

Katerina Downard
Environmental Policy Office
438 University Ave, 12th Floor
Toronto, ON
M7A 1N3
Canada

11/4/2022

Building public electric vehicle charging infrastructure – ERO number 019-6000

Dear Ms. Downard,

We appreciate the opportunity to provide comments regarding the recently announced funds for the deployment of electric vehicle (EV) charging infrastructure in Ontario. Tesla is supportive of the efforts being made by Ontario's Ministry of Transportation (MTO) to expand the availability of charging infrastructure in the province.

At the outset, Tesla wishes to clarify the definitions it uses in this letter to describe aspects of the charging ecosystem:

“Charging Station” means a *geographic location* where one or more charging connectors are deployed.

“Charging connector” means the individual connector (the charging “post”) located adjacent to an EV charging stall, connecting the power to the vehicle. Often referred to as Electric Vehicle Supply Equipment (EVSE).

“EV Infrastructure” means collectively all the EVSE, switchboards, transformers, and other ancillary equipment required to operate an EV charging station in full, including but not limited to site communications/data, and charging connectors.

At Tesla, we believe that our technologies and charging solutions are especially well-positioned to help maximize charging deployments and, in summary, we propose the following:

- Expanding the program scope and focusing on gaps in public EV charging needs, including:
 - Where highway-side DC Fast charging infrastructure is already present but additional capacity is necessary.
 - Supporting urban charging infrastructure, particularly Level 2 AC charging in multi-unit residential buildings.

- Developing DC-Fast charging hubs in densely populated areas to serve as a backstop until multi-unit residential retrofits are completed, by making public lands available for this use to charging operators and drivers.
- Where no charging operators are currently operating any service in contiguous corridors (e.g. highway 11 between North Bay and Nippigon)
- Adopting minimum power requirements to deploy DCFC equipment rated at a minimum 100 kW output per connector
- Including the Tesla connector within the design of the program, just as it has been done by Natural Resources Canada, in recognition of Tesla's proven capacity to deliver sites on time, on or under budget, at scale, and for all vehicle drivers alike.
- Adopting reliability requirements to ensure stations deployed are dependable and fulfilling drivers' needs.

Tesla has proven that it is possible to scale EV charging deployment while also continuing to lower equipment costs while maintaining an excellent customer experience. We believe this will contribute substantially to Canada's deployment goals and enable government to demonstrate progress quickly. Given Tesla's global and Canadian experience – to date we have deployed 1,490 DC Fast charging connectors and over 2,100 Level-2 connectors in Canada – we believe we're well positioned to support your department's goals. Maximizing the number of charging stations deployed with public dollars is vital in the fight against climate change, will help avoid the economic costs of pollution, will save lives and reduce pollution related diseases.

To maximize dollars, and to drive further competition in the market, any grants offered should be established on a flat dollar per connector basis, rather than funding a fixed percentage of a project to a maximum dollar amount. The former will encourage manufacturers and operators to optimize services to reduce costs, while the latter approach could encourage operators to optimize site design for maximum incentive benefit, rather than lowest project cost.

1. Where are the geographic areas in Ontario where there are gaps in public EV charging infrastructure?

Regarding the program's focus and scope, Tesla recommends the following three priorities:

1.1. Focus on remote/low utilization sites, but also on sites where additional capacity is needed.

The program design shouldn't underestimate the importance of *capacity*, in areas where EV charging exists, but is insufficient to meet demand. Expanding the

capacity of existing sites is essential in areas where demand can be evidenced. Prioritization should not be limited to just putting points on a map for geographic distribution. Such sites may lie on high traffic corridors across Southern Ontario, or near dense urban areas.

Remote and low utilization sites, such as in rural and Northern Ontario, often pose a hard economic case for private sector investment. Supporting the deployment of charging infrastructure in these areas will also be key to rendering investments economical for smaller private sector players.

1.2. Expand program scope and support investments in charging infrastructure in multi-unit residential buildings

Target EV infrastructure investments where they will have the greatest impact: existing multi-unit residential buildings.

Tesla applauds the Government of Ontario's commitment to investing in EV charging infrastructure. However, based on our experience in engaging with prospective EV drivers in Canada, the most significant challenge facing EV charging infrastructure at this stage in the market's development is not with highway-side or other public charging, but with access to charging at home, in multi-unit residential buildings (MURBs).

According to Statistics Canada's 2021 census, approximately 3.33 million Ontarians, or just under one-quarter of all Ontario residents, live in multi-unit dwellings, including apartments and condominiums.¹ Since 90% of charging typically takes place at a driver's home, ensuring that the occupants of those multi-unit dwellings have a place to charge where they already park the majority of the time would offer the Government of Ontario the greatest return on its charging infrastructure investment. This is an Ontario-wide challenge and would benefit from provincial leadership.

