AddENERGIE
Solutions de recharge | Smart Charging Solutions

June 6, 2018

VIA EMAIL

Patrick Wruck
Commission Secretary
British Columbia Utilities Commission
900 Howe Street, Suite 410
Vancouver, BC V6Z 2N3

Travis J. Allan
VP Public Affairs and General Counsel
AddÉnergie Technologies Inc.
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Dear Mr. Wruck:

Re: British Columbia Utilities Commission (the Commission) – An Inquiry into the Regulation of Electric Vehicle Charging Service – Project Number 1598941
Response to Commission's IR No. 1

AddÉnergie Technologies Inc. submits its responses to Commission IR No. 1 in accordance with the Commission's amended regulatory timetable pursuant to order G-96-18 for the above-referenced Inquiry.

Should you have any questions, please feel free to contact me at 1-877-505-2674 X 296.

Sincerely,

ORIGINAL SIGNED BY:

Travis J. Allan

CC : L. Tremblay

A. INVESTMENT DECISION

1.0 Reference: Exhibit C20-2, pp. 2–4, 9

Investment / future competitiveness

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

> Direct current fast charger (DCFC) and multi-unit residential building (MURB) home charging are unlikely to be widely and comprehensively deployed in British Columbia without public utility involvement...

On page 9 of Exhibit C20-2, referencing public DCFC and curbside and MURB residential charging, AddÉnergie states:

> A competitive market serving all British Columbians is unlikely to develop without significant utility investment.

1.1 In other jurisdictions that AddÉnergie is active in, have private third-party investments in DCFC stations been observed? If so, please explain any key differences with BC.

<u>Response</u>:

AddÉnergie has observed relatively limited private third-party investment in public DCFC stations in other Canadian jurisdictions without significant utility and/or government involvement and funding.

1.2 Please discuss whether AddÉnergie believes that there are circumstances where a competitive market could develop naturally for DCFC, curbside, or MURB residential charging, or for particular geographic locations in BC.

<u>Response</u>:

AddÉnergie believes it is possible that a competitive market for privately owned and operated DCFC could develop in some regions of British Columbia if they have a large concentration of EV users, particularly if BC's electricity rates are amended to improve the economics of DCFC station operation (Refer to Exhibit C20-2 page 8) and clarification is provided by the BCUC that private parties are permitted to recover costs for EV charging services.

As noted in AddÉnergie's original submission, however, this is unlikely to occur without a comprehensive and robust EV charging network in place to support EV adoption and is unlikely to occur naturally in less densely populated areas of the province (the regulatory "chicken and the egg" challenge). In other words, private companies are likely to focus on densely populated regions, while less dense regions go under-served.

It is possible for a competitive market for MURB installation to develop in buildings that are EV-ready, meaning that it is relatively inexpensive to install Electric Vehicle Supply Equipment (**EVSE**) in most or all individual parking spaces. This would apply, for example, in buildings developed under the newly-revised building by-laws of the Cities of Richmond and Vancouver, which have shown strong leadership on EV-ready building policy. For many existing MURBs, however, the high initial cost of developing EV-ready electrical infrastructure to allow for widespread EVSE installation is likely to act as a significant barrier to competition until a significant number of strata owners in a building are interested in investing in major infrastructure retrofits, at which point the high upfront costs can be spread over multiple users. AddÉnergie does not expect this to happen quickly for many existing buildings.

AddÉnergie has not seen a situation in which significant curbside EVSE deployment has occurred without significant involvement from utilities and municipalities because of the significant cost and regulatory challenges associated with that form of charging, challenges associated with removing or occupying on-street parking and complexity around metering and connections to existing electrical infrastructure.

1.3 Please discuss whether AddÉnergie has a view on how an EV charging market comprised of a significant proportion of public utility owned EV charging could transition to a competitive market.

Response:

AddÉnergie submits that a utility could be required to return to the Commission to seek instructions regarding ongoing investments in EV charging (i) after a set time period; or (ii) after an asset (for example a DCFC charging station) has depreciated. Evidence to support a determination on this point could include either documentation that the option to bid on taking over a charging station had been offered to qualified third parties or a study of local EV charging competitiveness.

