British Columbia Utilities Commission

An Inquiry into the Regulation of

Electric Vehicle Charging Service

Project No. 1598941-Phase 2

Submission by Siemens

January 28, 2019

Introduction

Phase 1

By Order G-10-18, the Commission established an Inquiry to review the regulation of electric vehicle (EV) charging service. In Order G-9-18 dated January 12, 2018, relating to the FortisBC Inc. EV charging service application, the Commission noted that the rate design and rates for EV charging, including the services provided by EV charging stations, are currently in an early development stage in BC and other entities may emerge over time to provide EV charging service. On November 26, 2018, the BCUC issued the Phase 1 Report. In the Phase 1 Report, the Panel recommends that the Minister of Energy, Mines and Petroleum Resources issue an exemption with respect to BCUC's regulation of EV charging services but that the BCUC retain oversight on safety.

Phase 2

Phase 2 of the Inquiry will focus on the regulatory framework for EV charging service providers that are have not been recommended for exemption (e.g. BC Hydro and FortisBC Inc., the non-exempt public utilities).

Siemens

Siemens is a global leader in eMobility and considers eMobility to be a critical element in driving economic benefits from new investments and job opportunities, at the same time achieving the societal benefit of a cleaner environment. We operate in 180 countries and are the first corporation of our size to commit to being carbon-neutral by 2030. Siemens therefore, is a strong supporter of British Columbia's climate goals.

Siemens operates throughout Canada, employing over 4,000 personnel.

Siemens sells a wide variety of technology solutions to a broad spectrum of customers. In general, we sell to utilities, federal and state governments, cities, site owners (both residential and commercial, including for workplace charging), transit authorities, non-utility charging network providers, etc. Siemens' offerings in eMobility encompass what we refer to as the "plug

to grid" hardware and software ecosystem – and cover light, medium, and heavy-duty vehicles as well as off road solutions such as:

- hardware and software for charging light, medium, and heavy duty vehicles;
- software and services, including smart phone apps, for managing charging and engaging electric vehicle and electricity customers;
- make-ready equipment ranging from transformers to service drops;
- utility software to plan, operate, and manage the grid, including integrating EV charging into system operations;
- software to run transmission grids and wholesale electricity markets;
- battery storage and microgrid systems for DC fast charging installations; and
- building management and operations software that can integrate EV charging operations.

Siemens sees eMobility as a pivotal trend not just for people but any item that needs to move from one point to another -- and the goal of our policy efforts is to promote public policies and global best practices to drive market growth and consumer adoption of EVs through lowering the Total Cost of Ownership (TCO).

Siemens submits this evidence to assist the Commission in evaluating a number of issues and questions identified in the Phase 1 Report.

A. Regulatory framework for non-exempt public utilities (pp. 47–48 of the Phase 1 Report)

A.1.1 Can both regulatory models – little or no regulation for those exempt public utilities and the participation of non-exempt utilities – co-exist?

Response:

Yes, exempt and non-exempt public utilities can co-exist. Exempt public utilities have the advantage of local regulation that allows them to be more nimble and flexible. This can include spreading the costs of EV charging infrastructure across all or part of their ratepayers in accordance with local priorities. The non-exempt utilities must follow the cost allocation and recovery requirements of the Commission.

A.1.2 In the absence of price regulation, how can EV charging providers that are not otherwise public utilities (which would be exempt from regulation in accordance with the Panel's recommendation) be protected from being undercut by non-exempt public utilities?

Response:

Price regulation for investments by public utilities is essential to protecting the market for non-utility EV charging providers. The Commission can decide whether EV charging investments by utilities should be recovered from all ratepayers or only those ratepayers actually using the charging services. In the short term, there are good reasons for recovering costs from all ratepayers. First, all EV loads benefit all ratepayers, because the electricity delivered to those EVs is, by definition, incremental and, therefore, results in greater throughput over existing grid infrastructure. The result is that the fixed costs are spread over more kWh. Second, the lack of public charging infrastructure has been cited in surveys as the second highest barrier to EV adoption following the cost of the vehicle.[1] Providing charging infrastructure lowers this adoption barrier and, therefore, promotes adoption. This results in both economic benefits to all ratepayers as well as GHG emission reductions.