It has been demonstrated that the private sector is willing and able to take the lead in developing public charging infrastructure. The Government should focus public dollars where the EV charging market is most nascent: in apartments and condominium settings. The initiative recommended by Tesla would not fund charging connector installations. Rather, grants would subsidize up to 75% of the costs associated with:

¹ Statistics Canada. [Table 98-10-0040-01 Structural type of dwelling and household size: Canada, provinces and territories, census metropolitan areas and census agglomerations with parts](#)

- a building's electrical power capacity upgrades;
- electrical room retrofits; and
- electrical sub-panel installations throughout parking garages, such that every parking stall is within a reasonable distance of a sub panel (max. 30 meters to ensure no single resident has to carry a disproportionate cost to connect their stall).

This will have the added benefit of enabling millions of Ontarians to access EVs and supporting Ontario's clean air and climate change goals.

1.3. Support public charging installations in urban settings, especially where it provides EV charging for MURB dwellers

Support the establishment of DC Fast "charging hubs" in Ontario's most dense and expensive real estate markets as DC fast charging is not otherwise economical to develop in those settings.

Developing DC fast charging is challenging. It becomes even more challenging when working in Canada's most expensive urban real estate markets. In these markets, the following challenges often emerge for charging operators:

- Multiple competing land uses interests;
- High costs of land;
- Demands for high rent or site access fees that undermine the ability of charging operators to recover costs;
- Power restrictions; and
- Gated, fee-based parking garages that undermine economics of EV ownership and deliver few charging customers.

1.4. Provide a stopgap, while building retrofits take place, by making land available for public charging hubs.

For those without EV charging in their condominium, apartment or at their house (where street parking is often the only option), purchasing an EV can be a challenge. To address this, Ontario could take the lead in identifying and preparing two or three parcels of land in each of Ontario's highest-cost real estate markets that could be established as "Charging Hubs."

In this proposal, a Charging Hub is a site with between 30 and 50 parking stalls that is owned or facilitated by the Government, and which has on-site power capacity

(only) for EV charging stations. The intent would be to allow charging operators to establish themselves in the Hub without a fee, but they would pay for the full capital cost of their equipment, its installation, and electricity submetering. The charging operator would also pay the full operating cost of electricity consumed by their equipment and cover all maintenance and other operating costs associated with their equipment on an ongoing basis.

Government would make the site available for 10 years. At the end of the 10-year period, the government would continue to own a significant and well serviced parcel of land that could be maintained as a charging hub or sold when the EV charging market becomes more mature.

Charging hubs further encourage price and service quality competition. For this reason, it is vital that no exclusivity ever be offered to any charging operator on the site. These facilities should be inclusive and welcoming to all EV drivers and vehicle brands. They would ideally be situated near good amenities.

To achieve this outcome, Ontario could work with provincial and municipal entities which have access to publicly-owned land.

2. In what kinds of situations are public EV chargers most useful (e.g., type of trip, length of trip, type of charging location)?

There are two main categories of charging that will benefit Ontarians: Level 2 and DC Fast Charging (DCFC). While level 2 connectors are adequate where drivers park for extended periods of time (e.g., at home, at workplaces), the reality is that more DC fast charging is required to support convenient and fast charging for travellers on the province's highways and occupants of multi-unit residential buildings who do not have access to a private or shared level-2 connector and where it will be difficult to provide access in the near term. Increased access to DC Fast charging across the province will ensure that electric vehicle fulfill the needs of more Ontarian drivers.

To meet such goals, adequate DC fast charging infrastructure is needed.

2.1. Require minimum 100 kW for DC Fast infrastructure eligibility to funding

Considering the types of situations in which EV drivers use DCFC stations, primarily on longer trips or when they do not have access to level 2 charging at home, these stations need to be convenient and offer truly fast charging.

To ensure mass adoption of EVs, day-to-day trades offs to consumers moving from ICE vehicles to EVs must be minimized. Most importantly, access to charging options must be as convenient as gas refueling as possible; they must be fast, accessible and easy-to-use. Public funds should be directed to the deployment of technologies that most effectively achieve this goal, for which we encourage a threshold of DC Fast charging technologies with a rating of at least 100kW.

Early EV models were mostly compact vehicles and sedans with limited range. Today, a more mature EV market sees a large diversity in EV makes, including larger vehicles such as SUVs and pickup trucks, with increasing driving ranges. With longer range often comes larger batteries, and more demand for faster DC fast charging rates for drivers' convenience.

According to a Harvard study, a 150kW DCFC provides ~200% more range added per minute of charging compared to a 50kW DCFC, and a 350kW connector provides ~600% more than a 50kW DCFC.² With an EV charging market and vehicles providing ever-increasing kW capabilities, public funds should incentivize the deployment of the technologies with lower charging times to ensure greater convenience to EV drivers.