During the period in which utilities are permitted to invest in EV charging equipment, AddÉnergie submits that the single most important factor in preserving the possibility of a competitive markets is to ensure that any BCUC-approved rates for EV charging services do not unduly undercut market rates for similar DCFC public charging services.

1.3.1 Please discuss if AddÉnergie has a view on any key indicators that would demonstrate that the EV charging market or sub-set of the market (such as DCFC) is sufficiently mature to operate competitively. 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:

For DCFC stations outside of densely populated urban areas, AddÉnergie supports the modeling that the BC Ministry of Mines, Energy and Petroleum Resources (MEMPR) notes it is obtaining in its submission (Refer to Exhibit C19-2 page 6), and further agrees that a 50-kilometer distance between public DCFC stations likely makes sense in many circumstances, for example primary and secondary highways, although adjustment may need to be made for areas with high vertical climbs or particularly cold winter climactic conditions.

For urban areas, AddÉnergie suggests that a measure of driving time may be appropriate, for example, ensuring that all residents are within a certain minimum time from a public charging station, under typical driving conditions. An alternative approach could be to look at coverage of major intersections or thoroughfares. In urban areas it is particularly important to ensure broad coverage to support residents who are unable to charge at home, for example in some MURBs, and who are therefore especially reliant on DCFC and other forms of public charging.

For MURBs, the test of whether the market for EVSE installation is competitive is relatively more straightforward—it could be based on the cost, as estimated by a licensed electrician, of installing EVSE at an individual parking space in accordance with all applicable strata by-laws and applicable law. If the cost for an individual installation (which may necessarily include upgrading a building's electrical capacity to permit individual installations) is much higher than the cost of installation in a typical EV-ready new build, then installation likely will not be competitive, and utility involvement is likely desirable to resolve the lack of competition.

For curbside installation, AddÉnergie is not aware of indicators that could demonstrate that this sub-market is sufficiently mature to operate competitively because of the specific regulatory barriers restraining development.

2.0 Reference:

Exhibit C20-2, p. 6

Exhibit C15-2, p. 2

DCFC - third-party investment

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

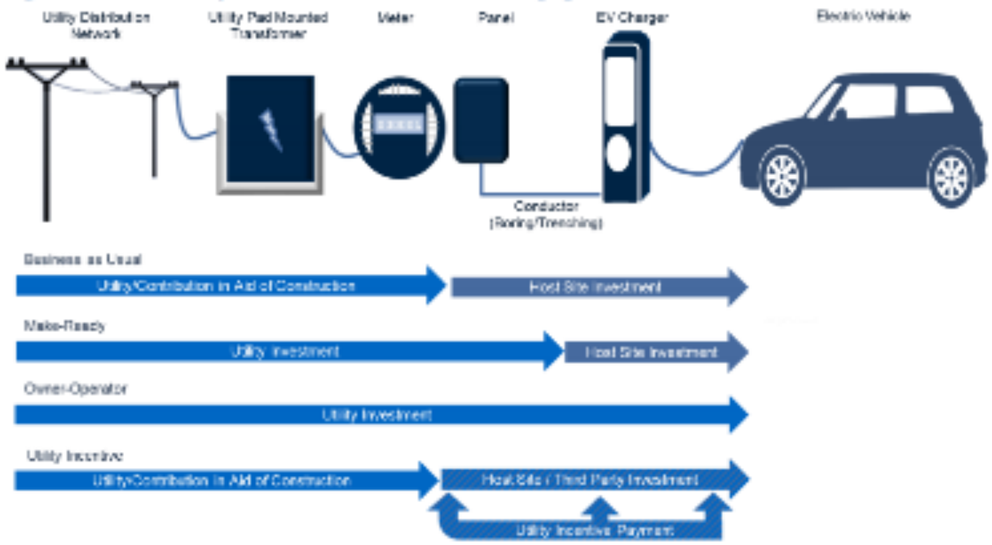
> That the major barrier to EV charging station competitiveness is that British Columbia lacks a comprehensive network of charging stations and that one is unlikely to be developed by [third-party] investment alone.

