



June 6, 2018

Mr. Patrick Wruck  
Commission Secretary  
British Columbia Utilities Commission  
6<sup>th</sup> Floor, 900 Howe Street  
Vancouver, BC V6Z 2N3

Dear Mr. Wruck:

Please find enclosed responses from the British Columbia Ministry of Energy, Mines and Petroleum Resources to Information Requests No.1 received as part of the British Columbia Utilities Commission Inquiry into the Regulation of Electric Vehicle Charging Service (Project No.1598941) from:

- the British Columbia Utilities Commission (Exhibit A-20);
- the BC Sustainable Energy Association and Sierra Club BC (Exhibit C6-3);
- the Commercial Energy Consumers Association of BC (Exhibit C24-12);
- ChargePoint (Exhibit C25-6); and
- the Vancouver Electric Vehicle Association (exhibit C30-5).

If you have any questions regarding these responses or require any further information, please contact Shannon Craig at [Shannon.Craig@gov.bc.ca](mailto:Shannon.Craig@gov.bc.ca) or 778-698-7016.

Thank you.

Sincerely,

Les MacLaren  
Assistant Deputy Minister  
Electricity and Alternative Energy Division

Enclosures

**BC Ministry of Energy, Mines and Petroleum Resources**  
**Response to Information Request No. 1 from the British Columbia Utilities Commission**

**British Columbia Utilities Commission**  
**Inquiry into the Regulation of Electric Vehicle Charging Service**

**Project No. 1598941**

**June 6, 2018**

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**A. BASIS FOR EV CHARGING SERVICE REGULATION EXEMPTION**

**1.0 Reference:** **Exhibit C19-2, pp. 6–7**  
**Basis for regulation**

On pages 6 to 7 of Exhibit C19-2, British Columbia Ministry of Energy, Mines and Petroleum Resources (MEMPR) states:

The Commission's oversight of public utilities ensures that customers receive safe, reliable and non-discriminatory energy services at fair rates from the utilities it regulates. Aspects of EV charging services that may require regulation in order to meet those objectives include rates charged to customers, impacts on ratepayers (if charging services provided by public utilities), infrastructure safety (including installation and use), and siting. A variety of agencies other than the Commission currently have a role in regulating some of these aspects of EV charging services.

...

Some aspects of EV charging services fall outside of any current regulation, including:

- systems and networking requirements, such as open protocols, that may be necessary for data sharing and tracking; and
- maintenance or operation standards for reliability.

**1.1 Please discuss, in the view of MEMPR, whether there is a basis or potential benefit for the aspects of EV charging services that fall out of any current regulation to be regulated and by whom.**

**RESPONSE:**

**In the view of MEMPR, EV charging station users could see benefits in terms of enhanced station reliability and functionality if systems and networking requirements and maintenance and operation standards were regulated; however, no government entity currently has the mandate or expertise to develop and enforce these types of regulations. As a result, MEMPR sees two possible future outcomes:**

1. Depending on how the market develops, an association might be established with members adhering to a code of conduct and best practices, particularly with respect to systems and networking requirements.
2. There might be a role for the Commission in approving terms and conditions for the provision of EV charging services by a public utility, and terms and conditions for the provision of electricity to a non-regulated EV charging service provider. For example, in Order G-71-16, the Commission ordered Bakerview EcoDairy to operate and maintain its facilities to ensure safe, reliable and adequate service pursuant to section 38 of the *Utilities Commission Act*, even though Bakerview EcoDairy was exempted from other sections of that Act. MEMPR would be interested in the Commission's opinion on whether a class exemption for DC fast-charging service providers, conceptually similar to the exemptions granted under Order G-71-16, would provide potential benefits for these aspects of EV charging services.

**2.0 Reference: Exhibit C19-2, pp. 8, 10  
Jurisdictional comparison**

On page 8 of Exhibit C19-2, MEMPR cites examples of different regulatory models in Oregon and Nova Scotia. On page 10, MEMPR states:

The experience from other jurisdictions shows that a variety of regulatory models for EV charging services are feasible, ranging from full regulation as public utilities to no public utility commission oversight.

- 2.1 If some form of regulation is to be in place, would one reasonable option be setting a price cap on the mark-up of electricity sold?