Over the long term, cost recovery should be from only participating ratepayers, i.e., EV drivers. The Commission should decide at what time point EV adoption is robust enough to change its cost recovery policy. Given the Province's GHG reduction goals and the importance of EV adoption in achieving those goals, such time point could be 2025 or even 2030.

These two strategies can also be mixed from the start. EV charging markets that are underserved – such as low income, multi-unit dwellings, public agencies, certain public DCFC sites – could have costs recovered from all ratepayers. Others could have costs recovered from only participants. An example of the latter is Xcel-Minnesota's pilot program where the utility has a tariff to provide to single-family homeowners a Level 2 charger, installation, and ongoing maintenance for a monthly fee that recovers all of the costs from the customers selecting that tariff.

[1] - Altman Vilandrie & Co., Private Study. 2017. The findings are summarized at https://ngtnews.com/survey-lack-of-awareness-high-costs-hamper-ev-adoption

A.1.3 Should non-exempt public utilities be restricted to participate only in remote geographical locations that are currently uneconomical for exempt EV charging providers to serve?

Response:

No, non-exempt public utilities should not be restricted to participate only in remote geographical locations that are currently uneconomical for exempt EV charging providers to serve, especially in this nascent market where lack of public charging infrastructure is a major barrier to EV adoption. As noted in the answer to A.1.2 above, non-exempt public utility cost recovery approaches can vary by the use case. For remote locations that are underserved, costs could be recovered from all ratepayers; for locations where exempt EV charging providers already provide service, cost recovery could be limited to only the users of those non-exempt public utility EV chargers. This concept of utilities focusing on underserved markets would apply equally to low income, MUDs, and many public agencies. In California pilots, utilities have found that many government and transit agencies, including school districts, have regulations that make it difficult for them to engage non-utility charging providers and that this segment of customers prefers that the non-exempt public utility provide turn-key EV charging equipment and services.

A.2.1 If the provision of EV charging is exempt from regulation, is there any justification for non-exempt public utilities to provide EV charging services?

Response:

Electrification of transportation is a key driver for achieving the Province's decarbonization goals, including the building of a cleaner, more resilient and affordable energy and transport system. In order to do so, British Columbia needs to fully leverage non-exempt public utility assets and capabilities to maximize the benefits associated with EV ownership and operation to animate the market. In our opinion, the charging market should be open to all relevant participants, including the non-exempt public utilities. Several U.S. states have reached the conclusion that non-exempt public utility participation in EV charging is not only beneficial but, in some cases, necessary, to achieve state policy goals for EV adoption. Within the last few months alone, public utility commissions in Florida, Washington, Oregon, Massachusetts, Nevada, Ohio, and California have approved non-exempt public utility investments in EV

charging infrastructure. **Contrary to arguments made by a minority of parties, we have not seen a single instance where non-exempt public utility participation has harmed competition in the EV charging infrastructure market.**[2]

EVs offer the obvious benefit to their owners (or operators) of providing transportation and to society of reducing air emissions. However, EVs also offer important benefits (or can impose additional costs) to the electricity grid, wholesale electricity markets, and integration of both centralized and distributed renewable generation. For the grid, EVs can provide peaking capacity and, thus, act as a non-wires alternative to traditional grid reinforcement when there is a need for additional capacity. For wholesale markets, EVs can provide peaking capacity and ancillary services such as imbalance energy. For renewable generation, EVs can reduce curtailments by using wind and solar energy at times of abundance (over-generation). We refer to these as the full value stack of EV benefits.

These benefits are widely recognized, but there is less discussion of how to capture the benefits. Capturing the full value stack requires:

- an <u>end-to-end integrated system approach</u> that is only possible via the active involvement and participation by the non-exempt public utility either alone or working with third-party service providers;
- <u>seamless, low-cost, reliable, and efficient integration of EV charging data and operations</u> with non-exempt public utility planning, operational, business, and customer systems; and
- <u>a robust connection</u> with wholesale operational and market systems.

