars if charging is going to get in the way of enjoying them. Their initial approach had three prongs:

1. Reasonably priced equipment for installing charging at home, including a flexible mobile charger included free with each car that can plug into just about any useful plug
2. The donation of charging equipment to hotels, which usually then provided electricity free to Tesla-driving guests
3. Easy to use, dependable high-speed charging outside of cities to facilitate road trips — with unlimited free use

As you might surmise, free charging isn't a business. But Tesla was motivated to build out this network and put the charging in useful locations, and maintain it for good reliability. At the same time, government grant programs funded the installation of public J1772 (slow level 2) charging at near 100,000 locations and later, subsidies for fast charging. Most of these stations are in fairly useless places and are thus very rarely used. Chargepoint published statistics a couple of years ago that showed their typical station saw only one car every 2-3 days. A few, which ended up in commuter parking lots get solid use — particularly when free — but many showed up in places people only park for a short time, which aren't nearly as useful.

Charging needs to go in private locations

With gasoline thinking, you go to public stations and fill up when empty. For EV thinking, you charge where you are already parking. Most cars are parked 23 hours/day and need less than 2 hours/day of Level 2 "slow" charging or 8-10 hours/day of Level 1. If you can get charging in the places cars already park, you need very little fast charging and nobody has to worry about staying charged except on intercity trips.

The problem is that most of the places cars park are private — homes, offices, and apartment buildings. Only a little time is spent at stores, public parking lots and curbside. The government wanted to subsidize charging but it doesn't fit the usual mold to subsidize private locations, though they did do some of that. What they didn't understand, due to gasoline thinking, is that should have been almost all of it.

To make it more complex, we're about to see a big change. As we move our grid to solar power, cars want and need to charge from 9am to 2pm when solar power is going spare

and cheap. That's mostly office/commuter lots and some residential lots for those who don't commute.

How to get the right charging

Governments could just provide massive subsidies — as they are doing now — except for allocate them for useful, private location charging. But politically that looks wrong. Early EV adopters were richer folks, and while that's going to change, they don't want to be subsidizing mostly upper middle-class homeowners and employees. It would look a little better to subsidize apartment blocks and even condos. Sadly, throwing away money (which is what they have done) seems to have superior optics — it looks like they are doing the green thing by putting a charger at the mall.

Public, fast chargers are needed along roads and at tourist stops out in the country. There is not much escaping that. But the most useful charging for road trips is actually at hotels, which is what Tesla worked on. Again, that looks like giving things to private businesses but it's where drivers want to use Level 2 charging.

We're also seeing public fast charging in cities to serve those people who can't yet get charging at home or work. They get a 2nd class experience, but otherwise they can't have an EV at all. Even so, we should work to get them charging where they actually can use it while parked.

If grants don't work, loans might make sense. Loans also cost the government almost nothing, depending on the interest rate. One idea is to loan all the money for charger install, and require it to be paid back as the charger is used and saves drivers money, with some minimum rate to avoid giving loans for never-used chargers. If you put a charger in your home and switch from gasoline, your energy costs can drop from 14 cents/mile to 4 cents/mile in a typical case. A typical 1,000 mile/month driver might pay back \$100/month — that makes them break-even with their old gasoline cost, but in a year, it's paid for and savings roll in. (If you ask for only \$50/month, then those drivers are saving money from day one with their EV, and even more after 2 years.)

It's also important to charge at level 2 because that's cheaper. The national average rate for electricity in homes is around 13 cents/kWh (~4 cents/mile in a sedan.) At fast chargers and public chargers it's 32 to 50 cents/kWh, which doesn't save compared to gasoline in a hybrid. Making it cost this much is no way to encourage the EV transition.

Make it easier and cheaper to build

The existence of the subsidies has a bad unintended consequence. It drives the price up. As was noted above, Tesla puts in unsubsidized stations for 1/3rd the price for subsidized ones. To have an EV transition, we need low cost. Tesla has now been building their fast charging stations as 4-pods that are shipped in on a flatbed truck, so they have less of that very-expensive on-site construction work. Basic level 2 chargers are really just fancy electrical cords — they contain almost no electronics. In spite of this they often cost \$500

and other work can cost \$1,000 or more. In addition, many locations find they need to upgrade their electrical service which can cost many thousands of dollars. In reality, they don't need to upgrade the service at all, it's just outdated electrical codes and thinking which push that requirement, and frankly electricians don't mind the extra business. (Disclaimer: I have an investment in a company which builds a tool to allow charging stations to make use of spare power in a building so that no upgrade is needed, an idea I pushed years before that company existed.) We need to change the rules to make install of charging in all these private locations cheaper — even if it's paid for with a loan, or a loan+grant.

Putting Tesla to the task

Tesla has done a vastly better job at deploying all types of charging than anybody else. They are so much better at it that it doesn't make sense — one company should not be so different from others when there are no big proprietary secrets. From a 30,000 foot view, the country would be far better off if they had just been in charge of doing charging for everybody, at least based on results. But the government should not pick a company as the only winner — competition should still reign.