Requiring a minimum rating of 100 kW incentivizes the construction of DCFC posts that can serve more EVs in the same amount of time. With faster charging technologies available, the Government should subsidize only those with >100kW to avoid potential capacity issues, longer lineups and less optimal experience for EV drivers that DC fast charging posts under 50 kW —combined with increased EV fleet size and demand at public EV charging stations—can create.

DCFC stations under 100 kW should not be eligible for funding. Given their cost and the limited benefits to EV drivers, they are not an efficient use of public funds to accelerate the adoption of electric vehicles in Ontario.

2.2. Connector requirements

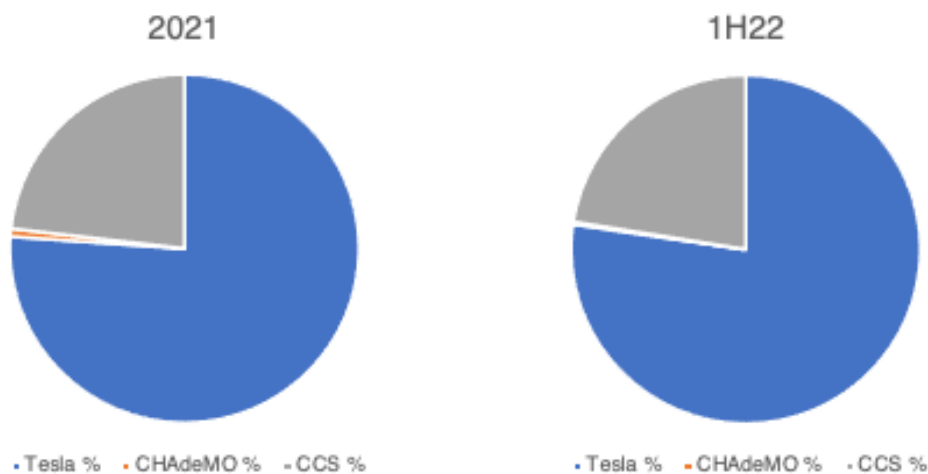
Today, there is no single DCFC connector that can serve all EVs in Canada. There are currently three DCFC connectors utilized in North America: CCS, Tesla, and CHAdeMO, however, the CHAdeMO standard is being phased out in North America. This leaves CCS and Tesla as the predominant connector types in North America. While the Tesla connector

² [Charging the Future: Challenges and Opportunities for Electric Vehicle Adoption. Henry Lee and Alex Clark Harvard Kennedy School. Table 2.1, p. 23.](#)

is currently only used by Tesla vehicles, Tesla vehicles are the majority of DCFC-capable vehicles on the road, whereas most new EV models utilize CCS.³

CHAdEMO, a standard used by only one major automaker in North America until recently, is now a legacy standard. In the summer of 2020, Nissan announced that it was abandoning the CHAdEMO standard in the North American and European markets. As such, Ontario should follow the lead of Natural Resources Canada, which abandoned the CHAdEMO requirement from its EV charging infrastructure program in 2021. This will result in more economical deployment of connectors and use of government funds and will avoid government investing in infrastructure that is effectively now obsolete.

Battery Electric Vehicle Sales by Connector Standard - Ontario⁴



Tesla would support a minimum Combined Charging System (CCS) connector type requirement, meaning each DCFC site must have at a minimum a permanently attached CCS Type 1 connector and must charge any CCS-compliant vehicle. Such a requirement should provide flexibility for the provision of charging ports after the CCS requirement has been met. This includes adding permanently attached proprietary connectors or new connector types to DCFCs, thereby enabling all charging connector types to participate in the program.

³ Tesla has previously publicly indicated that it is open to other automakers utilizing the Tesla connector. In the May 2018 earnings calls this was discussed.

⁴ From a Tesla internal analysis. These charts show charging standards for battery electric vehicles sold. BEVs are the only type of vehicles that must stop to charge along their journey. There is only one PHEV available in the North American market which is equipped with DC-Fast capabilities (sales data is not available for this model).

To serve as many vehicles as possible with Ontario funded stations, it is important that EV charging station operators are not precluded from including additional charging capabilities beyond CCS. The industry is evolving quickly, and it is understandable to use CCS as the baseline requirement while allowing for additional charging capabilities where EV charging station operators choose to make those investments. Beyond meeting the requirements for rebated connectors with CCS capability, charging station operators should be able to install additional non-rebated connectors if they so choose.

3. What are the challenges with increasing public EV charging in Ontario and how could the government help address those challenges?

3.1. Reliability

Tesla recommends adopting minimum uptime requirements for Ontario funded connectors. Generally, uptime should be calculated at a site (station) level and not focus on a per port or per stall level.

