



LAW DEPARTMENT

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June 6, 2018

BY EMAIL: Commission.secretary@bcuc.com

British Columbia Utilities Commission
Suite 410 - 900 Howe Street
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Attention: Commission Secretary - Mr. Patrick Wruck

RE: BCUC Inquiry into the Regulation of Electric Vehicle Charging Service - Information
Request No. 1 from BCUC

Dear Commission Secretary,

Please find enclosed the City of Vancouver's responses to the Information Request No. 1 from BCUC.

Sincerely,

A handwritten signature in blue ink that reads "Hannah Joossen".

for: David K.S. Li

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**CITY OF VANCOUVER'S RESPONSES DATED JUNE 6, 2018 TO THE INFORMATION REQUEST NO. 1
FROM THE BRITISH COLUMBIA UTILITIES COMMISSION DATED MAY 3, 2018**

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

INFORMATION REQUEST NO. 1 TO CITY OF VANCOUVER

A. BASIS FOR EV CHARGING SERVICE REGULATION EXEMPTION

**1.0 Reference: Exhibit C5-2, pp. 12-13
Regulatory oversight of EV charging service**

On page 12 of Exhibit C5-2, City of Vancouver (Cov) also states:

In general, the Commission should forbear from regulating the service providers to the extent the market conditions allow, but remain available to resolve disputes on a complaint basis.

1.1 Please discuss how the BCUC can remain active to resolve complaints when it forebears from regulation?

COV Response to IR 1.1: *The full passage in which the quoted statement appears is as follows:*

In general, the Commission should forbear from regulating the service providers to the extent the market conditions allow, but remain available to resolve disputes on a complaint basis. The Commission should adjust its approach to regulation based on the different categories of EV charging service, based on the extent to which the EV owner or user has access to competitive alternatives. (pages 12-13 of the COV submission Exhibit C5-2)

COV suggests that the Commission should forbear from regulating the service providers to the extent the market conditions allow. In other words, the Commission should retain jurisdiction to regulate the rates and terms of service for EV charging service where the market is not competitive, but adopt a complaint-based approach. The Commission would forbear from regulating unless it receives a complaint, or there is a market failure.

This approach would be consistent the Commission's description of its approach to regulation set out on the AES Inquiry decision.

- a. Only regulate when required.*
- b. Regulation should not impede competitive markets.¹*

¹ BCUC Report, *FortisBC Energy Inc. - Inquiry into the Offering of Products and Services in Alternative Energy Solutions and Other New Initiatives*, December 2012, pages 6-7.

Later in the decision, the Commission elaborated further:

Regulation exists to protect consumers against the abuse of monopoly power but, in the Commission Panel's view, the superior protection for consumers is the competitive marketplace. ... This is consistent with the first principle outlined in this Section, to only regulate where required. Competitive forces are generally accepted as providing societal benefits and consumer protection more efficiently and effectively than economic regulation.

Regulation is costly, time-consuming, and limited by informational asymmetries. It is only in natural monopoly situations where consumer protection is needed that these limitations are outweighed by the benefits of regulation.

Based on the above, the Commission Panel finds as a fundamental principle that regulation is only appropriate where required and is driven by the inability of competitive forces to operate with greater efficiency and effectiveness than a sole service provider.²

The Commission should establish its approach to regulation based on

1. the different categories of EV charging service, and
2. the extent to which the EV owner has access to competitive alternatives.

The Commission established a differentiated approach to regulation for the AES market³, that overall follows a complaint-based approach but allows for a lighter regulatory touch where appropriate. The Commission should adopt a similar approach for the regulation of the EV charging service market, which would allow the market to operate where competitive conditions exist.

1.1.1 Who should pay for the BCUC costs to resolve complaints?

COV Response to IR 1.1. The City would like to see a structure that avoids discouraging EV service providers from investing in EV charging infrastructure, while at the same time does not discourage users of that infrastructure from pursuing reasonable complaints.

If a complaint is successful, then the Commission should recover the cost to review the complaint from the regulated EV service.

If a complaint is unsuccessful but had a reasonable basis, then the Commission should consider a cost-sharing structure between the regulated EV service and the complainant or consider setting aside, or asking the Province for, funds for this purpose. Complaints, especially in the early years of policy development, can provide guidance to policy makers and therefore should be enabled in a reasonable and rational way.

