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May 17, 2021

Mr. Patrick Wruck
Commission Secretary and Manager
Regulatory Support
British Columbia Utilities Commission
Suite 410, 900 Howe Street
Vancouver, BC V6Z 2N3

Dear Mr. Wruck:

RE: Project No. 1599190
British Columbia Utilities Commission (BCUC or Commission)
British Columbia Hydro and Power Authority (BC Hydro)
Public Electric Vehicle Fast Charging Rate Application

BC Hydro writes in compliance with Commission Order No. G-89-21 to provide its responses to Round 1 information requests as follows:

Exhibit B-4	Responses to Commission IRs (Public Version)
Exhibit B-4-1	Responses to Commission IRs (Confidential Version)
Exhibit B-5	Responses to Interveners IRs
Exhibit B-5-1	Responses to Interveners IRs (Confidential Version)
Exhibit B-1-1	Erratum No. 1 to the Application filed on March 5, 2021

BC Hydro is filing a number of IR responses and/or attachments to responses confidentially with the Commission. BC Hydro confirms that in each instance, an explanation for the request for confidential treatment is provided in the public version of the IR response. BC Hydro seeks this confidential treatment pursuant to section 42 of the *Administrative Tribunals Act* and Part 4 of the Commission's Rules of Practice and Procedure.

In addition, BC Hydro has discovered a typographic error on page 32 of the Application. The enclosed Erratum No. 1 outlines the correction to the Application.

For further information, please contact Anthea Jubb at 604-623-3545 or by email at bchydroregulatorygroup@bchydro.com.

Yours sincerely,

Chris Sandve
Chief Regulatory Officer

ms/tl

Enclosure

1.0 A. REGULATORY CONTEXT AND BACKGROUND

Reference: INTRODUCTION
Exhibit B-1 (Application), Section 1.3.1, pp. 5–6, Section 4.1, p. 25
Separate Class of Service

On page 5 of the Application, British Columbia Hydro and Power Authority (BC Hydro) provides the findings from the British Columbia Utilities Commission's (BCUC) Phase 2 Electric Vehicle (EV) Inquiry that it considered in the design of the proposed EV fast charging service rates. One of the BCUC findings considered includes:

> 3. Non-exempt public utilities should develop a separate rate and tariff (or a separate class of service) for any operators utilizing any level of charging, other than Level 1 or 2.

On page 6 of the Application, BC Hydro states:

> Third, the Proposed Rates[1] are separate from other BC Hydro rates and services, allowing BC Hydro to collect data, review and recommend any changes to the Proposed Rates in an evaluation to be completed in fiscal 2024…

On page 25 of the Application, BC Hydro states:

The proposed RS 1360, which is applicable to public fast charging service at 25 kW stations, is considered a Small General Service (SGS) rate and is proposed at 12 cents per minute; RS 1560, which is applicable to public fast charging service at 50 kW stations, is considered a Medium General Service rate (MGS) and is proposed at 21 cents per minute, and RS 1561, which is applicable to public fast charging service at 100 kW stations, is also considered an MGS rate and proposed at 27 cents per minute.

1.1.1 Please explain why BC Hydro does not propose creating a separate class of service for its EV fast charging service that are provided from stations that are prescribed undertakings and is instead proposing these Direct Current Fast Chargers (DCFCs) as a subset of the general service rate

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[1] Proposed Rates mean BC Hydro's proposed three new Rate Schedules (RS) 1360 ($0.12/minute at 25 kW charging stations), 1560 ($0.21/minute at 50 kW charging stations) and 1561 ($0.27/minute at 100 kW charging stations).

RESPONSE:

BC Hydro interprets the "separate class of service" in the question to mean a "distinct class of service as a self-contained unit" as used in section 60(1) (c) of the *Utilities Commission Act*. BC Hydro applies this concept to the BCUC approved rate classes defined for the purpose of our Fully Allocated Cost of Service Studies. (For the purposes of responding to those questions, the term "class of service" is used interchangeably with the term "rate class").

BC Hydro notes that we do not need to create a new rate class to undertake cost of service and ratepayer economic impact analysis for a service. As described in section 5 of the Application, BC Hydro will undertake such analysis for public fast charging service. The creation of three new rate schedules for the public fast charging service facilitates this analysis and ensures that revenues and costs can be separately tracked.