Utility planners can minimize their grid investment requirements if they know where and when EV charging loads are occurring and how those loads will grow over time. Utility operators can maintain reliability by having the same information in near real time, as well as the ability to either control such charging or accurately predict how EV owners (or their third party service providers) will control such charging in response to price signals. Utility customer engagement and charging management software can send price or control signals to smart phones and directly

[2] - Reply Brief of eMeter, a Siemens Business, Greenlots, and Electric Motor Werks on the standard Review Transportation Electrification Proposals, California Public Utilities Commission, December 21, 2017.

to chargers/Electric Vehicle Supply Equipment (EVSEs) or third party service providers, as well as allow consumers to program their charging preferences. Utility demand response program operators can use the EV data to bid peak demand reductions and ancillary services into the wholesale market. These are just a few examples.

Similarly, the Province needs to fully leverage non-exempt public utility assets and capabilities to **minimize the costs** associated with EV ownership and operation to animate the market.

Utilities also have important assets and capabilities to reduce the total cost of ownership (TCO) – buying, owning and operating EVs. Lowering the TCO is critical to adoption of EVs. Of course, capturing the full benefits as described above directly reduces operating costs by minimizing electricity costs, including costs that might otherwise be required to reinforce the grid. **Utilities can greatly reduce costs in three key areas: asset ownership and maintenance, chargers, and the consumer experience.** In many situations, such as home charging – where 70% of charging is expected to occur – utilities can have the greatest ability to reduce these costs when they own EVSEs.

A core competency and central business model element for utilities has always been asset ownership and maintenance. They specialize, in part, in the distribution grid, which consists of very large numbers (millions) of widely dispersed devices that must operate safely and reliably with low maintenance costs for periods of decades. EVSEs are exactly this type of asset and, in fact, have many features in common with smart meters (data recording, communications, electronics in harsh environments, etc.). Utilities have the necessary expertise, business processes, and software for deploying, managing, and maintaining these assets.

Utilities can play a major role in reducing EV charger costs as well. One way is by procuring larger quantities of EVSEs. Another way of reducing costs is standardization, including promoting "smart chargers" with communications and metering capability. For example, just as all home networks run on WiFi, chargers should use common communication protocols. Also, where cost-effective, chargers should have built-in metering sufficiently accurate to allow billing of EV-only tariffs – customers may not want dynamic pricing for their homes or businesses, but usually want it for their EV. These standard features allow for interoperability – a key requirement for cost reduction – and reduced risk of obsolescence. Regulators should not require

specific standards but instead to make the point that such standards are essential to both short- and long-term cost reductions.

Utilities can also play a major role in minimizing consumer experience costs, a major barrier to EV adoption. For example, utilities can substantially reduce charging-related concerns and uncertainties for consumers when buying an EV. The non-exempt public utility can assist by being the trusted energy adviser regarding charger availability and requirements. Where the non-exempt public utility manages the solution, the consumer can rely on the non-exempt public utility's experience, expertise, longevity, service delivery capability, service reliability, and other strengths in providing and maintaining the EVSE. The consumer can rely on the non-exempt public utility's objectivity in qualifying EVSEs, estimating EV charging costs, helping manage EV charging hours for time-varying rates, and so on.

Utility ownership of EVSEs should be permitted, because such ownership provides compelling benefits and actually promotes competition.

A major reason to allow the non-exempt public utility ownership option is that such ownership is the lowest cost and most reliable means of creating end-to-end technical solutions for electric vehicles as distributed resources to "assist in grid management, integrating generation from eligible renewable energy resources, and reducing fuel costs for vehicle drivers who charge in a manner consistent with electrical grid conditions." (Note that the distributed resource is the electric vehicle itself, not the EVSE.) Another reason is that many markets are not served by third-parties, such as low-income, multi-unit dwellings, and school districts and transit agencies (for eBuses). Making these EVs grid assets requires linking wholesale markets or grid conditions with non-exempt public utility software applications managing the grid with communications solutions linking to the EVSE and management of the EVSE itself. Ownership gives the non-exempt public utility the maximum level of control in selecting and implementing elements of the solution in order to verify functionality, performance and operability.