**RESPONSE:**

**Yes, if some form of rate regulation is to be in place, one reasonable option would be setting a price cap on the mark-up of electricity sold. Another reasonable option may be to set differentiated volumetric price caps (e.g., stations with high sales volume may have a lower price cap than stations with low sales volumes).**

- 2.2 Does MEMPR have a view on whether any of the regulatory models in other jurisdictions as reviewed by MEMPR are preferred or unsuitable for BC?

**RESPONSE:**

**MEMPR does not have a view on whether another jurisdiction's regulatory model is preferred or unsuitable for BC; however, MEMPR does have views on the general regulatory principles that are preferred for BC. In the view of MEMPR, the regulatory models from other jurisdictions that allow the involvement of existing public utilities (e.g., BC Hydro and FortisBC) in the EV charging station market are preferred for BC (e.g., Ontario, California and Quebec). A regulatory model that does not allow involvement by existing public utilities in the EV charging station market is unsuitable for BC. At this current stage of EV market development, MEMPR prefers a model that allows existing public utilities**

**to kick-start the market by investing in EV infrastructure and recovering costs from all ratepayers, rather than as a non-regulated venture.**

**The associated real or perceived regulatory burden associated with the current regulatory scheme in BC may be an obstacle to investments in public EV charging infrastructure for other entities that are not otherwise public utilities. For these other entities that wish to enter the EV charging station market, MEMPR supports a regulatory model that reduces undue regulatory burden and cost of providing EV charging services in BC, so long as the interests of consumers are protected and safety considerations are adequately addressed.**

**3.0 Reference: Exhibit C19-2, pp. 7–8, 12  
Degree of competitiveness**

On page 8 of Exhibit C19-2, citing an article from the Center for Strategic and International Studies, MEMPR states:

[The article] notes that establishing a profitable business model for EV charging infrastructure is challenging because of high upfront investment costs, low and uncertain near-term demand, and competition from home charging. The article notes that some see utilities “as the way to overcome all three of these challenges: utilities can address uncertainty by being told by regulators to install infrastructure (and at a pace directed by the regulator), can address the financing challenges by seeking ratebasing for the infrastructure, and can deploy in the immediate term if directed to do so by public utility commissions. In short, the market challenges faced by third-party EV charging vendors evaporate when the utility is the one doing the installing.” Disadvantages of public utility involvement include the potential risk to ratepayers and the potential for stifled competition.

On page 7 of Exhibit C19-2, MEMPR states:

For Level 3 charging stations, there are barriers to entry, which suggests that utilities have an opportunity to play an important role in developing this market.

On page 12 of Exhibit C19-2, MEMPR states that it “supports a role for public utilities in “kick-starting” the market for EV charging services. A role for public utilities would not preclude other entities from also investing in EV charging services.”

**3.1 Does MEMPR have a position on whether utilities should be encouraged to take a lead on installing EV infrastructure as a means of scaling up significant expansion of public EV charging infrastructure in BC?**

**RESPONSE:**

**Yes, it is MEMPR’s position that utilities should be encouraged to take a lead on installing EV infrastructure as a means of scaling up significant expansion of public EV charging infrastructure in BC. The Province of British Columbia and the Government of Canada, through its Electric Vehicle and**

**Alternative Fuel Infrastructure Deployment Initiative, have partnered with public utilities to install EV charging infrastructure in BC.**

- 3.1.1 Does MEMPR have a position on whether utility involvement in the EV charging service market should change as the market matures?

**RESPONSE:**

**No, MEMPR does not currently have a position on whether utility involvement in the EV charging service market should change as the market matures, because MEMPR can't predict exactly how the EV charging station market will mature and whether/how the economics of EV charging station ownership will change with increased EV adoption rates and advancements in EV and charging station technology.**

- 3.1.1.1 If so, please explain and provide any key indicators that MEMPR considers would demonstrate market maturity. For example, should this be the number of EVs fleet in BC, number of EV charging stations/ports per EV, distance measured between public EV charging stations, or some other measures?

**RESPONSE:**

**In MEMPR's opinion, the size of the BC EV fleet is the primary indicator that could be used to evaluate EV charging service market maturity; however, MEMPR can't say at this time what size of EV fleet would demonstrate market maturity. As noted above under the response to question 3.1.1, MEMPR can't predict exactly how the EV charging station market will mature.**

- 3.1.2 Is MEMPR aware of any jurisdiction where unregulated providers and/or third-party private investors are leading the EV charging market? Please discuss the stage of growth of the EV market in such jurisdiction, the policy environment, and the regulatory environment.

