The BC Electric Vehicle Infrastructure Project: DC Fast Charging

The British Columbia Electric Vehicle Infrastructure Project was launched in 2012 to support the mass adoption of electric vehicles in the province by addressing one of main barriers to adoption, the lack of public refuelling infrastructure. The project is led by BC Hydro and supported by the province of British Columbia, the federal government, municipalities and the private sector.

The BC EV Infrastructure Project, also known as the EV Experiment, supports the installation and operation of approximately 500+ level 2 charging stations for public use in urban areas across the province and 30 DC fast-charging stations along major transportation corridors.

WHAT'S IN A CHARGE?

Most electric car charging in Canada has zero out-of-pocket cost to the consumer. However, there is of course a cost to buy the charging station, install it, get permits to install it, develop signage for it, etc.

DIFFERENT TYPES OF CHARGING

Level 1 (120v, 1kW)	Level 2 (240v, 3-6kW)	DC Fast Charging (50kW)
• Cost = $200-$2,000	• Cost = $1,000-$2,500	• Cost = $50,000-$100,000
• 1 hr charge = 5-7km range	• 1 hr charge = 15-30km range	• 20 min charge = -80% (~90+km range)
• Use = home or Emergency trickle charge	• Use = home, work or on the go parking	• Use = long distance trips

DC FAST CHARGING HOSTS

In BC, you have to register as a utility in order to re-sell electricity, which is quite onerous

given the uncertain business prospects of operating a single DC fast charger. There are some exceptions such as landlords can resell to tenants and municipalities can resell within their jurisdiction. The latter was identified as the most suitable model for implementation at this time. For this project, the municipalities are considered the DC fast charging "hosts".

If hosts who install charging stations decide to recoup their investment and operating costs, there needs to be a viable business model for operating charging stations so that charging station networks exist far into the future.

Hosts can also assume the cost into their municipal budget as a service to the community and as an investment for economic development– it is up to each host. For example, a DC fast charger in a community has the potential to attract "EV tourism".

DC FAST CHARGER OPERATING COSTS

In addition to the upfront costs presented in the table above, **DC fast chargers** have operating costs:

- Variable costs include electricity @ $2 per a typical fill (about 20kWh) and a $0.91 transaction fee. These can be passed directly onto the customer.
- Fixed costs amount to $1,500 annually. The three main components include: $1,000 in utility charges, the bulk of which are *demand charges*[1]; $260 for the charging station network management system, which provides remote data collection, monitoring, payment processing and call centre; and general maintenance. These costs need to be repaid over the number of customers over a year.

For the purpose of this pilot DC fast charging project, all hosts have agreed to implement a **$0.35/kWh** charge with a minimum $2.00 sales per charge session. The minimum sales amount ensures the recovery of the $0.91 payment transaction fee and any electricity (kWh) dispensed before reaching the $2.00 mark.

[1] A charge for your highest rate of energy usage in a billing period.

FAQ

Q: WHERE DO I CHARGE MY EV?

Most people charge at home or at work while their cars are parked. There are over 650 free public charging stations in BC (the most in Canada). Public DC fast chargers serve as “EV gas stations” for longer trips.

Q: HOW MANY DC FAST CHARGING STATIONS ARE THERE IN BC?

The DC Fast Charging Pilot Program is part of the Clean Energy Vehicle Program (launched in May 2012) designed to provide British Columbians with more affordable clean transportation options. By March 31, 2016, there will be a total of 30 DC fast charging stations added to BC’s charging network. As of July 2014, there are seven DC fast charging stations available for use with another six being installed by December 2014.

Q: WHO IS FUNDING THE DC FAST CHARGING STATIONS?

The funding comes primarily from the Province of B.C. and the federal government.

In January 2013, the Province of B.C., along with BC Hydro, announced the Clean Energy Vehicle program that will help electric vehicle owners across British Columbia.