The non-exempt public utility ownership option reduces the risk of stranded costs as well, by shifting more of the risk to the non-exempt public utility and because the non-exempt public utility is in better position to bear the risk. When the non-exempt public utility owns the EVSE it has greater flexibility and incentive in selecting and testing EVSE to verify long-term reliable

operation. The non-exempt public utility has field crews throughout its service territory that can maintain, repair, or even relocate EVSE – crews that, with certainty, will be in place for the life of the EVSE. The non-exempt public utility has, and will have, the expertise to select and manage EVSE. If a customer chooses an EVSE from a company that exits the market five years from now, the non-exempt public utility-provided funding for that EVSE could well become a stranded asset – but would not be if the non-exempt public utility could take over ownership. Similarly, if a customer sells the EV or relocates, the non-exempt public utility can retrieve the EVSE and reinstall it elsewhere. Finally, utilities buying EVSE are better positioned to drive standards and interoperability – both of which reduce the risk of stranded assets.

The Commission should ensure that the customer has the choice to decide the model of EVSE ownership they desire by allowing the consumer option of choosing non-exempt public utility ownership. Consumers may choose to opt for a third-party as well. Selecting, installing, and maintaining a smart (networked) Level 2 or DC EVSE is complicated and unfamiliar, a reason why many consumers or site-owners do not want the burden of selection on themselves, but, instead, want the choice of non-exempt public utility ownership as part of a convenient, turn-key solution. An EVSE is not like a home appliance. Selecting and installing a grid-supporting smart EVSE should not be equated with selecting and installing a refrigerator. Many consumers want a trusted entity to provide a convenient and reliable solution; with the non-exempt public utility ownership option, that solution can include selecting equipment, arranging for installation, operation, maintenance, repair, customer service, removal, and warranty. This is specifically true of complex deployments in medium and heavy duty categories such as transit bus depots or truck stops.

The non-exempt public utility ownership option allows for customer choice of the more consumer-oriented features related to a smart EVSE. An EVSE's advanced features (viewing of charging consumption data, remote control, etc.) require software applications or service providers. This is where customers desire more choices, and these can be provided by the non-exempt public utility or third parties, as is the case for smart meter data applications (such as viewing consumption data on a smart phone).

Another benefit of the non-exempt public utility ownership option is scale economies. A non-exempt public utility buying even just 100 EVSE will get a much better price than a site-owner

buying two or ten units. This is critical in driving down and managing costs, especially where the ratepayer is funding the programs.

Based on our global experience, as well as our ongoing observation and analysis, the non-exempt public utility ownership option is neither anti-competitive nor anti-innovation. First, those opposed to non-exempt public utility ownership of EVSE have not provided an actual case of such ownership having a negative effect on competition. Second, EVSE providers will still be selling their EVSE in the charging market, with equal opportunities to participate in non-exempt public utility procurements. Third, the market for EV chargers will be larger. Fourth, non-utility entities will remain free to compete to sell to EVSE users and site owners or expand their own public charging networks, leveraging whatever advantages they have. Our belief is that the non-exempt public utility ownership option has many benefits but that third-party ownership can also have advantages in a number of situations as well – and that having open markets with participation by both utilities and third parties will allow markets and customers to determine the optimum long-term ownership mix. Consumers should have choice, and the non-exempt public utility ownership option should not be taken away from consumers.

Moreover, the non-exempt public utility ownership option drives innovation. Vendors selling to utilities compete intensely on price and product capabilities, including features and reliability. Siemens sees this every day in thousands of non-exempt public utility procurements for everything from transformers to smart meters. Utilities are sophisticated buyers who demand the latest capabilities and ongoing improvement. This intense competition drives robust and rapid innovation, as well as price competitiveness – with companies like ours spending very large amounts on research and development to remain competitive.

So long the Commission ensures that the non-exempt public utility role is not anti-competitive, in our opinion there are no specific problems to non-exempt public utility participation in the EV charging market.

A.2.2 If the role of non-exempt public utilities is to kick-start the market, how can the BCUC determine when the kick-start is no longer needed?

Response:

For the Commission to determine when the kick-start for the provision of charging services by non-exempt public utilities is no longer needed, it will have to rely on metrics that include but are not limited to customer surveys, average distance between public charging stations, density of chargers, average wait times, charging prices (i.e., is competition keeping them down), and other factors. This will vary depending on the specific market being served from among the following:

- Workplaces and retail locations
- Highway corridors
- Urban and suburban public DCFC depots
- MUDs
- Public agencies
- Single family homes
- Others that the Commission may identify over time

When such metics reveal that the relevant charging service is readily available and accessible, the non-exempt public utilities should either focus on providing platform services that enable the private market or change the cost recovery so that all of the non-exempt public utility costs are recovered from users of that particular service.