If a complaint is unsuccessful and has no merit, then the Commission should recover the

² *Ibid*, page 14.

³ British Columbia Utilities Commission, *Thermal Energy Systems – Regulatory Framework Guidelines*, (2015), Order G-27-15, (“TES Guidelines”)

cost from the complainant.

Notwithstanding the above suggestions, the City is concerned that any requirement for a complainant to pay for BCUC's costs may discourage complainants from coming forward at all. It is worth noting that the complainants in an EV charging context will likely be members of the public who do not have the same financial means as the operators of the equipment.

Many complaints at the early stage of market development will serve as useful guidance to industry and policymakers. A complaint structure that does not discourage legitimate complaints nor investment in EV charging equipment, and also motivates complainants and EV charging operators to behave reasonably and rationally would be preferred.

The Province and/or the BCUC should use the outcomes from any complaints to update guidance to minimize the need for future dispute resolutions where possible.

On page 12 of Exhibit C5-2, CoV states:

The safety of EV charging stations must be regulated. This regulatory oversight is critical from the perspective of avoiding personal injuries or death and/or property damage. Similarly, a safety incident at an EV charging station will rightly raise concerns about the technology and hinder the adoption of EVs.

Further on page 13, CoV states:

The City also believes that the Commission or Province should offer guidance, and potentially regulation, on the reliability of EV charging stations so users of the infrastructure, and potential future users, have confidence in its ability to provide the level of service people have come to expect with gasoline and diesel fueling.

In accordance with the *Utilities Commission Act (UCA)*, the BCUC does not regulate municipality or regional district in respect of services provided by the municipality or regional district within its own boundaries.

- 1.2 Please discuss the safety oversight for EV charging stations that are owned or operated by the CoV.

COV Response to IR 1.2: The CoV's Electrical By-law No. 5563 applies to the EV charging stations that are owned or operated by the CoV. This By-law incorporates the Canadian Electrical Code, Part 1, 23rd Edition, Safety Standard for Electrical Installations. The Province's Safety Standards Act also applies to EV charging stations installed in the City of Vancouver.

- 1.3 Please discuss the installation, operations, and maintenance requirements of public EV charging stations. For instance, are there any requirements established for which installations, operations, and maintenance of public EV charging stations must be handled by trained and certified electricians? Are there any permit/inspection process?

COV Response to IR 1.3: The CoV's Electrical By-law No. 5563 applies to the installation, operation and maintenance of electrical equipment in the City of Vancouver – including EV charging stations. This By-law incorporates the Canadian Electrical Code, Part 1, 23rd Edition, Safety Standard for Electrical Installations. The Province's Safety Standards Act also applies.

Under this regulatory framework, a permit is required in order to install, operate or maintain electrical equipment, the City Electrician has certain inspection rights in respect of electrical equipment, and there are training and certification requirements in respect of electricians. A “public utility” under the Utilities Commission Act is exempt from certain parts of this regulatory framework.

- 1.4 Please discuss whether there are any existing minimum requirements of the owner and/or operator of public EV charging stations to purchase liability insurance, or other insurance, to cover against potential losses.

COV Response to IR 1.4: Public EV charging stations that are owned or operated by the CoV are covered by the CoV’s liability and other insurance policies. Operators of public charging stations that are enabled by the CoV (for example, under the CoV’s Curbside EV Charging Pilot Program) are required to carry a minimum amount of liability insurance and, if deemed necessary by the CoV, property insurance. In respect of other public EV charging stations that are not operated by the CoV or enabled by the CoV pursuant to a CoV program, the CoV is not aware of any existing minimum requirements for liability or other insurance to be purchased by the owner or operator.

- 1.5 Please briefly discuss the regulatory oversight of safety for home EV charging stations that are downstream of the utility’s electricity meter.

COV Response to IR 1.5: The CoV’s Electrical By-law No. 5563 applies to the installation, operation and maintenance of electrical equipment in the City of Vancouver – including EV charging stations owned or operated by home owners for personal use. This By-law incorporates the Canadian Electrical Code, Part 1, 23rd Edition, Safety Standard for Electrical Installations. The Province’s Safety Standards Act also applies.