(Link to news release: http://www2.news.gov.bc.ca/news_releases_2009-2013/2013ENV0002-000067.htm)

On July 14, 2014, the federal government announced it was investing over $4.1 million to support the British Columbia Electric Vehicle Infrastructure Project Through the ecoENERGY Innovation Initiative (ecoEII).

(Link to news release:
http://news.gc.ca/web/article-en.do?nid=867749)

Q: WHERE ARE THE CURRENT DC FAST CHARGING STATIONS IN BC?

There are eight sites in BC to fast charge your EV:

Duncan – Island Saving Plaza

- Nanaimo – VI Conference Centre
- Langley – Events Centre
- Surrey – Museum
- Surrey – Powertech (9am-4pm , Mon-Fri only)
- Merritt – Visitor Information Centre

- Squamish – District of Squamish
- Kamloops – Hillside Stadium

***** pilot pricing began – July 21, 2014

Each host will be rolling out pricing at their station at different times. Visit Plug-In BC for updates.
Visit http://www.plugshare.com/ for a map of these stations.

There are another six DC fast charging stations being planned in Vancouver, North Vancouver, Hope, Saanich, Sidney and Sechelt.

The remaining 17 will be determined based on a range of factors including distance between stations and completing a full corridor loop in the Southern Interior.

Q: WHAT DATA WILL BE COLLECTED at THESE DC FAST CHARGING STATIONS?

No personal information is being collected. Information about each charging session such as time of charge and the amount of energy used will be gathered for analysis.

Q: WHAT ARE THE CONSIDERATIONS IN CHOOSING A DC FAST CHARGING SITE?

Drivers want to be able to charge at home, but to overcome range anxiety they will want access to quick and convenient charging on the road as well.

Sites are determined based on a range of factors including distance between stations, main transportation corridors (i.e. Sea to Sky highway), and community interest.

Q: WHY IS THERE A CHARGE FOR DC FAST CHARGING NOW AND WHERE DOES THE MONEY GO?

Although most charging will be done at home, DC fast charging ensures drivers can conveniently top up when they need to away from home and on longer trips.

While government funding supports the purchase and installation of charging infrastructure, the $0.35/kWh fee will help to recover some of the operating costs that hosts will incur.

This fee will ensure there is a sustainable infrastructure that survives beyond government support. Specifically the fee will help recover operating costs such as the demand charges and network service fees. However, at this time, due to the small but growing number of EV drivers using DC fast chargers, these fees are not expected to cover these operating costs yet

Q: WHAT IS THE PLAN FOR SAE (CCS) CONNECTORS FOR THE PROJECT?

The DC Fast Charger (DCFC) standards battle is reminiscent of the classic Beta/VHS battle and it is difficult to pick winners.

Nissan was first to market in 2011 with an all battery electric vehicle as well as a DC fast charging standard, CHAdeMO.

The American auto manufacturers introduced a North American standard for fast charging under the umbrella of the Society of Automotive Engineers (SAE). The standard is referred to as Combination Charging System (CCS). However, DC fast chargers for the CCS standard did not become available until the summer of 2014, along with CCS electric vehicles.

At the time of the initial procurement of DCFCs for this project, March 2013, only CHAdeMO stations were available. Therefore, the initial wave of DCFC installationS will only offer CHAdeMO fast charging. The remaining procurement of DCFC units will be dual standard (CHAdeMO & SAE CCS) stations, depending on availability and cost.

Q: WHY AM I GETTING A MESSAGE ABOUT DC FAST CHARGING FROM GREENLOTS? HOW DOES GREENLOTS FIT INTO THE BC EV INFRASTRUCTURE PROJECT?

The British Columbia Electric Vehicle Infrastructure Project is led by BC Hydro and supported by the province of British Columbia, the federal government, municipalities and the private sector. As a private partner, Greenlots provides the EV network solution that manages EV charging stations and associated services, including payment service and driver support.