A.2.3 What is the role of those utilities once that kick-start is completed?

Response:

Those utilities can stop adding new sites, equipment, or services to the relevant market as explained in our answer to A.2.2 or change the cost recovery policy to recover all costs from participating customers. The non-exempt public utilities should continue to operate any installed equipment through the planned life (typically 10 years).

A.2.4 If there are stranded assets at that time how should they be dealt with?

Response:

Provided the Commission monitors market development as described in our answer to A.2.2 and adapts policy in a timely manner, the level of stranded assets should be minimized. Two

additional reasons that stranded assets should be minimized are that this is a rapidly growing market and non-exempt public utilities are conservative in making investments. We would encourage non-exempt public utilities to deploy equipment that follows industry-accepted open communications standards, such as OCPP, as well. Therefore, they would be able to sell their equipment to other service providers should the non-exempt public utilities desire to exit the business.

A.3.1 If non-exempt public utilities participate in the EV charging market, should EV charging customers constitute a separate class from which costs associated with EV charging infrastructure is recovered?

Response:

Please see our response A.1.2 above.

A.3.2 Or should the service be offered in a separate non-regulated business?

Response:

The non-exempt public utilities should be able to offer the service on both the regulated and non-regulated side, in accordance with the considerations we described in our response A.1.2 above.

A.3.3 What are the implications of each of these regulatory models?

Response:

If the service is offered by the regulated business, the Commission retains oversight and can ensure the program is consistent with the Province's goals for EV adoption and GHG emission reductions. **Such oversight includes factors such as ratesetting and safety, equity in providing access to low-income customers, and others**. If the service is offered by a non-regulated business, the Commission has minimal to no oversight and there is no guarantee that the EV charging services will promote the Province's goals. Non-regulated providers have a fiduciary duty to their shareholders to maximize their financial earnings. They have no duty promote any of the Province's goals or operate in a fashion consistent with those goals. **In short, the Commission, through its oversight of regulated businesses, can seize this opportunity for the Province's citizens in a way that maximizes the benefits to ratepayers**.

A.4.1 Should other customer classes of non-exempt public utilities subsidize costs associated with the provision of charging services that can't be recovered from EV charging customers?

Response:

No customer classes should be subsidizing EV charging customers. The non-exempt public utility should provide a showing that the benefits to non-participating ratepayers of providing EV charging services are expected to exceed the costs to non-participating ratepayers. In such a case, which has been found for a large number of geographies, non-participating ratepayers are actually being subsidized by EV drivers. For example, in BC Hydro's 2018 annual report, commodity costs made up only 28.4% of revenues.[3] If EV charging is managed such that EV loads impose no new capital or non-commodity operating costs, the result is a net benefit margin of 71.6%. The average revenue per kWh is 9.7 cents, so the average net benefit per kWh is 6.95 cents.[4] Assuming 100,000 miles per vehicle over 10 years and 34 kWh per 100 miles,[5] the EV driver will be purchasing 34,000 kWh. Therefore, at 6.95 cents benefit per kWh, **the average EV is providing a net benefit to non-participating ratepayers of $2,363** (per 10 years of life).

Also, please see our response A.1.2 above.

A.4.2 How much of the cost is it appropriate for them to subsidize – should there be a cap?

Response:

Please see our response A.4.1 above.

A.5.0 If assets are stranded as a result of changing technology or other factors, who should pay for the potential stranded EV charging assets which may be in the non-exempt public utility's rate base?

Response:

As noted in our response A.2.4 above, the risk of stranded assets is low and can be further minimized. To the extent stranded assets still occur, they should be recovered using the same methodology used to establish cost recovery for those assets in the first place.

[3] BC Hydro, 2017/18 Annual Service Plan Report, July 2018.
[4] Ibid.
[5] U.S. Department of Energy, https://afdc.energy.gov/fuels/electricity_charging_home.html

A.6.1 In the context of BCUC economic regulation, what regulatory justification is required to allow existing utilities to cross subsidize EV charging services?