- 1.6 Please clarify how/why property damage should be regulated by the BCUC. Why shouldn’t property damage be the responsibility of the site host? Please discuss.

COV Response to IR 1.6: Public confidence in EV charging equipment is important to encouraging higher rates of EV adoption. If an EV charging equipment user knows that he or she will be compensated if he /she gets hurt, or if his/her property is damaged, from using the EV charging equipment, he/she will be more comfortable using it. To achieve this level of protection for the user and confidence in the charging services wherever the user may use EV charging services in British Columbia, it may be necessary to standardize the requirement for liability insurance – at least during the early days of the EV charging industry. A Provincial body such as BCUC or ICBC would be in the best position to set such standards across the Province.

- 1.7 In CoV’s view, what are the indicators for “reliability” of an EV charging station?

COV Response to IR 1.7: Most EV drivers will also have driven conventional gasoline vehicles and are accustomed to the convenience and reliability of refueling at a gas station. Accordingly, EV charging stations (1) should be as readily accessible as gas stations, (2) should be easy to use and trouble-free, and (3) be available with minimal wait time.

- 1.8 If EV charging service is regulated, please discuss CoV’s views on what would be BCUC’s role as a regulator in relation to (i) safety and (ii) reliability?

COV Response to IR 1.8: *In CoV's view, safety and reliability are related. In respect of a particular technology such as EV charging stations, it is necessary to have both to make users comfortable and confident about using the technology. Having one, without the other, is unlikely to result in use that is consistent with the Province's energy and climate change objectives.*

In respect of safety, CoV believes a provincial body may be required to establish a consistent safety standard throughout the Province. Currently, there may be differences in safety standards among different municipalities, as well as differences between EV charging stations installed within a municipality versus stations installed outside of a municipality. The charging station technology is also relatively new and continues to evolve. Public utilities as defined under the Utilities Commission Act are also exempt from the Electrical Safety Regulation under the Province's Safety Standards Act. For these reasons, a provincial body is the most suitable to establish a consistent safety standard. It will be up to the Province to decide whether the BCUC, or some other provincial body, is most appropriate.

In respect of reliability, in order to achieve the level of reliability described in our response to IR 1.7, the rate that EV charging station operators are able to charge, and the business model such operators are able to employ in providing such a service, will be relevant. The rate and business model will directly influence factors such as the demand for charging stations, the willingness of charging station suppliers, owners and operators to invest in more stations and to make them more accessible, how well-maintained charging stations will be and how quickly station technology will evolve and improve. As such, our perspectives favour as little regulation as possible for pricing and business models to give potential investors maximum flexibility in finding business models to provide reliable EV charging service.

With respect to other elements of reliability noted in our response to IR 1.7, the CoV believes that efforts to ensure the EV charging network is readily accessible with minimal wait times is best handled through guidance from the provincial government.

B. INVESTMENT DECISION

2.0 Reference: Exhibit C20-1, p. 6; Exhibit C15-2, p. 2 Direct current fast charging - third-party investment

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

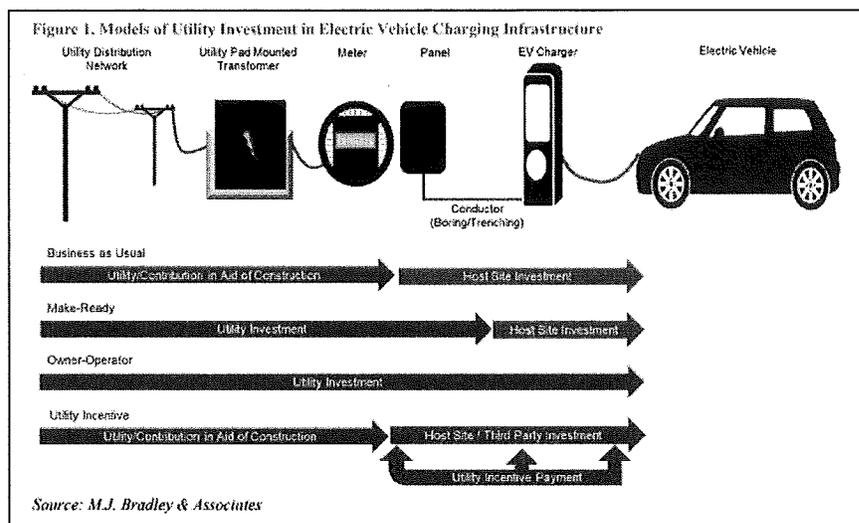
That the major barrier to EV charging station competitiveness is that British Columbia lacks a comprehensive network of charging stations and that one is unlikely to be developed by [third-party] investment alone.