**RESPONSE:**

**If the Commission is using the term "leading" to mean that unregulated providers or third-party private investors own the majority of DC fast-chargers and are covering the full cost of DC fast-charger installation, ownership and operation, then no, MEMPR is not aware of any jurisdiction where unregulated providers and/or third-party private investors are leading the DC fast-charging market. In Ontario's unregulated market, private investors do own and operate the majority of DCFCs, but they utilize provincial and federal funds to assist with capital costs of construction. MEMPR's overall conclusion from its research is that installation of DC fast-charging stations in most jurisdictions is driven by government (via funding programs), with public utilities also playing a key role. In addition, car manufacturers, including Tesla, also play a significant role in some jurisdictions. For example, as part of its diesel emissions settlement with the U.S. government, Volkswagen Group of America has pledged to spend \$2 billion on electric vehicle infrastructure and education.**

- 3.1.3 In MEMPR's view, under what market conditions would third party private investment be more appropriate than public utility investments in the EV charging service market?

**RESPONSE:**

**At this time, MEMPR's view is that both third-party private investments and public utility investments are appropriate in the EV charging service market. As noted above under the response to question 3.1.1, MEMPR can't predict exactly how the charging station market will mature (e.g., to what extent ancillary services will be provided at charging station locations) or describe the market conditions that would make third-party private investment more appropriate.**

- 3.2 Under what conditions would increase third-party DCFC infrastructure investments and less reliance on public utility involvement? Please explain.

**RESPONSE:**

**In MEMPR's view, third-party DC fast-charging infrastructure investments will increase once EV adoption rates increase and infrastructure costs are reduced, resulting in a positive business case for DC fast-charging stations. The current regulatory scheme and utility demand charges may also be barriers to third-party DCFC infrastructure investment.**

- 3.3 In a competitive market, there are low barriers to enter and exit. Please discuss the potential issues, if any, should EV charging service providers freely exit the market at any time.

**RESPONSE:**

**Service providers exiting from the EV charging station market may result in stranded assets, if the charging stations are not designed with open protocol software that would allow use by another service provider.**

**4.0 Reference: Exhibit C19-2, p. 10, 12  
Basis for regulation**

On page 10 of Exhibit C19-2, MEMPR states:

There may be benefits to some form of Commission regulation of Level 3 charging services. A complaint-based form of regulation may be sufficient to address concerns regarding fairness of rates.

- 4.1 Please briefly expand upon the potential benefits of regulation of Level 3 charging stations.

**RESPONSE:**

**Depending upon the form of regulation, potential benefits of regulation of Level 3 charging stations could include:**

- **price certainty for consumers and no “price-gouging;”**
- **enhanced station reliability through established level of service standards (see also the response to question 1.1); and/or**
- **independent consideration and resolution of complaints.**

4.2 Please confirm whether MEMPR considers a potential complaint based form of regulation to be only applicable to site hosts / third-parties, or to any entity providing EV charging services.

**RESPONSE:**

**A potential complaint based form of regulation would be applicable to any entity providing EV charging services, while recognizing that public utilities providing EV charging services (such as BC Hydro and FortisBC) are already subject to Commission regulation.**

4.2.1 Please elaborate on how MEMPR considers that a complaint based form of regulation could address the “fairness” of rates, in an environment where the rate-setting process is not subject to regulatory review and approval under the UCA.

**RESPONSE:**

**As noted above under the response to question 2.1, a price cap on the mark-up of electricity sold may be a reasonable option for rate regulation that would lend itself to a complaint based form of regulation.**

On page 12 of Exhibit C19-2, MEMPR states:

The Province has allowed public utilities to play a similar role in establishing a domestic market for natural gas in transportation through the Greenhouse Gas Reduction (Clean Energy) Regulation (GGRR) under the Clean Energy Act. The GGRR allows utilities to implement prescribed undertakings for a specified time period without seeking the prior approval of the Commission for programs that lead to GHG reductions, although the Commission still has the ability to rule on the prudence of expenditures. A similar mechanism could be used for DC fast-chargers. The Province could consider establishing objectives through legislation that would guide determinations of whether or not particular EV charging infrastructure investments could be recovered from ratepayers.