We also note that the creation of new rate schedules within an existing rate class, and the subsequent analysis of the cost and ratepayer economic impacts for the service under the new rate schedule, is common for BC Hydro. Two recent examples are our Freshet Energy Rate Schedule 1892, which is part of the Transmission Service Rate Class, and our Fleet Electrification Demand Transition Rate Schedules 1650, 1651, 1652 and 1653, which are part of the Large General Service Rate Class.

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> 3. Non-exempt public utilities should develop a separate rate and tariff (or a separate class of service) for any operators utilizing any level of charging, other than Level 1 or 2.

On page 6 of the Application, BC Hydro states:

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1.1.2 Please discuss whether there are any legislated restrictions for the BCUC to direct BC Hydro's EV fast charging stations that meet the definition of a prescribed undertaking to be placed into a separate class of service.

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RESPONSE:

Under the *Utilities Commission Act*, the BCUC has considerable discretion to determine classes of service, or classes of customer, for rate-setting purposes. Generally, classes of service, or customer, are established when usage characteristics are similar enough within a class to infer a reasonably similar cost of service between members of the class, bearing in mind that a utility's tariff and other administration costs are proportionate to the number of classes.

In the case of the Proposed Rates for the electric vehicle fast charging service, BC Hydro does not see that establishing it as a separate class of service would serve any material purpose at this time, and so would not support its establishment as discussed in BC Hydro's responses to BCUC IRs 1.1.1 and 1.1.3.1.

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1.1.3 Please discuss BC Hydro's last Cost of Service Allocation (COSA) study, and the implications it may have on its proposal for EV fast charging stations to be a new subset of the existing general service class of customers.

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RESPONSE:

BC Hydro's most recent Fully Allocated Cost of Service Study was filed with the BCUC on February 11, 2021 and is publicly available at the following location:

https://www.bchydro.com/content/dam/BCHydro/customer-portal/documents/corporate/regulatory-planning-documents/regulatory-filings/facos/00-2021-02-11-bchydro-facos-f2020.pdf

As shown in the Study, BC Hydro currently has eight approved rate classes for the purpose of our Fully Allocated Cost of Service Studies: Residential Service, Small General Service, Medium General Service, Large General Service, Irrigation, Street Lighting Customer Owned, Street Lighting BC Hydro Owned, and Transmission. Rate class may be comprised of services under a number of individual rate schedules. For example, there are eight rate schedules in the Residential Service rate class.

In future Fully Allocated Cost of Service Studies, Rate Schedule 1360 Public Fast Charging Service 25 KW will be included in the analysis of the Small General Service rate class, and Rate Schedules 1560 and 1561 for Public Fast Charging Service at 50 kW and 100 kW respectively will be included in the analysis of the Medium General Service rate class.

At this time, BC Hydro does not anticipate any material implications by including RS 1360, RS 1560 and RS 1561 in our Fully Allocated Cost of Service Study, because the potential revenue and cost associated from these services are negligible compared to the revenue and costs of the rate classes of which they are part.

The Fiscal 2022 revenue for fast charging services is estimated to be approximately $0.6 million based on the assumed station utilization and the Proposed Rate in the Application. In contrast, the annual revenue from the Medium General Service rate class of which Rate Schedule 1560 will be part for the purposes of the Fully Allocated Cost of Service Study was $394 million in fiscal 2020. The fast charging service under Rate Schedule 1560 will represent less than 0.16 per cent.

BC Hydro anticipates that station utilization, revenues and cost will grow over time. We have thus proposed the monitoring and evaluation plan shown in section 5, page 36 of the Application:

> **the evaluation will include collection of data on the electricity use characteristics (e.g., load profile, load factor, and peak demand) of the fast charging service and determination of whether General Service remains appropriate or a new rate class should be developed specific to electric vehicle fast charging service.**

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> 3. Non-exempt public utilities should develop a separate rate and tariff (or a separate class of service) for any operators utilizing any level of charging, other than Level 1 or 2.

On page 6 of the Application, BC Hydro states:

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1.1.3.1 Please discuss the pros and cons of placing the EV fast charging stations that meet the definition of a prescribed undertaking into a separate class of service. What are the implications to the customers of all the different BC Hydro's rate classes?