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 (GCC-MJBA Report)⁴, 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.



2.1 Please discuss the pros and cons of the four business models that are noted in the GCC-MJBA Report. Include considerations such as market growth, business sustainability, customer impacts, public interest, competition, and appropriate level of utility regulation.

COV Response to IR 2.1: The City sees the MJ Bradley report that the Commission cites as a good foundation for discussing different options for the regulation of utilities with respect to electric vehicle charging infrastructure in British Columbia.

The City notes that Business as Usual (“BAU”) is illustrated in Fig. 1 of the MJ Bradley report, but is not discussed in detail. The version depicted in the in the report is not consistent with the City’s experience of EVSE deployment working with BC Hydro. For example, BC Hydro may require a site host to invest upstream of the meter for utility extensions, and generally requires the site host to invest in metering equipment. The version of BAU shown in the report has similar pros/cons to Make-ready.

The City does not consider the models in the MJB report as being mutually exclusive, and would prefer a mix of models be enabled within British Columbia. The City’s view is that elements of the ‘Make Ready’, ‘Utility Incentive’ and ‘Owner Operator’ could function well together in the near term. With a consistent approach to making the necessary EV-ready investments and providing incentives for site-hosts, utilities could play an important role in accelerating private investment in EV charging infrastructure in a way that meets safety and reliability expectations, while also encouraging competition. Further, continuing a role for the ‘Owner Operator’ model would allow utilities to continue deploying new infrastructure in the near-term as other private models begin to emerge in response to new opportunities.

In the near term, the City would not like to see ‘Owner Operator’ excluded as an option within BC. Much of the initial EV charging infrastructure in the province (particularly for DCFC) has been led by BC Hydro and FortisBC. The City would be concerned about the ability to continue

⁴ http://www.georgetownclimate.org/files/report/GCC-MJBA_Utility-Investment-in-EV-Charging-Infrastructure.pdf

accelerating deployment across the province if those utilities were excluded from the market. With significant growth anticipated in the number of EV models available in the coming years, a slowdown in charging investment would negatively impact EV uptake at a critical time.

In the medium to long-term, the need for the 'Owner Operator' model could decline as the demand for charging infrastructure and the incentives for providing it become more clearly established. Depending on how the market evolves, the declining 'owner operator' role could happen on a province-wide basis or in specific areas where a competitive market is well-established.

The City provides a discussion of the pros and cons of each model below. In many cases, the 'pros' rely on good regulatory design to be realized, and the 'cons' can be mitigated through good regulatory design.

Model	Pros	Cons	Appropriate Level of Utility Regulation
Make Ready	<ol style="list-style-type: none"> 1. Relies on traditional utility provision of service for upgrades to distribution system. Utility connection can often be the rate-limiting step and greatest cost barrier in EVSE deployment, so the acceleration of this process referenced in the report would support more rapid deployments, and likely reduce attrition. 2. Allows site hosts to make business decisions on technology choices, operational decisions, and fee structures. 3. Site host has a vested interest in reliability of station and a more direct relationship with the site, allowing for shorter maintenance response times. 4. Eliminates many of the high capital cost aspects of EVSE deployment for site hosts. 5. Allows utilities to benefit from electricity sales while not having to repay investments in EVSE. 6. Competition between site hosts will reduce consumer prices, incentivize reliability considerations in technology choices. 	<ol style="list-style-type: none"> 1. May result in a greater patchwork of technology choices, increasing challenges of interoperability and reliability. 2. Deployment of technology will be less active in areas not seen as profitable, such as low income neighbourhoods or areas with low commercial activity (i.e. complementary amenities). 3. In areas with little competition, public interest may be harmed by high pricing. 	<p>Utilities should be regulated to provide the make-ready component on an accelerated basis.</p> <p>Site Host component should be exempted from limitations on electricity sales with possible exceptions for regions deemed to be inadequately competitive. Without this exemption, non-utility investment and customer experience are likely to be diminished.</p> <p>Reliability and interoperability should be regulated on a province-wide basis.</p> <p>Would require that current BCUC regulatory prohibitions on electricity sale be removed in order to facilitate private site host involvement in this model.</p>
Utility Incentive	<ol style="list-style-type: none"> 1. Reduces financial barriers to prospective site hosts. 2. Allows utility finances to be amplified through third-party investments. 3. Potential for more installations in lower-utilization locations (e.g. – remote, low-income, etc.) because incentives can be structured to favor prioritized locations. 4. Utility continues to increase revenue 	<ol style="list-style-type: none"> 1. Site hosts may lack sophistication in best use of utility payments, leaving a potential for risk to ratepayers. 2. May result in a greater patchwork of technology choices, increasing challenges of interoperability and reliability. 3. Requires structuring to ensure a balance between best use of utility funds without undue utility influence in site host’s market activities. 	<p>Utilities should be regulated insofar as ensuring that construction supports are provided in a timely manner that prevents programs from falling into disrepute.</p> <p>Recipients of utility incentive financing should be registered and subject to review by the Commission on a complaints basis.</p>