Instead, rulemakers should just look and see what systems are working the best, and demand that level of performance. At first, only Tesla would be able to meet those standards for cost, quality and reliability. The other companies would need to struggle to catch up if they want a piece of that pie, and that's what we want them to do.

Instead, we've crazily done the reverse. The new "NEVI" grant program has almost \$5 billion to pay for more fast charging along the highways. The NEVI rules were written as a complete mismatch for Tesla's superior station design, so Tesla's stations can't qualify for these grants, even the ones which use the "standard" CCS1 plug used by non-Tesla cars. Once again, huge grants are being offered to subsidize those who do it wrong. (As noted, with Ford and GM switching, fewer cars will use CCS1.)

NEVI rules expect a station with 4 stalls. Each stall must be able to offer 150kW independently of the other 3, so that all 4 might be offering 600kW in total. Usual interpretations of the rules (which are enforced by states) demand credit card readers and screens, which Tesla does not put on its stations.

Tesla never did a 20th century, "gas pump" style design. They built a "plug and play" system where drivers just plug in and walk away. Drivers absolutely love it — the biggest cause of charging problems at non-Tesla stations involve billing and authentication. Tesla's approach is proprietary, and demands an account with Tesla, and as such the instinct is not to subsidize it but the real answer was to just require the system open up for easy access by all, not to demand a 20th century gas pump style.

The flaw in the "150kW per station" approach is more subtle. Tesla builds larger stations, with rarely fewer than 8 stalls, and often dozens of them. Among other things, it means if

one stall is broken, it's only a minor inconvenience to drivers. With 4 stalls (or, as is fairly common, 2) a broken stall can cause a major burden.

When cars charge, they only take full power when they are low, when they start out the session. Within about 10 minutes the power delivered drops. Tesla knows that each car at the station will have arrived at different times, and will be able to take a different amount of power. Having 8 stalls and 600kW is better than 4 stalls with 150kW assured to each stall. Yes, it's possible that 8 cars might all be low and get 75kW each, but in reality you will have all 8 cars getting all or most of what they can take. If you only have 4 cars, they can all get 150kW. But if you're the 5 car who arrives, at the 8-stall station, you will probably get 100kW or more, while the other 4 get a bit less. At the 4 stall station, the 5th car starts a line and sits and waits. You would much prefer rare slightly longer charges to having to be in a line any day. In fact, Tesla will put enough on the larger stations so everybody is happy. But Tesla's superior design won't qualify for the subsidy, and in at least one place they have decided to forgo it rather than cripple their design. That's the last thing the public should have wanted.

Switch to Tesla Connector

Tesla is, to get some subsidies, putting an adapter on some of their stations to let CCS cars charge there. It works, though there is a problem with cord length. The reality, though, is that the smart thing for the USA to do would be to standardize on Tesla's connector. It's the one found on the most cars (by a large margin) and on the most fast charging stalls (though that's getting closer to even.) With the connector opened up, it will be fairly easy for CCS charging stations to add a cable for it. There is also an adapter that costs under \$200, which could be placed at old stations to borrow, or bought by cars with Tesla's NACS. A reverse adapter could also be provided. Carmakers would probably switch to Tesla NACS if they were given access for their drivers to Tesla's current full network. That is, if Tesla is willing to give that — today it is a big proprietary advantage to their cars, and means that if you want to do long road trips, a Tesla is still by far the best car choice.

Tesla's NACS is superior in every way. It is a fraction of the bulk, and the same connector does both slow and fast charging. They have now updated it to handle a megawatt (previously CCS handled 350kW with a slight edge over the Tesla 250kW maximum.) It's cheaper to make and cheaper to make adapters for.

It would have been much easier to do this switch a few years ago, but Tesla was still holding a few proprietary strings on their adapter design. It's still the right thing today. If I were a car OEM selling EVs, and I could put the Tesla connector on it instead of CCS, and get my customers access to Tesla's full supercharger network, I would do it in a heartbeat. Customers would definitely prefer my car. This has driven Ford and GM to switch. Others are likely to follow suit. We have the chance to chart a course to a world where there's charging in lots more places, and it just works, and most importantly it's in the places that make sense. If the government can see the error of its prior path, that is.

Follow me on [Twitter](#) or [LinkedIn](#). Check out my [website](#).



Brad Templeton

Follow

I founded ClariNet, the world's first internet based business, am Chairman Emeritus of the Electronic Frontier Foundation, and a fellow of... **Read More**

Editorial Standards

Reprints & Permissions

Join Our Conversation

One Community. Many Voices. Create a free account to share your thoughts. Read our community guidelines [here](#)

Commenting as **Guest**  [Log in](#) [Sign up](#)

Be the first to comment...



No one seems to have shared their thoughts on this topic yet

Leave a comment so your voice will be heard first.

Powered by  OpenWeb

[Terms](#) | [Privacy](#) | [Feedback](#)