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[1] Proposed Rates mean BC Hydro's proposed three new Rate Schedules (RS) 1360 ($0.12/minute at 25 kW charging stations), 1560 ($0.21/minute at 50 kW charging stations) and 1561 ($0.27/minute at 100 kW charging stations).

RESPONSE:

For the reasons described in BC Hydro's response to BCUC IRs 1.1.1 and 1.1.3, there would be no implications to any BC Hydro customer of placing the EV fast charging stations in a separate class of service for the purpose of our Fully Allocated Cost of Service Studies.

BC Hydro does not support the creation of a new rate class at this time. The creation of a new rate class requires a cost of service justification, and the appropriate cost studies have not and cannot be completed at this time. The service is still new and has been offered free of charge up until recently. Usage and load characteristics, which are key determinants in cost of service analysis, will change with the introduction of the rate as proposed in this Application. The completion of a reliable cost of service analysis needs to consider data collected after a rate is approved and introduced.

The appropriate time to consider whether or not the creation of a new rate class is justified is upon the completion of the evaluation proposed in section 5 of the Application, the scope of which will include consideration of whether a new rate class should be developed.

2.0 A. REGULATORY CONTEXT AND BACKGROUND

Reference: INTRODUCTION
Exhibit B-1, Section 1.3.2, pp. 6–7, Section 4.1, p. 25;
BC Hydro Fiscal 2022 Revenue Requirements Application (F2022 RRA), Exhibit B-2, Section 1.4.1, p. 1–17
Deferral account mechanism

On pages 6 to 7 of the Application, BC Hydro states:

> In the F2022 RRA, BC Hydro is seeking approval to establish [an Electric Vehicle Costs] regulatory account to defer any actual operating and maintenance costs, amortization, and cost of energy amounts with respect to the electric vehicle charging stations for fiscal 2020, and fiscal 2021 that meet the definition of a prescribed undertaking under section 5 of the GGRR. Fiscal 2022 costs related to prescribed undertakings are also included in the F2022 RRA [Revenue Requirement Application]... [sic] [footnotes removed]
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> In the F2022 RRA BC Hydro did not forecast any revenues from service related to electric vehicle stations because BC Hydro has no approved rates for providing the service. Only costs are included in BC Hydro's F2022 RRA. Accordingly, there were no revenue amounts recorded in the Electric Vehicle Costs Regulatory Account for fiscal 2020 and fiscal 2021.
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> Any revenues collected under the Proposed Rates for public electric vehicle fast charging service will be captured in BC Hydro's Cost of Energy Variance Accounts, (to the extent that they contribute to an overall variance compared to planned revenues in the year), such that ratepayers will get the benefit of these revenues in future periods.

1.2.1 In light of the Greenhouse Gas Reduction Regulation (GGRR), please discuss whether BC Hydro views that the BCUC can direct that the F2022 revenues collected for public EV fast charging service be captured in a regulatory account other than BC Hydro's Cost of Energy Variance Accounts. Why or why not?

RESPONSE:

Whether a regulatory account other than BC Hydro's Cost of Energy Variance Accounts can be used depends on the purposes of the regulatory account.

If the regulatory account is established to defer or delay the cost recovery to future periods (i.e., not allow to recover the forecast costs in each fiscal year,

which results in a revenue deficiency), this would be inconsistent with section 18(2) of the *Clean Energy Act*, which requires the BCUC to set rates that allow a public utility "to collect sufficient revenue in each fiscal year to enable it to recover its costs incurred with respect to" electric vehicle fast charging stations that meet the requirements of section 5 of the GGRR.

In contrast, if the regulatory account is to capture the differences between the forecast and actual revenues or costs (like BC Hydro's Cost of Energy Variance Accounts), it will not conflict with section 18(2) of the *Clean Energy Act*, as BC Hydro would still recover its forecast costs in each year and the regulatory account would simply ensure that ratepayers pay the actual costs.

In other words, section 18(2) is satisfied if BC Hydro is able to recover its forecast costs in a year. A regulatory account that prevents this would not be consistent with section 18(2).