	<p>through additional electricity sales.</p> <p>5. Competition between site hosts will reduce consumer prices, incentivize reliability considerations in technology choices.</p>		<p>Utility incentives should avoid limiting business model innovation from site hosts such as fee models.</p> <p>Reliability and interoperability should be regulated on a province-wide basis.</p>
Owner-Operator	<ol style="list-style-type: none"> 1. Continuity in utility operations, clear accountabilities for reliability of EV infrastructure 2. Leverages significant utility capital 3. Allows utilities to plan for service upgrades 4. Can be structured to ensure investment in EV charging infrastructure in areas where a clear business case for the private sector is absent, supporting the broader public interest in a robust charging network. 	<ol style="list-style-type: none"> 1. Utilities such as BC Hydro rarely have their own sites to install infrastructure, requiring continued reliance on site hosts with unclear incentives for site hosts to install. Utilities may have to pay license / lease costs to install at host sites. 2. Utility goals for installation, utilization, pricing, etc. may not align with goals of site hosts and/or host municipality. 3. Utilities' incentive to respond to station problems may be limited with low competition. 4. Utility may be required to consider additional cost of EVSE (both operating and capital) in business case, which could significantly limit investment. 5. In current regulatory context, competition is not possible since few other market entrants are possible; in the case where EV infrastructure is exempted from BCUC restrictions on electricity sale, competition could be harmed if utilities are able to leverage their significant capital in ways that aren't available to other site hosts. 6. If the market is reliant on the 'owner operator' model, there is an increased risk that public charging network will be reliant on a single technology provider, which would be problematic if that provider becomes insolvent or otherwise fails to meet the public's needs. 	<p>Utilities should be allowed to charge pricing that varies to align with the goals of their site hosts (i.e. flat rate, kWh or time-based).</p> <p>Non-utilities should be exempted from restrictions on electricity sales.</p> <p>Utilities should be prevented from cross-subsidizing EV infrastructure unless those same incentives are available to other potential site hosts.</p>

On page 6 of Exhibit C5-2, CoV discusses its Residential Curbside Pilot Project and the Non-Residential Curbside Pilot Project.

- 2.2 Please further discuss these pilot projects including who pays for the installation and ongoing maintenance. How do the residents ensure its “exclusive use?” Are there fees to those residents that invested in the curbside EV charging stations in front of their homes? Are there fees to the general public?

COV Response to IR 2.2: The City of Vancouver sees access to home charging as critical to the long-term transition to zero emissions vehicles. By 2050, some 250,000 zero emissions vehicles could be registered within Vancouver. In order to minimize peak loads on the utility network and to maximize the convenience of using electric vehicles, the City is seeking ways to support residents with home charging. Within Vancouver, many single-family homes do not have access to off-street parking, and hence are unable to currently utilize home charging. The City, like major urban centres that are promoting a transition to EVs, is looking for a solution to this challenge. One response is through two curbside charging pilots initiated by the City in 2017: a residential curbside pilot and a non-residential pilot. The residential pilot is open to residents of single-family homes whose homes are not zoned to have off-street parking stalls.