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 [by] Georgetown Climate Center and by M.J. Bradley & Associates, titled "Utility Investment in the Electric Vehicle Charging Grid: Key Regulatory Considerations" dated November 20171 (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.

Figure 1. Models of Utility Investment in Electric Vehicle Charging Infrastructure



Source: M.J. Bradley & Associates

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.

Response

1. *Business as usual*

A business as usual approach is unlikely to support the development of the comprehensive and robust charging network needed to support provincial EV adoption goals or to provide all British Columbians with access to reliable EV charging services where they need them. This, in turn, is likely to restrain market growth. It is therefore not an appropriate model to increase competitiveness for any of the three types of charging that face particular market barriers.

2. Make-ready

AddÉnergie submits that make-ready investments by utilities can help remove some, but not all barriers to EV charging infrastructure deployment, thereby supporting market growth where the only barrier is the cost of make-ready infrastructure. This could be the case, for example in some MURB parking lots where the cost of secondary distribution infrastructure, trenching, wiring and/or upgrading building electrical capacity are the primary barriers to EVSE installation in private parking spaces. This may also be the case for some DCFC stations where demand is expected to be both high and dependable (high enough to cover station capital expenditures and the full range of operating and maintenance costs).

In both cases, however, permitting a utility to cover make-ready costs only, without allowing it to recover any charging revenues, has at least two major drawbacks. First, this approach unnecessarily impacts ratepayers overall by preventing utilities from recovering their costs via charging revenue collection, which could otherwise help defray overall rate impacts. Second, this model fails to fully take into account utility expertise and specialized demand response programs that can minimize overall installation costs (by avoiding the need to invest in new distribution infrastructure in some cases) and support overall distribution system protection and management as EV uptake increases.

3. Owner-operator

As noted above, an owner-operator model is preferable in situations where the market is not providing sufficient choice for EV charging infrastructure, including underserved areas that require DCFC coverage, MURBs installation or curbside charging. AddÉnergie submits that it is the most likely way to ensure the deployment of the comprehensive and robust charging network needed to allow all British Columbians to access vehicle electrification and to achieve provincial electrification objectives. Allowing for utility participation also unlocks significant potential for BC utilities to leverage targeted load management and load shaping that could minimize overall installation costs and protect BC's electrical distribution grid.

Negative impacts on both competition and ratepayers can be minimized by ensuring that a robust system is in place to vet utility investments in charging infrastructure based on objective assessments of need, existing charging infrastructure and anticipated competitiveness impacts, with particular emphasis on ensuring that charging fees to end-users are set at a reasonable rate to avoid preventing competition from the private sector as EV adoption increases.

4. Utility incentive

AddÉnergie has seen significant positive impacts from utility and/or government charging equipment installation incentives in jurisdictions in which it operates. These programs can help build awareness and encourage consumers considering adopting EVs to purchase charging equipment. Incentives are unlikely, however, to be sizable enough to address the significant barriers to comprehensive and robust DCFC and MURB charging installation without other utility participation.

Most existing subsidies and funding opportunities with which AddÉnergie is familiar focus mainly on the capital costs of deploying infrastructure. In fact, maintenance, energy, customer service, repairs, network and other operational fees are typically a significant portion of the lifetime overall charger costs. Typical capital incentives are unlikely to address the risk that some incentive recipients will walk away from stations that prove unprofitable to operate in the short to medium term, or that they will fail to maintain them appropriately. In situations where strategically important stations (i.e. stations that complete a desired provincial charging network) are expected to run at a net loss for a number of years while the EV charging market develops, a utility own-operate model is more likely to ensure that stations continue to operate with appropriate maintenance and quality than a subsidy program.

In the case of curbside charging, utility incentives are not likely to address the specific regulatory and land-ownership barriers related to charging station deployment without additional utility and municipal involvement.