Please refer to BC Hydro's response to BCUC IR 1.2.2 where BC Hydro explains why using the Cost of Energy Variance Accounts is appropriate.

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1.2.2 Please discuss the pros and cons of capturing the F2022 revenues collected for public EV fast charging service in the Cost of Energy Variance Accounts.

RESPONSE:

BC Hydro interprets the question as asking about the pros and cons of using the Cost of Energy Variance Accounts in fiscal 2022 <u>instead of some other regulatory account</u> (e.g., the Electric Vehicle Costs Regulatory Account). We assume the question is not asking for the pros and cons of deferring these variances versus not deferring them at all, since in the latter case the revenues would be to the account of the shareholder. Deferring the revenues is equitable in that it ensures

that ratepayers (who paid for the costs of the EV charging stations) benefit from the revenues received.

The pros and cons of capturing the Fiscal 2022 revenues collected for public EV fast charging service in the Cost of Energy Variance Accounts (specifically, the Load Variance Regulatory Account) are as follows:

Pros:

- **Consistency with deferral of load variances to the Load Variance Regulatory Account. Deferral to a different account would create administrative burden to separate this variance, and would create additional complexity and potentially confusion in the financial schedules; and**
- **Consistent recovery / refund mechanism for ratepayers. The recovery mechanism for the Cost of Energy Variance Accounts, the Deferral Account Rate Rider (DARR), minimizes intergenerational inequality by being responsive to the changing net balance in the Cost of Energy Variance Accounts, maintains rate stability for customers to the extent practicable, and is administratively simple and transparent.**

Cons:

- **Though consistent with the recovery mechanism for the Cost of Energy Variance Accounts, the refund through the DARR will often be over a period four-six years, which is different from the recovery in the following test period that is common for many variance deferral accounts; and**
- **The EV revenue variance amount deferred is combined with other load variances in the Load Variance Regulatory Account. BC Hydro notes that it will be able to report on this particular variance even if it resides in the Load Variance Regulatory Account. The revenues in question are relatively small. The Fiscal 2022 revenue is estimated to be approximately $0.6 million based on the assumed station utilization and the Proposed Rate in the Application. Thus, BC Hydro considers the costs of so doing (e.g., the administrative burden of separating this variance into another regulatory account and the resulting additional complexity in the financial schedules) to outweigh any benefits.**

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1.2.3 Please discuss the impact to BC Hydro's EV fast charging customers and its non-EV fast charging customers of capturing the F2022 revenues collected for public EV fast charging service in the Electric Vehicle Costs Regulatory Account proposed in the BC Hydro RRA instead of the Cost of Energy Variance Accounts.

RESPONSE:

There is no impact on EV fast charging customers of capturing the fiscal 2022 revenue variances in the Electric Vehicle Costs Regulatory Account instead of the Cost of Energy Variance accounts because the refund of variances in either account is applied to all ratepayers in future revenue requirements applications. EV fast charging customers will be charged rates approved by the BCUC. Both regulatory accounts will refund the revenue variances to the same ratepayers that

incurred the costs as the EV charging station costs for fiscal 2022 were included in the Fiscal 2022 Revenue Requirements Application (F2022 RRA).

As described in BC Hydro's response to BCUC IR 1.2.2, the recovery period for the Electric Vehicle Costs Regulatory Account could be shorter than the recovery period for the Cost of Energy Variance Accounts, so customers would receive any refund sooner if the revenue variance was deferred to the Electric Vehicle Costs Regulatory Account. However, capturing fiscal 2022 revenues collected from the public EV fast charging service in the Electric Vehicle Costs Regulatory Account would not be consistent with the existing regulatory framework, because:

- **The Load Variance Regulatory Account captures variances between forecast and actual domestic customer load. No EV fast charging service revenues were forecast in fiscal 2022; therefore, all revenues collected in fiscal 2022 will result in a variance from forecast, which meets the definition of what is captured in the Load Variance Regulatory Account; and**
- **The amounts recorded to the Electric Vehicle Costs Regulatory Account are for fiscal 2020 and fiscal 2021 total costs, including operating costs, amortization and cost of energy for electric vehicle charging stations that are prescribed undertakings. Revenues collected in fiscal 2022 do not meet the definition for the existing scope of Electric Vehicle Cost Regulatory Account.**