The City of Vancouver allows for successful residential and non-residential applicants to install EV charging infrastructure within the City right-of-way. In the case of residents, either a 120V or 240V receptacle is allowed. Residents may limit access through physical means (such as a lock box) or other means, such as a switch inside their home. In both residential and non-residential cases, the costs of installation and operation are borne by the applicant. City fees for installation are limited to those for any electrical upgrade work (permitting, inspection, etc). The City does not require any additional pilot project-specific fees.

The non-residential participants may incur additional fees from network providers should they install a networked charging station. Non-residential applicants are required to allow members of the public to use their station but are prohibited from charging fees to the public in accordance with the current Utilities Commission Act restriction. We would reassess that restriction if the restriction under the Act was removed. To maintain consistency with City transportation demand management practices, the City may install an adjacent parking meter at some locations.

Other jurisdictions are investigating public charging options in city ROWs that will allow for residents without off-street parking to access charging infrastructure. In some cases, this work is being undertaken in partnership with municipal or state utilities.

- 2.3 How many EV charging stations and ports are on the City’s public network?

COV Response to IR 2.3: The City presently operates 73 Level 2 charging ports along with one DCFC (total of 48 units). In addition, the City will be installing up to 24 more DC Fast Charging and over 50 more AC Level 2 charging ports by 2021. The City’s goal is to ensure that a DC Fast Charging Hub exists within a 10-minute drive of anywhere in the City, and that this network is supported by Level 2 charging at additional public-facing, City-owned facilities. This expansion is ongoing, with new installations approved and underway at the time of this writing.

C. TECHNOLOGY

3.0 Reference: Exhibit C5-2, pp. 8–9, Exhibit C3-2, p. 2
Open Charge Point Protocol

On pages 8 and 9 of Exhibit C5-2, City of Vancouver (CoV) states: “For the EV charging service owner and operator... the choice of EV charging infrastructure, equipment and technical support would be competitive at the time of purchase....”

On page 2 of Exhibit C3-2, Drive Energy states:

...the EVSE [EV Supply Equipment] owner, who are also clients of vendors, are captive of a monopoly/oligopoly structure in which they are tied to the provider of the hardware (charging station) that they have purchased. As mentioned above, until the smart EVSEs operate on Open Charge Point Protocol [OCP] like ABB, Easton or Tritium DCFCs, all level 2 hardware is tied to the same company to provide payment processing & service and are very vulnerable to uncompetitive monthly fees and payment processing fee hikes.

- 3.1 Do CoV EV charging stations currently use ChargePoint, AddÉnergie or Open Charge Point Protocol (OCP)? Further, will CoV’s next generation EV charging stations use the same software? Please discuss.

COV Response to IR 3.1: The City presently uses Chargepoint and Addenergie stations. The City does not operate any OCP stations.

The City is presently going through a procurement strategy to determine the long-term provision of EV infrastructure, and therefore cannot comment on future plans at this time.

- 3.2 In CoV’s view, based on Drive Energy’s comments, please discuss the degree of captivity in the North American EV charging station market on a (i) manufacturer level and (ii) payment processing and service level.

COV Response to IR 3.2: It should be noted that the comments below do not reflect a general preference by the City for vertically integrated or OCP networks writ large.

As with the purchase of many consumer electronics, a certain amount of captivity exists to a buyer of that equipment. However, it has been the City’s experience that the market is in a growth phase and that competition between hardware manufacturers exists.

Vertically integrated companies present a risk of tying a site host to their specific network, which has ongoing fixed costs. Conversely, these networks tend to be well integrated with the hardware. While certainly possible, it has not been the City’s experience that fee increases have been uncompetitive.

With respect to open network protocols, the number of providers of open network options (including those that provide OCP solutions) is still relatively small in Canada, and to-date these providers have demonstrated limited ability to control or monitor hardware operations.

OCP is more advanced and significantly more common in the EU, for example. While these can theoretically provide a measure of risk mitigation for site hosts by having the ability to change

network providers without changing hardware, it has been the City's experience that little competition between OCPP providers exists at present. The City anticipates competition between OCPP providers is likely to increase over time.