4.3 Please confirm, or explain otherwise, that this potential mechanism to have particular EV charging infrastructure investment to be recovered from ratepayers would involve an amendment to the regulations.

**RESPONSE:**

Yes, implementation of the potential mechanism suggested by MEMPR in the excerpt quoted above would require an amendment to the Greenhouse Gas Reduction (Clean Energy) Regulation (GGRR) under the *Clean Energy Act*. MEMPR would be interested in advice from the Commission regarding the language of such an amendment. Another option to achieve a similar end result would be for the Commission to provide guidance to public utilities on the criteria under which investments in EV charging infrastructure could be recovered from all ratepayers, similar to the criteria endorsed by the Public Utility Commission of Oregon (see footnote 9 of MEMPR's submission).

**5.0 Reference: Exhibit C19-2, p. 12  
Investment / BCUC's role in EV mass adoption**

On page 12 of Exhibit C19-2, MEMPR states:

MEMPR would be interested in advice from the Commission regarding appropriate levels of investment that public utilities should consider in developing EV charging infrastructure. MEMPR's modeling shows that at least 200 new DC fast-chargers are required to provide adequate coverage throughout BC. There may also be a need for more DC fast-chargers in metropolitan areas. To manage impacts on ratepayers, some type of formula or other criteria could be used to guide utility investments (e.g., a maximum number of stations installed per year, metrics to assist in identifying areas and locations that utilize the existing transmission and distribution system or provide that maximum net benefit, a specific revenue-to-cost ratio, or some other metric).

- 5.1 Please briefly describe the assumptions underpinning the modeling for the minimum 200 new DC fast-chargers. If possible, please share this model with the BCUC.**

**RESPONSE:**

The model used is a proprietary modeling tool developed by Kelly Carmichael of BCIT. The EV Planning Infrastructure Assistant tool takes into account factors that could impact EV range, such as:

- Efficiency of the vehicle;
- Weight of the vehicle and contents (passengers);
- The terrain the vehicle is travelling on (particularly elevation gain and loss);
- Speed limits of the roads; and
- Outside air temperature.

The modelling work done was based on the following parameters:

- 30kWh vehicle;
- 3 year old vehicle;
- 2 individuals in vehicle;
- Temperature of -10°C for Vancouver Island and Lower Mainland and -20°C for the rest of BC; and
- Vehicle fully charged at each charging stop.

- 5.1.1 Please confirm by when 200 new DC fast-chargers are required, and clarify whether this refers to the number of stations or charging ports.

**RESPONSE:**

**The figure of 200 cited on page 12 of MEMPR's submission refers to charging station locations (not ports). There is no particular date or EV adoption metric associated with the requirement for 200 new DC fast-chargers; they are required now in order to provide adequate coverage (in terms of distance between stations) for existing EV owners travelling throughout BC.**

- 5.2 Please confirm whether the figure of 200 new DC fast-chargers includes stations or ports in metropolitan areas.

**RESPONSE:**

**The figure of 200 new DC fast-chargers includes very few charging stations in metropolitan areas, as the modeling was undertaken with a view to establishing a network that provided adequate coverage (in terms of distance between stations) for EV owners travelling throughout the province. MEMPR anticipates that, as the market grows, there will be a need for multiple ports at charging stations and/or clusters of charging stations in metropolitan areas to avoid queuing for charging.**

- 5.2.1 If not confirmed, please summarize any modeling that MEMPR has undertaken with regards to metropolitan areas.

**RESPONSE:**

**MEMPR has not undertaken any specific modeling for metropolitan areas. See also the response to question 5.2.**

- 5.2.2 Please discuss whether MEMPR has a view on whether public utilities in providing DC fast-chargers should be different for increasing the density of charging options in metropolitan areas versus provision of wider coverage throughout BC.