Furthermore, capturing F2022 revenues collected for public EV fast charging service in the Electric Vehicle Costs Regulatory Account would delay BC Hydro's ability to close the Electric Vehicle Costs Regulatory Account. In the Fiscal 2022 RRA (specifically, in BC Hydro's response to BCUC IR 1.1.2 in that proceeding), BC Hydro noted that it would propose to close the account once the balance in the account is fully recovered. This would not be possible in fiscal 2022 because it expects that there may be a balance remaining in the account as a result of variances between the actual costs and the forecasts costs that are included in the fiscal 2022 recovery. BC Hydro expects that it would be possible to close the account in the upcoming Fiscal 2023 to Fiscal 2025 RRA, but that this would not be possible if the fiscal 2022 revenue variance was deferred to the account. That's because the actual fiscal 2022 revenue variance will not be known until after fiscal 2022 ends. The Fiscal 2023 to Fiscal 2025 RRA will be based on forecasts before fiscal 2022 ends, and thus there will be a difference between actual fiscal 2022 amounts, and the forecast in the Fiscal 2023 to Fiscal 2025 RRA. Thus, the amounts amortized from the account based on the forecast will result in a balance remaining at the end of the Fiscal 2023 to Fiscal 2025 RRA test period, which would need to be recovered in the subsequent test period.

Also as discussed in BC Hydro's response to BCUC IR 1.2.2, BC Hydro considers that given the relatively small amount of revenues in question, the administrative burden and additional complexity in the financial schedules from deferring the fiscal 2022 revenues to the Electric Vehicle Costs Regulatory Account outweigh any benefits.

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1.2.4 In light of the GGRR, please discuss whether BC Hydro views that the BCUC can direct BC Hydro to amortize the balance in the Electric Vehicle Costs Regulatory Account only to its EV fast charging customers for recovery or refund. Why or why not?

RESPONSE:

While section 18(2) of the *Clean Energy Act* requires that the BCUC allow a public utility "to collect sufficient revenue in each fiscal year to enable it to recover its costs incurred with respect to" electric vehicle fast charging stations that meet the requirements of section 5 of the GGRR, it does not specify from whom or by what means the revenues are collected and the costs are recovered. Thus, the costs can be recovered, and the revenue can be collected, from non-electric

vehicle fast charging service customers as well as the electric vehicle fast charging service customers.

However, if the BCUC were to direct the recovery of the Electric Vehicle Costs Regulatory Account balance to be recovered from the customers of electric vehicle fast charging service only, it must ensure that the requirement of section 18(2) of the *Clean Energy Act* is met each fiscal year. That is, BC Hydro collects sufficient revenue in each fiscal year to enable it to recover its costs incurred with respect to its electric vehicle fast charging stations.

As explained in the Application, over the near-term, BC Hydro cannot collect sufficient revenue from the customers of electric vehicle fast charging service customers under the Proposed Rates for full cost recovery in a fiscal year. Thus, any difference between the revenue and costs in any given year will be to the debit of all ratepayers (i.e., non-electric vehicle fast charging service customers), addressed through the revenue requirements proceedings.

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1.2.4.1 Please discuss the impact to BC Hydro's EV fast charging customers and to its non-EV fast charging customers of amortizing the balance in the Electric Vehicle Costs Regulatory Account only to its EV fast charging customers for recovery or refund.

RESPONSE:

Amortization of the forecast balance of the Electric Vehicle Costs Regulatory Account is already included in the Fiscal 2022 Revenue Requirements Application. Removing this amortization and instead recovering it from fast charging service customers would have a small impact (we estimate that the fiscal 2022 rate increase would be lower by less than 0.1 per cent) on fiscal 2022 rates.

As discussed in section 4 of the Application, the Proposed Rates will not recover the full cost of service for the fast charging service because station utilization is expected to be low at 3 per cent to 5 per cent. Setting an even higher rate to enable recovery of the amortization of the Electric Vehicle Costs Regulatory Account only from the fast charging service customers would likely further reduce utilization and erode revenue. Assuming a 5 per cent utilization rate and an average of 126 stations in-service during fiscal 2022, the fiscal 2022 revenue is expected to be approximately $0.6 million, which is significantly lower than the fiscal 2022 amortization of the Electric Vehicle Costs Regulatory Account of $4.9 million. Therefore, recovery of the regulatory account balance only from those customers is unlikely.