Additionally, it has been the City's experience that while OCPP can provide payment systems with a robust user experience, it is not necessarily true that such systems can provide robust remote monitoring and management of EVSE in the current market state.

Overall, the degree of competition within the market, while growing, may actually be limited by the poor level of roaming and interoperability that the market currently offers. Many site hosts – in particular local governments with numerous existing or prospective locations – may be reticent to try new market entrants if they have engaged an existing provider, or if there is an incumbent provider in the surrounding region. Local governments, utilities and other EV charging network operators can support greater competition by demanding that interoperability be a contract requirement with EVSE manufacturers and network providers especially while networks are still in an early growth phase. It is likely that the market of both open network protocols and vertically integrated providers will become more competitive as these contract conditions become widespread.

3.2.1 What role would the British Columbia Utilities Commission (BCUC) play, if anything, in terms of captivity of a monopoly/oligopoly at the manufacturer level or payment processing and service level? Please discuss in light of the BCUC's jurisdiction as a public utility regulator. Are there other entities that would be more appropriate for such oversight?

COV Response to IR 3.2.1: *It is not the role of the BCUC to regulate this type of competition.*

The Commission should not regulate the types of networks or hardware present within the market, or that are available to non-utility participants. The performance of non-utility participants' infrastructure will be scrutinized by market forces.

The BC provincial government is in a good position to regulate interoperability, similar to the Electric Vehicle Charging Stations Open Access Act in California. Further, some regulation that ensures that different networks can be ported from one hardware brand to another (not necessarily via OCPP) may be warranted. That this is technically feasible has been suggested by numerous providers, although the City has no direct experience with this.

3.3 Please discuss CoV's view on the benefits and drawbacks of using OCPP. Would there be additional costs associated with OCPP?

COV Response to IR 3.3: *As noted previously, the City is presently engaged in a procurement process and cannot discuss this beyond the information provided. The City does not presently operate any OCPP infrastructure, and therefore cannot comment on any associated costs.*

D. RATES

4.0 Reference: Exhibit C5-2, pp. 15, 17; Exhibit C1-2, p. 7 Rate design – EV charging station to EV customers

On page 15 of Exhibit C5-2, CoV states:

For example, the City has chosen to set time-based rates to keep them simple, and aligned with our parking rates. We have also decided to allow those rates to vary from station to station depending on how busy it is – if a station is under-utilized, we will reduce the rate and if it is over-utilized, we will increase the rate.

4.1 Please discuss the pros/cons of establishing a price based on customer utilization rates. What are the customers behaviours that CoV is intending to incent?

COV Response to IR 4.1: In developing a fee structure, the City considered six guiding principles:

- 1. To increase turnover at EV charging stations*
- 2. To have a system that is easy for the public – and particularly new EV users – to understand*
- 3. To encourage those people who have access to home and/or workplace charging to use that as much as possible.*
- 4. To obtain a return on the City's investment in infrastructure.*
- 5. To promote fairness in access to public infrastructure*
- 6. To retain the attractiveness of the low operating costs of an electric vehicle, when compared with a fossil-fueled vehicle.*

The development of utilization-based rates was informed by the City's existing transportation demand management policies with respect to parking, which uses an occupancy-based rate. The rate structure is designed first and foremost to find a balance between keeping pricing as low as possible, while at the same time ensuring that stations remain available to users and parking-related congestion is minimized.

The City notes that user fees have only been in place for approximately 6 months, and as such our direct experience is limited. The following additional learnings can be expected over time as more data points and a larger market develop:

Pros:

- Allow for varying prices that users are willing to pay based on other factors, such as location, scarcity of charging infrastructure, convenience, etc.*
- Allow for adjustment based on changing demand, which will be affected by number of EVs on the road, number of users without access to home or workplace charging, and the number of nearby charging stations.*
- Allow for easy identification of pricing that does not achieve the goals of turnover and availability.*

Cons:

- Some inconsistency in pricing across the city which can be perceived negatively by users of the network.*
- Need for ongoing monitoring of network to ensure pricing is adjusted appropriately.*

4.2 Please clarify which party determines when the pricing at EV charging station should change. What are the criteria which necessitates rate changes?