Response:

A cost benefit analysis showing positive net benefits to non-participating ratepayers should be the economic test for approving EV charging programs. As noted in our response A.4.1, this method of evaluation will prevent cross-subsidization.

A.6.2 If EV charging services add incremental load, does that justify cross-subsidization?

Response:

There is not a question: EV charging is, by definition, incremental load. As described in our response A.4.1, **EV drivers are subsidizing non-participating ratepayers** by adding new load to the system without requiring any increase in grid investment or operating costs.

A.6.3 Would the incremental load appear without the subsidization?

Response:

Without non-exempt public utility involvement in providing EV charging, less, perhaps far less, incremental load will appear. In the U.S., most states have very little EV adoption, and those states have very little participation by non-exempt public utilities in EV charging.

In contrast, California has state policies driving EV adoption, as well as significant participation by utilities in EV charging. As a result, it has very robust EV adoption, accounting for about half of all U.S. sales. The EV market is highly dependent on removal of barriers, such as a lack of public charging infrastructure. Having said this, **subsidization is not needed**. kWh consumed by EVs provide a large net benefit to non-participating ratepayers as described in our response A.4.1. The thing that is needed is policies that enable utilities to participate in providing EV charging infrastructure in a manner that provides for fair and reasonable cost recovery.

A.7.1 What are the implications of the province's energy objectives, as stated in the Clean Energy Act, with respect to non-exempt public utilities providing potentially subsidized EV charging services?

Response:

California has concluded that the participation of utilities in providing EV charging infrastructure is an essential tool in the state achieving its aggressive GHG reduction targets through electrification of transportation.[6] We believe the same tool is needed to achieve the Province's goals in the Clean Energy Act.

A.7.2 Are there noneconomic justifications such as environmental benefits or meeting greenhouse gas reduction targets?

Response:

Yes. Transportation is the leading source of GHG emissions in the Province, accounting for 38% of all emission in 2016, the latest year for which data are available.[7] Unfortunately, **the trend is in the wrong direction, with light-duty vehicle emissions growing by 14.6%** in the past 10 years. The Province's goals are a 40% GHG reduction by 2030 and 80% by 2050. Therefore, the math is clear: the only way the Province can achieve its GHG targets is through a significant reduction in transport-related GHG emissions.

A.8.0 If non-exempt public utilities participate in the EV charging market, do they have any obligation to serve EV charging customers?

Response:

In our opinion, non-exempt public utility-provided EV charging services should be available to all customers on an equitable basis and reflecting the cost to serve.

A.9.0 Should non-exempt public utilities be provided the same exemptions in regard to EV charging services as are other EV charging market participants? This includes exemption from Part 3 of the UCA, with similar retentions of certain sections by the BCUC.

Response:

We do not respond at this time but reserve the right to do so in the future.

[6] - Senate Bill 350.
[7] - Climate Action in B.C. 2018 Progress to Targets, December 2018.

A.10. 0 Any other comments that may be helpful to the Panel.

Response:

Utility ownership and direct procurement of EVSE can support competition and a leveled playing field in the marketplace for EV charging products and services by acting as a market catalyst, rather than a market constraint. Competitive solicitations foster competition—with decisions based upon features, functions, track record, and price rather than existing market share or corporate resources. By incorporating requirements for open standards in the hardware and software utilized in non-exempt public utility programs, this allows for ongoing innovation and competition—from the initial procurement decision and throughout the life of the equipment—while also hedging against stranded, proprietary assets.

Additionally, any program that breaks down charging infrastructure barriers inherently helps all market participants by supporting EV adoption and purchasing decisions, creating a virtuous cycle for drivers and electric vehicle charging equipment and service providers. Where more infrastructure is deployed, more drivers adopt EVs, improving the business case for charging such that more charging can be deployed, which, in turn, draws more drivers to adopt electric vehicles.