**RESPONSE:**

**In the short term, MEMPR does not support a distinction in the role that public utilities may play in increasing the density of charging options in metropolitan areas versus providing wider coverage throughout BC. MEMPR sees that public utilities have a role in both. Similarly, MEMPR has previously noted its support for access to energy services on a postage stamp rate basis so that all British Columbians benefit from access to services at the lowest average cost.<sup>1</sup>**

**If the business case for DC fast-charging stations in metropolitan areas improves, such a distinction could be considered. MEMPR notes that the Public Utilities Commission of the State of California has**

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<sup>1</sup> See the submission made by the Ministry of Energy and Mines in the reconsideration of the Commission's decision related to FortisBC Energy Utilities' Common Rates, Amalgamation and Rate Design Application: [http://www.bcuc.com/Documents/Proceedings/2013/DOC\\_35100\\_C3-1\\_MEM\\_IntervenerReg.pdf](http://www.bcuc.com/Documents/Proceedings/2013/DOC_35100_C3-1_MEM_IntervenerReg.pdf)

**approved EV charging investment programs by public utilities that focus on sites that may otherwise be under-served by EV charging infrastructure, including disadvantaged communities, condominiums, apartment buildings and workplaces.<sup>2</sup>**

- 5.3 Please discuss whether MEMPR has a position on whether the Ministry, BCUC or other entity, should ultimately be the entity responsible for determining the appropriate level of investment by public utilities.

**RESPONSE:**

**MEMPR's position is that, once the EV charging station market matures, the Commission should determine the appropriate level of investment by public utilities in DC fast-charging stations. In the interim, in order to kick-start the DC fast-charging station market, some combination of government and Commission oversight may be appropriate.**

**MEMPR is interested in any advice from the Commission regarding the most appropriate way that government can kick-start this market. The Province of BC has passed legislation to update the Province's greenhouse gas reduction targets, setting a new legislated target of a 40% reduction in carbon emissions from 2007 levels by 2030. Multiple measures will be required in order to meet this target. Measures to achieve significant reductions in greenhouse gas emissions in the transportation sector will be required, including measures to electrify the transportation sector.**

**B. INVESTMENT DECISION**

- 6.0 Reference: Exhibit C19-2, p. 4  
Investment – DCFC**

On page 4 of Exhibit C19-2, MEMPR states:

a second phase of DC fast-charging station deployment was supported by the Province, with partial funding for 21 new stations across BC. Most recently, in the Budget Update of September 2017, further Provincial investment in DC fast-chargers was confirmed, with \$2 million going into a multi-year joint call with Natural Resources Canada for a targeted additional 80 DC fast-charging stations in BC.

- 6.1 For forthcoming Provincial DCFC funding initiatives, please confirm the process for selecting partner organizations to own and operate the DCFC stations.

**RESPONSE:**

**The Province's funds for supporting upcoming DCFC deployments are being managed directly by Natural Resources Canada (NRCan) in order to leverage 2:1 federal dollars. NRCan's process involves a call for proposals and evaluation of submitted proposals, based primarily on the shared federal and provincial government objective of creating reliable, efficient travel along primary corridors. NRCan's overarching mandate is to facilitate coast-to-coast EV travel in Canada.**

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<sup>2</sup> See, for example: [https://www.pge.com/tariffs/tm2/pdf/ELEC\\_5020-E.pdf](https://www.pge.com/tariffs/tm2/pdf/ELEC_5020-E.pdf)

**7.0 Reference:** **Exhibit C20-2, p. 6**  
**Exhibit C15-2, p. 2**  
**DCFC - third-party investment**

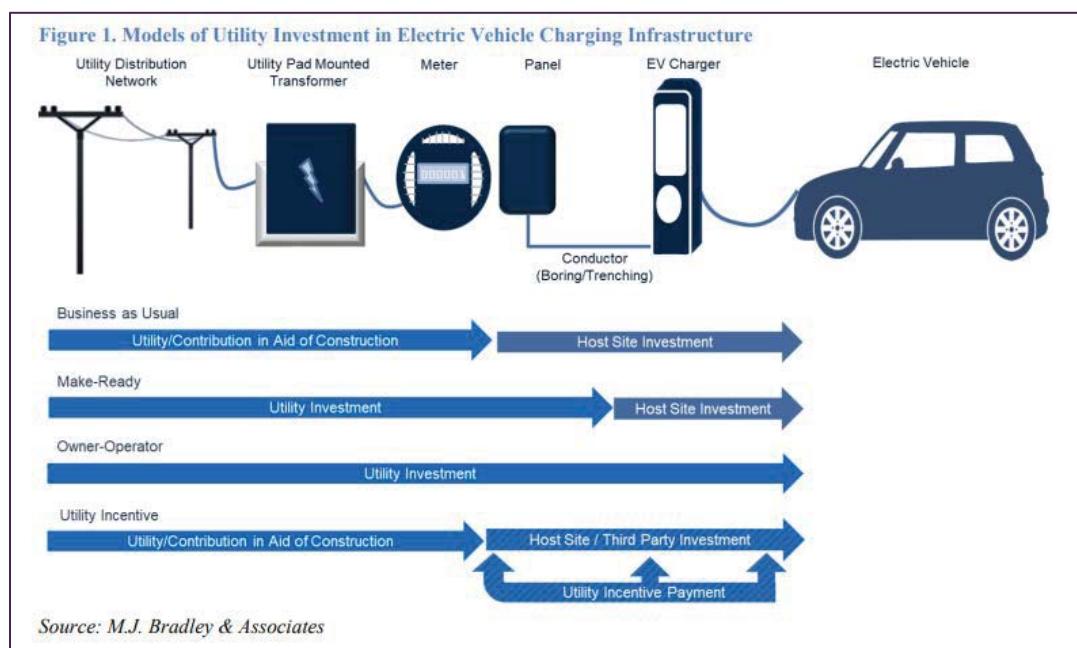
On page 6 of Exhibit C20-2, AddÉnergie Technologies Inc. states:

That the major barrier to EV charging station competitiveness is that British Columbia lacks a comprehensive network of charging stations and that one is unlikely to be developed by [third-party] investment alone.

On page 2 of Exhibit C15-2, Greenlots states:

[Unfortunately] a sustainable, competitive market is aspirational, and is unlikely to arise prior to the adoption of a critical mass of electric vehicles. This is primarily on account of a lack of a business model for the ownership and operation of public charging stations based on sustainable revenues from charging activities, and this has thus far resulted in a fundamentally inadequate amount of [third-party] investment in such charging infrastructure.

In a report authored Georgetown Climate Center and by M.J. Bradley & Associates, titled “Utility Investment in the Electric Vehicle Charging Grid: Key Regulatory Considerations” dated November 2017<sup>3</sup> (GCC-MJBA Report), on page 9, Figure 1 provides the models of utility investment in EV charging infrastructure: (i) business as usual, (ii) make-ready, (iii) owner-operator, and (iv) utility incentive.



<sup>3</sup> [http://www.georgetownclimate.org/files/report/GCC-MJBA\\_Utility-Investment-in-EV-Charging-Infrastructure.pdf](http://www.georgetownclimate.org/files/report/GCC-MJBA_Utility-Investment-in-EV-Charging-Infrastructure.pdf)

- 7.1 Please discuss the pros and cons of the four business models that are noted in the GCC-MJBA Report.

**RESPONSE:**

The following excerpt from page 8 of MEMPR's submission outlines some of the pros and cons associated with the business as usual and owner-operator models of investment noted in the GCC-MJBA Report:

"There are a number of advantages and disadvantages associated with public utility involvement in EV charging services. An April 2016 article from the Center for Strategic and International Studies<sup>4</sup> notes that establishing a profitable business model for EV charging infrastructure is challenging because of high upfront investment costs, low and uncertain near-term demand, and competition from home charging. The article notes that some see utilities "as the way to overcome all three of these challenges: utilities can address uncertainty by being told by regulators to install infrastructure (and at a pace directed by the regulator), can address the financing challenges by seeking ratebasing for the infrastructure, and can deploy in the immediate term if directed to do so by public utility commissions. In short, the market challenges faced by third-party EV charging vendors evaporate when the utility is the one doing the installing." Disadvantages of public utility involvement include the potential risk to ratepayers and the potential for stifled competition."

The pros and cons of the make-ready and utility incentive models noted in the GCC-MJBA Report would be similar to those for the business as usual model.

- 7.1.1 In MEMPR's view, which business model(s) would be most appropriate currently for the mass adoption of EVs?

**RESPONSE:**

Based on the experience to date in BC and the experience in other jurisdictions that have allowed public utility involvement in the provision of EV charging services, MEMPR supports a role for public utilities in "kick-starting" the market for EV charging services through the owner-operator model noted in the GCC-MJBA Report. A role for public utilities would not preclude other entities from also investing in EV charging services under the business as usual model.

MEMPR could envision a role for utility "incentives" as contemplated under the make-ready and utility incentive models noted in the GCC-MJBA Report. While MEMPR already funds the Charging Incentives and Solutions Program administered by Plug In BC<sup>5</sup>, in the future BC utilities could provide incentives towards the cost of the purchase and installation of eligible EV charging equipment and support services for multi-unit residential buildings and workplaces seeking solutions for their EV charging needs, thus relieving the Province of funding such programs.