COV Response to IR 4.2: Pricing is changed by City staff when utilization for a given time period (daytime, evening, or overnight) falls outside of a target range (40-70% utilization during daytime hours). This is determined as a percentage of occupied time of the collective number of stations at a site over a period of months. When occupancy is below the minimum criterion, prices are reduced. When above the maximum criterion, prices are increased.

4.2.1 What has been the customer feedback regarding this type of pricing?

COV Response to IR 4.2.1: Some users were initially unhappy about paying a fee for a service that had been provided for free previously. However, after engagement with customers, they are generally accepting of the fact that prices will change as necessary to maintain availability; and, the City has received positive feedback that stations are more available since the introduction of fees. Complaints of 'squatting' (EV drivers occupying a charging station long after their batteries are fully charged) have decreased significantly.

4.3 How does the CoV communicate the current pricing to potential customers? For instance, is there a CoV EV app?

COV Response to IR 4.3: At present, pricing is communicated in three ways:

1. On the City of Vancouver website at <http://vancouver.ca/ev>
2. On user-driven mapping sites chargehub.com and plugshare.com
3. On the apps and websites for the individual network providers (presently Chargepoint and Flo).

On page 17 of Exhibit C5-2, CoV indicates two concerns regarding BC Hydro's current residential rate structure:

- "The current tiered residential rate structure creates an unintended disincentive for switching to EVs because residents that are using electricity efficiently can still consistently be bumped into the Tier 2 rate."
- "The current residential rate structures don't provide any incentive to shift demands to off-peak time, which is a missed opportunity for BC Hydro to avoid the costs associated with increasing capacity."

4.4 Please provide the CoV's view on alternative rate structures, such as Time of Use (TOU) or a new EV-specific rate class.

COV Response to IR 4.4: The City does not have a detailed perspective on how best to address the barriers that the present rate structures create, but we do see the barriers in practice through various development applications and we are supportive of a range of potential solutions being more fully explored. The following paragraphs outline some of the potential solutions that merit further consideration.

The present rate structure does not provide price signals to residential ratepayers to shift use to off-peak times. The City supports the exploration of residential time of use rates, time-of-use signals within EV-specific rate classes, and EV-specific curtailment agreements (such as that presently being piloted by Burlington Hydro in Ontario) to encourage those individuals who charge at home to move charging to off-peak times.

The present rate structure tiers can become a disincentive for EV adoption because an efficient household could be pushed into the higher tier because of the electricity demand to power an EV.

Potential solutions include raising the threshold for tier 2 and having an EV-specific rate class.

The City would also support exploring a change by BC Hydro to universally allow second electrical services to be provided directly to residential parking areas. This in many cases would decrease the cost of home retrofits, particularly in older homes. BC Hydro presently provides this for many multi-unit residential buildings; however, this could be extended to all residential properties where retrofitting from an existing service is deemed prohibitive.

Finally, the City recommends that a review of the current Demand Charge structure for Medium and Large rate classes be conducted. The present structure imposes a minimum \$250/month cost (Medium General Service) on each DC Fast Charger irrespective of usage, severely impacting the business case for DCFC deployment. A Large General Service Customer will pay a minimum \$550/month for a 50kW DC Fast Charger.

Demand charges are not traditionally designed with low-utilization, high peak load systems like DCFC in mind. The review should include an EV-specific rate structure that de-emphasizes the use of demand charges, and considers other methods to control demand (e.g. by re-examining threshold demand levels). Prior to April 2017, peak demands under a specific threshold were not subject to demand charges. Such thresholds could potentially be re-introduced in such a way as to encourage EV infrastructure – and in particular DCFC – without severely impacting BC Hydro’s distribution network.

On page 7 of Exhibit C1-2, BC Hydro states: “Under this pilot program, site hosts have the discretion to charge a rate for vehicle charging, and currently 16 of 30 station operators charge a rate of \$0.35 per kWh.”

- 4.5 Please explain how the rate of \$0.35 per kWh is determined. Are there any other fees in addition to the \$0.35 per kWh rate that customers pay (e.g. fixed fee, tax, network access fees, parking fee, etc.)?

COV Response to IR 4.5: The City of Vancouver is not in a position to answer this question. It should be posed to BC Hydro directly. However, the City would like to reiterate that our own rate structure was driven by six guiding principles, as listed in IR Response 4.1.