3.0 Reference: Exhibit C20-2, p. 8, Appendix A

DCFC business model and economics

On page 8 of Exhibit C20-2, AddÉnergie states:

> The Generic Model attached at Appendix A illustrates how a cost model without demand charges can improve the number of charging scenarios (i.e., by increasing the number of daily DCFC users) in which a DCFC charging host can recover its reasonable capital and operational cost expenses within 10 years.

3.1 Please confirm that the 10 year recovery period is a reasonable proxy for the useful life of a DCFC station currently available in the market.

Response

While DCFC station technology continues to evolve at a rapid pace, AddÉnergie submits in its best judgement that the typical useful life of a DCFC charging station is between 5-10 years with recommended on-site maintenance and use in accordance with manufacturer specifications. Initial installation costs (including civil and electrical works), which represent a significant proportion of initial capital expenditures, have a typical life that is greatly in excess of 10 years.

In Appendix A of Exhibit C20-2, AddÉnergie provides a Generic DCFC Financial Model.

3.2 Please elaborate on the basis for the following assumptions:

3.2.1 Capex for 1st station.

Response

While every charging site is unique, AddÉnergie suggests that this is a reasonable estimate of typical costs associated with upgrading existing electrical and civil infrastructure for DCFC station installation plus the cost for a typical DCFC charging station currently on the market in British Columbia.

3.2.2 Incremental CAPEX for subsequent stations.

Response

While every charging site is unique, AddÉnergie suggests that this is a reasonable estimate of typical costs associated with adding a second typical DCFC charging station currently on the market in British Columbia. This cost is lower than the Capex for a typical first station because many of the electrical and civil upgrades for the first station also typically support a second charging station, so long as the first station is planned appropriately.

3.2.3 OPEX (maintenance and networking fee).

Response

This is a conservative estimate of maintenance costs and networking fees based on AddÉnergie's typical experience. Actual costs change depending on factors such as station location and climate, installation quality, station quality, frequency and thoroughness of preventative maintenance and use.

3.3 Please discuss whether, in AddÉnergie's view, there is likely to be a material change to any of the EV charging station operation assumptions and charging station usage assumptions in the next five years.

Response

We are in a rapidly evolving market, meaning that changes in batteries and charging technology, and required charging equipment are likely.

3.3.1 Please comment on the possible impact of such changes on the conclusion that "There are relatively limited scenarios in which a station is likely to recover costs within a decade."

Response

AddÉnergie believes the changes discussed in response to IR 3.3 mean that electrical infrastructure supporting charging equipment should be sized to anticipate future higher voltage needs so that, as station use increases, additional charging units or faster charging units can be added without requiring major electrical upgrades.

At this point, AddÉnergie does not believe these potential changes materially change the original conclusion noted above as it relates to areas of the province of British Columbia that are not currently experiencing very high DCFC use levels.

3.3.1.1 If the conclusions were to change in future, would AddÉnergie consider that public utility involvement in the DCFC market would remain appropriate?

Response

AddÉnergie's position is that utility involvement in the DCFC market should be based on demonstrating a lack of competition for DCFC charging services at the time of investment, meaning that involvement should be assessed against technologies and charging station economics and availability at the time when the investment decision is being assessed.

B. TECHNOLOGY

4.0 Reference: Exhibit C20-2, p. 8

Dependability and quality of public charging services

On page 8 of Exhibit C20-2, AddÉnergie states:

AddÉnergie submits that the dependability and quality of public charging services provided to the consumer should be a central consideration in rate setting. Providing quality equipment, maintenance, monitoring and timely repairs is essential to building consumer trust and to avoid safety and convenience concerns that can result from consumers being stranded at low-quality or inadequately maintained charging infrastructure.

4.1 Please describe AddÉnergie's protocols and response times to emergency and non-emergency customer issues at EV charging stations. Please include specifics that are applicable at AddÉnergie's EV charging stations located in the province of BC.

<u>Response</u>

For its stations in the province of British Columbia AddÉnergie conducts proactive real-time monitoring, offers 24/7 support via telephone for users in both English and French and conducts preventative inspections and maintenance, to ensure we provide market-leading customer experience to our station owners and EV drivers.