Government should aggregate reported port uptime provided by charging operators to the site (station) level before releasing it to the public. Publishing data that an individual site is up at least 97 percent should be sufficient to provide drivers confidence that Ontario funded sites will be available when they need a charge. Further, in evaluating uptime it is important to consider site redundancy, as one of the advantages of larger sites is that there are many ports available to customers in case there is an issue with a particular port.

3.2. Utility connection costs and timelines

Inconsistent and unclear utility scope of work, high costs and long timelines is a barrier to fast deployment of EV charging infrastructure.

Tesla has more experience deploying and operating charging infrastructure than *any* other company in Canada and is experiencing some challenges in Ontario that are slowing our ability to deploy Superchargers and increasing costs.

Part of the deployment process for DCFC infrastructure requires that charging network operators like Tesla work with utilities to prepare each site for service connection. Tesla's experience in Ontario demonstrates that Local Distribution Companies (LDCs) are applying an inconsistent approach to line extension costs and scope of work for site preparation of Superchargers, making Ontario **more complicated and costly** compared to other

jurisdictions in Canada. In some cases, the interconnection process also significantly delays charging infrastructure projects.

Tesla is seeking the Government of Ontario's support to streamline the LDC interconnection (new service) process for EV charging stations through:

- a codified and standard approach to scope of work for LDCs and customers
- a transparent approach to cost assignment
- a consistent mechanism for deposits and formula for cost recovery

The Ontario Energy Board is best positioned to develop these solutions alongside charging network operators and utilities. We would welcome the opportunity to discuss this challenge further and support the Government of Ontario in developing these solutions.

Resolving these issues will help speed up the installation of charging infrastructure to meet consumer demand and demonstrate Ontario has a strong investment climate for EV related industry.

To conclude, Tesla supports the Government of Ontario's initiative to accelerate the deployment of EV charging infrastructure in the province where EV charging is most needed. Such programs are key to accelerating the uptake of EVs in both personal and commercial vehicle markets, meeting Ontario's greenhouse gas emissions targets, and creating a healthier, greener Ontario.

To maximize the efficiency of the public dollars invested in the program, the Government must prioritize investments that will truly help deploy critical EV charging infrastructure in areas that help make charging fast, accessible, and as convenient as gasoline refueling as possible. Specifically, the Government should:

1. Focus on remote and low utilization sites, but also on sites where additional capacity is needed.
2. Expand program scope and target EV infrastructure investments where they will have the greatest impact: existing multi-unit residential buildings.
3. Support public charging installations in urban settings, especially where it provides EV charging for MURB dwellers, and the establishment of DC Fast "charging hubs" in Ontario's most dense and expensive real estate markets (where DC Fast is not otherwise economical to develop in the market's current nascent stage)
4. For DC Fast eligibility, require minimum rating of 100kW. Considering the types of situations in which EV drivers use DCFC stations, these stations need to be convenient and offer truly fast charging.

5. Adopt minimum uptime requirements for Ontario funded connectors (calculated at a site (station) level).
6. Work with the Ontario Energy Board, utilities and service providers to address inconsistent and unclear utility scope of work, high costs and long timelines that are significant barriers to fast deployment of EV charging infrastructure.

* * *

Tesla's mission is to accelerate the transition to sustainable energy through the development of all-electric vehicles and clean energy products including photovoltaic solar and battery storage. Tesla has manufacturing facilities globally, including in Canada. Tesla's vehicle line-up includes the Model S sedan, Model X crossover vehicle, Model 3 sedan, and Model Y crossover vehicle. Tesla has delivered over 130,000 vehicles in Canada. Tesla also owns and operates an extensive Supercharger network of direct current fast chargers (DCFC) with over 3,500 stations and nearly 40,000 Supercharger connectors deployed globally, 1,490 of which are deployed in Canada.

Tesla has over 1,300 Canadian-based employees in sales, service, delivery, advanced manufacturing, research & development, engineering, infrastructure deployment, and more. Tesla operates three research and development facilities in Canada (Mississauga, Richmond Hill and Dartmouth) that are enabling breakthroughs in battery longevity, cathode materials and advanced manufacturing.

There is a bit of Canadian innovation in every Tesla: our manufacturing plants in Richmond Hill and Markham design and engineer the battery assembly line equipment deployed to our factories around the globe. Tesla vehicles also contain Canadian-made parts. Since early 2018, Tesla's direct and indirect economic contribution to Canada for supply chain, infrastructure, employment, and R&D exceeds \$830 million.

Thank you for your consideration on these matters. I would be pleased to answer any questions you may have. I can be reached via email at adepault@tesla.com.

Yours sincerely,



Audrey Dépault

Senior Advisor, Public Policy and Business Development