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<sup>4</sup> <https://www.csis.org/analysis/utility-involvement-electric-vehicle-charging-infrastructure-california-vanguard>

<sup>5</sup> For further information, see <https://pluginbc.ca/charging-program/charging-solutions-incentives/>

- 7.1.2 Which business models(s) would be most appropriate as the EV market matures in the future?

**RESPONSE:**

**See responses to questions 3.1.1 and 3.1.3.**

**C. HYDROGEN FUEL CELL TECHNOLOGY**

- 8.0 Reference: Exhibit C19-2, p. 2  
Fuel Cell Electric Vehicle (FCEV)**

On page 2 of Exhibit C19-2, MEMPR states that “The Province is active in promoting the uptake of zero emission vehicles (ZEVs), including battery-electric, plug-in hybrid, and fuel cell vehicles.”

In a news release dated March 27, 2017,<sup>6</sup> the Government of BC noted its Clean Energy Vehicle (CEV) Program, which in February 2016 it announced an investment of \$40 million for the CEV Program over three years (2017-18, 2018-19, 2019-20), including the expansion of public, residential, and workplace charging and hydrogen fuelling infrastructure.

There is currently one public hydrogen fueling station operating at Powertech Labs in Surrey, BC.<sup>7</sup>

- 8.1 To the best of MEMPR’s knowledge, please provide an estimated number of FCEVs relative to ZEVs registered in BC. Please provide the breakdown the information by vehicle type (e.g., private passenger vehicles), if possible.

**RESPONSE:**

**Currently there are approximately 10,000 ZEVs registered in BC, including twelve light duty hydrogen fuel cell vehicles.**

- 8.2 In MEMPR’s view, from a charging infrastructure perspective, please compare and contrast the pros and cons of FCEVs relative to battery electric and plug-in hybrid electric vehicles.

**RESPONSE:**

**All types of battery electric vehicles allow for some level of home charging, which is not an option for hydrogen fuelling. With regards to public stations, hydrogen fuelling stations are far more expensive to build in comparison to DCFCs. However, the hydrogen refuelling time is up to ten times faster for FCEVs, compared to fast-charging for BEVs and PHEVs, and FCEVs offer substantially greater range than most BEVs at this time.**

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<sup>6</sup> Exhibit C12-2, Appendix 3, FACTSHEET: Clean Energy Vehicle Program/Innovative Clean Energy Fund, dated March 27, 2017.

<sup>7</sup> <https://www2.gov.bc.ca/gov/content/industry/electricity-alternative-energy/transportation-energies/clean-transportation-policies-programs/clean-energy-vehicle-program/hydrogen-fuelling>

**In MEMPR's view, both technologies will have key roles to play in the decarbonization of transportation systems, serving different use case scenarios.**

- 8.3 In MEMPR's view, from a user perspective, please compare the pros and cons of FCEVs relative to battery electric and plug-in hybrid electric vehicles.

**RESPONSE:**

**As stated in the response to question 8.2, shorter refuelling time and longer range, along with power needed for medium and heavy duty transportation applications, are the advantages of FCEVs. For BEVs and PHEVs, home charging and relatively inexpensive fuel costs are current advantages compared to FCEVs.**

- 8.4 The Hydrogen Fueling Infrastructure Program indicates that a second public hydrogen fueling station is expected to be completed by 2018. If possible, please briefly discuss the status of the second public hydrogen fueling station.

**RESPONSE:**

**The hydrogen fuelling station operating at Powertech Labs in Surrey is not accessible for use by the general public and therefore cannot properly be considered as a “public” fuelling station. Although question 8.4 asks about the status of the “second” public hydrogen fuelling station in BC, this new station, scheduled to come into service in June 2018, will actually be the first truly “public” hydrogen fuelling station in BC, as it will be accessible to the general public. Further details regarding the station opening will be forthcoming as part of a public announcement.**

**Following the opening of this public hydrogen fuelling station in June 2018, two additional stations will be opened in British Columbia this year, the first in the Lower Mainland and the second in the Capital Regional District. This will bring the total number of public hydrogen fuelling stations to three, by the end of 2018.**