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

<u>Response</u>

Some of the main requirements to manufacture public EV charging stations include:

- Having the manufactured product certified by an approved certification agency (CSA, UL, or other) according to each and every applicable CSA standard;
- Having the manufacturing facility listed in the certification report of each manufactured product;
- Having the manufacturing facility successfully pass the random regular audits performed by the applicable certification agency;
- Having the appropriate facility, the appropriately skilled and trained workers (assemblers, electronic technician, manufacturing engineers), the appropriate supply chain, and the appropriate tools to
  - Assemble power electronic equipment, EVSEs and DCFCs;
  - Test power electronic equipment, EVSEs and DCFCs; and
  - Repair power electronic equipment, EVSEs and DCFCs.

Some of the main requirements to install pubic EV charging stations include the following:

- Developing plans for civil works, construction electrical works;
- Obtaining appropriate municipal and regulatory permits and conducting any searches required regarding the installation site, including utility capacity review;
- Having a certified electrician perform any electrical works;
- Obtaining inspection of electrical works;
- Having the newly installed public EV charging station tested (by the electrician) with an appropriate test apparatus (EV or EV simulator), after first power up; and
- Having the newly installed public EV charging station commissioned (by a trained engineer at our Network Operation Center) at the central server level of the Charging Service Provider.

Some steps required in the maintenance of Pubic EV charging stations include:

- Regular and unscheduled maintenance by an appropriately skilled and trained technician, in accordance with the manufacturer specification related to the specific model of charging stations, more specifically:
  - In the case of AC charging stations, a certified electrician has the required skill set to perform any type of maintenance task; and
  - In the case of DCFCs, to maintain or repair anything inside the charger, an electronic technician with a strong knowledge of power electronics is required; and
- Maintaining and repairing anything upstream of the charger, which requires a certified electrician.

4.2.1 Please distinguish any differences between public EV charging stations and home EV charging.

Response

Public charging stations are typically required to be rugged enough to sustain more frequent, heavy use, while incorporating additional features such as access control, locked connectors and real-time data and reporting services which contribute to a seamless user experience for EV drivers. Public chargers should typically incorporate the use of an aluminum enclosure which is more resistant to vandalism, as well as cable management to avoid safety issues associated with cables sitting on the ground where people may walk or equipment may be operating. Finally, a public charger should also incorporate a payment authentication service to enable station owners to recover costs where appropriate. While many home EVSE users seek one or more of these features as well, they tend to be optional for EVSE installed inside a garage.

4.3 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.

Response

AddÉnergie is not aware of any legal minimum requirements of this nature, although they are often required as part of private agreements with the owners of the charging site (sometimes called “site hosts”). At AddÉnergie, we advise our site-host clients to obtain sufficient insurance.

5.0 Reference: Exhibit C4-2-1, pp. 3–6 Future technology

On pages 3-6 of Exhibit C4-2-1, Mr. Flintoff summarises several prospective future technologies that may displace current technologies.

5.1 Please explain AddÉnergie's considerations for changes to battery technology, such as solid- state batteries, when it invests (owns or operates) in DCFC stations.

Response

AddÉnergie closely monitors developments in battery and associated technology including high-capacity and inductive charging options. At present, many of these technologies are still in the R&D phase, meaning that it is not possible to predict with a high degree of certainty which will be deployed on a commercial basis (if any). Because high-capacity, fast-charging batteries are likely to require additional charger capacity, AddÉnergie advises its client site hosts to prepare for technological change by investing in sufficient electrical capacity to accommodate future upgrades to higher charging capacities and follows the same practice on sites it owns and/or leases for its own chargers.

5.2 Please explain AddÉnergie's considerations for changes to high-capacity charging technology, such as 350-450kW charging rates, when it invests (owns or operates) DCFC stations.

Response

AddÉnergie's considerations are similar to those for changes to battery power in response to question 5.1, above. AddÉnergie also considers that, while future models of EVs are likely to support high-capacity charging, many existing vehicles are not able to use these chargers to their full capacity, meaning that existing chargers are still likely to be useful for many existing vehicles in the future.