Regarding technical standards, we would encourage the utilities to adopt industry-accepted open standards for the communication of data between EV chargers and the back-end network system or "cloud." The issue relates to whether or not EV chargers are inherently dependent on a proprietary communications protocol (i.e. whether the chargers are "interoperable"). If Charger A works only with Network Service A, the risk of stranded assets is increased. This situation locks in the site owner to a single provider of both the charger and the software/network service—with the inherent risk that the provider could exit the market and potentially strand the assets or not continue to provide the level of service or functionality desired by the site owner. If the communications protocol is open, then any charger is compatible with any network service, virtually eliminating the stranded asset risk. This approach provides the site owner flexibility to move between different chargers and different network service providers in the future for cost-related or any other reasons. For example, virtually all EVSE manufacturers make products that utilize the Open Charge Point Protocol (OCPP), an open standard, between the charger and the

cloud. Therefore, the adoption of open communications protocols directly enables competition and innovation, and therefore greater customer choice, while directly avoiding stranded costs.

Regarding payment standards, utilities should ensure that all stations at public locations support payment by credit card, in addition to other payment options that may be offered. Specifically, in ensuring support for credit card payment at these locations, utilities should incorporate a requirement for credit card readers. Visitors would expect to be able to pay at these public charging stations just as they would at parking meters or gas stations, and while roaming agreements, proprietary payment cards, or fobs provided by private companies may be suitable for many other locations, the importance of maximizing customer access and the perception of easily available public charging makes it especially important to ensure customers can pay by credit card at these locations. This approach would ensure that the greatest number of customers have access to these public stations and would enable greater customer choice and access,

B. Wholesale rate (p. 49 of the Phase 1 Report)

B.11.0 Is there a need for a specific tariff provisions for the wholesale provision of electricity for the purpose of EV charging?

Response:

Based on our global experience, we are not aware of any reasons that a specific tariff for the wholesale provision of electricity for the purpose of EV charging is required.

B.12.1 If so, how should this wholesale tariff be designed?

Response:

Not applicable.

B.12.2 Is a time of use rate appropriate?

Response:

Time-of-use rates are essential for EV charging. Level 2 chargers operate at over 7 kW and could easily triple the peak load of a residence. If confined to off-peak periods, such loads require no

grid reinforcement and, thus, fulfill the goal of being entirely a net benefit to the distribution system (of course the charging consumes additional kWh from the wholesale system). Off-peak rates also allow EV owners to benefit from the inherently lower cost to serve during those time periods, lowering the cost of fuel, promoting EV adoption, and, ultimately, creating even more net benefits for non-participating ratepayers.

B.12.3 Should there be any differences depending on the type of EV charging – Level 1, Level 2, and/or DCFC stations?

Response:

Rates should reflect cost of service and should not be designed with any particular technology in mind, including EV charging.

C. Safety (pp. 38 and 48 of the Phase 1 Report)

C.13.0 Section 3 of the Electrical Safety Regulation states that it "does not apply to a public utility as defined in the Utilities Commission Act in the exercise of its function as a utility with respect to the generation, transmission and distribution of electrical energy". Further, "distribution equipment" is a defined term in the UCA. Although it seems clear that EV charging equipment is not "generation or transmission", the Panel did not make any finding in the Phase 1 Report on whether EV charging infrastructure is "distribution equipment." The Panel invites submissions on this issue in Phase 2. In responding, Interveners are requested to consider the status of the provider – for example, is the interpretation different for a non-exempt public utility than it would be for an exempt utility or a provider excluded from the definition of a public utility?

Response:

EV chargers should be considered "distribution equipment", because they are involved in the final step of distributing electricity to a customer's load. They are analogous to meters and circuit breaker boxes – the "service entrance" – that every customer requires. EV chargers should meet the same safety standards as other service entrance equipment.

D. Greenhouse Gas Reduction Regulation (p. 52 of the Phase 1 Report)

D.14.0 In Phase 2, the Panel invites submissions from Interveners on whether amendments to the Greenhouse Gas Reduction Regulation to allow public utilities to own and operate EV charging stations as a "prescribed undertaking" are appropriate and if so, the appropriate extent and scope of such undertaking.

Response:

In our opinion, the Province should amend the Greenhouse Gas Reduction Regulation to allow public utilities to own and operate EV charging stations as a "prescribed undertaking". The scope should include the provision of EV charging services for the variety of markets listed in our response A.2.2 above. We respectfully suggest that the extent of such undertaking should be in accordance with the entirety of our responses in this document.