5.3 Please explain AddÉnergie's considerations for other changes to technology in the EV market when it invests (owns or operates) in DCFC stations.

Response

AddÉnergie attempts to make its technology as future-proof as possible. For example, our networked stations (including DCFCs) are remotely upgradable to allow us to continually update our services and software and we retain ownership of a network communications gateway to enable us to continually update our technology.

6.0 Reference: Exhibit C3-2, p. 2

Open Charge Point Protocol (OCPP)

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

> ...the EVSE 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 [OCPP] 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.

6.0 Please discuss AddÉnergie's view on the benefits and drawbacks of using OCPP.

Response

AddÉnergie strongly believes that customers should have choice in the management of EV charging and discharging infrastructure. Currently, there is no globally accepted standard on this subject, although the International Electrotechnical Commission (IEC) is currently working on a potential standard under 63110, which AddÉnergie believes is likely to become the global standard for the management of EV charging and discharging infrastructure.[1]

In the interim, many companies and organizations, including AddÉnergie, have found it advisable and in the best interest of customers to publish and use open source protocols. In an effort to provide its customers with high-performing and flexible assets, AddÉnergie developed the Open Network Protocol (ONP)-Intranetworking.[2] This protocol is available under the Creative Commons Attribution-NoDerivatives 4.0 International Public License, the same open

[1] A list of International Electro Technical Commission under the TC 69 Electric road vehicles and electric industrial trucks work programme including 63110 can be accessed at http://www.iec.ch/dyn/www/f?p=103:23:8890089465082::::FSP_ORG_ID,FSP_LANG_ID:1255,25

[2] Accessible at https://addenergietechnologies.com/download/9385/

licensing terms that have been used to publish other EV-charging management protocols, such as the Open Charge Point Protocol (OCPP).

The ONP-Intranetworking Protocol allows all AddÉnergie-manufactured charging stations to be managed from the company's Charging Station Network Management System (CSNMS). The protocol also allows third party network management systems with appropriate security permissions to obtain full control of AddÉnergie charging stations, and it allows network operators to develop a control interface to manage third party charging stations from AddÉnergie's CSNMS.

While AddÉnergie is not opposed to OCPP, our experience suggests that the commonly used versions (1.5 and 1.6) lack some key features required to fully manage a large quantity of networked charging stations including management of faults, configuration, accounting and billing, performance management and security. As a result, OCPP-based chargers are typically deployed with customized extensions to the protocol, which are necessary to fill the gaps. Our understanding is that the versions also lack backward compatibility with one another, and that the upgrade of a charging station using an earlier version to a newer version is typically challenging to do remotely, creating meaningful barriers when it comes to maintaining and evolving a large scale network.

AddÉnergie also has experienced taking over charging stations designed to operate both with and without OCPP in situations where other charging networks have ceased operations in a particular area and AddÉnergie was chosen to take over station management. Our experience suggests that controlling charging and discharging functions (covered by OCPP and the ONP-Intranetworking Protocol) is one of the least complicated elements of a transition. Far more expensive and time consuming is the transition of customer data and billing/payment information in a manner that is accurate and complies with applicable law (including privacy and user agreements). These issues are not covered by OCPP.

C. RATES

7.0 Reference: Exhibit C1-2, p. 13

Rate design – charging station to EV customer

On page 13 of Exhibit C1-2, British Columbia Hydro and Power Authority (BC Hydro) states: "It may be possible to differentiate time-based charges to vary based on vehicle capacity to address such fairness issues."

7.1 What is AddÉnergie's view on alternative rate structures, such as BC Hydro's suggestion to differentiate time-based charges to vary based on vehicle capacity?

Response

BC Hydro's suggestion to differentiate time-based charges based on vehicle capacity is technically possible. It should be noted, however, that if the rate charged varies depending on vehicle capacity (power drawn), AddÉnergie's understanding is that Measurement Canada would still need to be involved in creating a certification standard for the station.

AddÉnergie submits that the Commission may also wish to consider that, (1) in the case of DCFC public charging, the major user complaint as use increases tends to relate delays waiting for other users to vacate a charging space and (2) that commodity electricity costs tend to be relatively small portion of overall station costs compared to the costs of building, maintaining and operating a DCFC public charging station, all of which costs have limited or no relationship to vehicle charging capacity. Any rate charged to consumers should, therefore, take into account incentives to vacate stations and costs that do not change based on vehicle capacity, as well as any vehicle capacity-based charges (assuming such are permitted).

7.2 Please explain whether AddÉnergie systems would be able to differentiate EV charging rates based on vehicle capacity.

Response

AddÉnergie's technologies are able to differentiate EV charging rates based on a number of vehicle capacity metrics including state of charge variation and also power drawn during charging.

8.0 Reference: Exhibit C20-2, p. 7 Exhibit C1-2, p. 7

Measurement Canada

On page 7 of Exhibit C20-2, AddÉnergie states: "that as of March 6, 2018, Measurement Canada has not certified any commercially available DCFC device to bill on the basis of energy (kWh) or time-related demand (kW)."

On page 7 of Exhibit C1-2, BC Hydro states:

The introduction of a new standard is expected to take some time, and in BC Hydro's view a Measurement Canada approved DC standard is several years away.

8.1 Has AddÉnergie sought Measurement Canada certification for DCFC devices it manufactures or imports in order for owners or operators to bill an energy-based rate?

<u>Response</u>

AddÉnergie regularly engages with Measurement Canada and is not aware of a certification process suitable for currently available DCFC. AddÉnergie will continue to engage with Measurement Canada on this point.

8.1.1 If so, please provide a status update on such processes.

<u>Response</u>

Not applicable.

8.1.2 If not, does AddÉnergie have any plans to file a request in the future?

<u>Response</u>

We do not have plans to file immediately because we are not aware of a process appropriate for DCFC and has plans to file if a certification process is developed. In the meantime, AddÉnergie will continue to engage with Measurement Canada on an ongoing basis regarding development of an appropriate certification process.

8.2 Please explain what difficulties exist in certifying DCFC billing devices for commercial use purposes. Is it unique to EV charging stations?

Response

The existing standards are tailored toward AC meters and are not readily applicable to embedded measurement devices for DC billing devices. The DC system is not a separate meter, whereas an AC meter is tamper-proof and contained in a separate system. The DC system is a chip set on the circuit board that does more than measure power.

Additionally, the AC-meter certification process is subject to a stringent calibration check to ensure there is no deviation from the initial manufacturing conditions over the lifespan of the system. To apply the same system to DCFC will bring a substantial increase in operational costs that is likely to render the economics of DCFC even less favourable.

8.2.1 Are AC Level 2 chargers certified by Measurement Canada to charge by energy?

Response

AddÉnergie is not aware of any AC Level 2 chargers certified by Measurement Canada to charge by energy at this time.

D. HYDROGEN FUEL CELL TECHNOLOGY

9.0 Reference: Exhibit C20-2, p. 2; Exhibit C19-2, p. 2 Fuel Cell Electric Vehicle (FCEV)

On page 2 of Exhibit C20-2, AddÉnergie states:

AddÉnergie Technologies Inc. (AddÉnergie) was founded in 2009 and is a North American leader in electric vehicle (EV) charging solutions with operations in British Columbia, Québec, Ontario and California. AddÉnergie delivers an average of over 100,000 charging sessions per month, including 10,000 fast charging sessions, and has manufactured over 4,500 charging stations, including 150 fast chargers. AddÉnergie owns and operates FLO, which we understand to be Canada's largest EV charging network, and which has more than 30,000 users.

On page 2 of Exhibit C19-2, British Columbia Ministry of Energy, Mines and Petroleum Resources 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."

9.1 Please discuss whether AddÉnergie has any involvement in FCEVs and/or FCEV fueling infrastructure.

Response

AddÉnergie does not currently have any involvement in FCEVs and/or FCEV fueling infrastructure.