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> In the F2022 RRA BC Hydro did not forecast any revenues from service related to electric vehicle stations because BC Hydro has no approved rates for providing the service. Only costs are included in BC Hydro's F2022 RRA. Accordingly, there were no revenue amounts recorded in the Electric Vehicle Costs Regulatory Account for fiscal 2020 and fiscal 2021.
>
> Any revenues collected under the Proposed Rates for public electric vehicle fast charging service will be captured in BC Hydro's Cost of Energy Variance Accounts, (to the extent that they contribute to an overall variance compared to planned revenues in the year), such that ratepayers will get the benefit of these revenues in future periods.

1.2.4.2 In a scenario where BC Hydro is directed to amortize the balance in the Electric Vehicle Costs Regulatory Account only to its EV fast charging customers for recovery or refund, please discuss how BC Hydro would enable this requirement. Would a rate rider be used?

RESPONSE

As noted in BC Hydro's response to BCUC IR 1.2.4.1, the forecast amortization of the Electric Vehicle Costs Regulatory Account in fiscal 2022 is $4.9 million. This is included in BC Hydro's requested rates for fiscal 2022 as part of the Fiscal 2022 Revenue Requirements Application, a decision related to which is pending and expected soon.

If the hypothetical scenario in the question occurs, BC Hydro considers that the following steps may be required:

- **Depending on the nature and timing of the BCUC decision related to the Fiscal 2022 Revenue Requirements Application, fiscal 2022 rates may have already been set on a final basis and hence BC Hydro is unsure how BCUC would envision that ratepayers would receive the benefit of the lower amortization related to the Electric Vehicle Costs Regulatory Account if that $4.9 million is instead directed to be recovered only from EV fast charging customers. That's because the fiscal 2022 rates will recover that amount from ratepayers;**

- **One possibility referenced in the question would be to charge a rate rider applicable only to those rate schedules for electric vehicle fast charging services until such time the variance is zero. Specifically, the rate rider would need to be in place until such time as it collected the $4.9 million mentioned above;**

- **To manage administrative costs and complexity, BC Hydro's preference would be to have the revenues resulting from the rate rider be deferred to the Load Variance Regulatory Account. This would occur in the normal course under the existing regulatory framework. BC Hydro would track and report on the revenues generated by the rate rider. In other words, the rate rider revenues that would be collected from electric vehicle fast charging service customers would be placed into this account and would be returned to ratepayers over time using the mechanism for recovery/refund of the balance in the Cost of Energy Variance Accounts (i.e., the Deferral Account Rate Rider). This would provide the benefit to ratepayers of the $4.9 million to offset the fact that they may have already paid this amount in fiscal 2022 rates.**

As noted in BC Hydro's response to BCUC IR 1.2.4.1, the revenue expected from EV fast charging services in fiscal 2022 is estimated to be approximately $0.6 million. Using a rate rider to collect another $4.9 million (even if done over a number of years) would represent a very significant increase in the effective rates for EV fast charging services. BC Hydro notes that this would likely result in even lower station utilization (and thus even lower revenues).

2.0 A. REGULATORY CONTEXT AND BACKGROUND

Reference: INTRODUCTION
Exhibit B-1, Section 1.3.2, pp. 6–7, Section 4.1, p. 25;
BC Hydro Fiscal 2022 Revenue Requirements Application (F2022 RRA), Exhibit B-2, Section 1.4.1, p. 1–17
Deferral account mechanism

Section 18(2) of the *Clean Energy Act* (CEA) states:

> In setting rates under the *Utilities Commission Act* for a public utility carrying out a prescribed undertaking, the commission must set rates that allow the public utility to collect sufficient revenue in each fiscal year to enable it to recover its costs incurred with respect to the prescribed undertaking.

1.2.5 In light of section 18(2) of the CEA, please discuss whether BC Hydro views that the BCUC can direct the establishment of a regulatory account to capture the revenue and costs with respect to BC Hydro's EV fast charging service, and amortize the net balance into the rates of BC Hydro's EV fast charging customers. Why or why not?

RESPONSE:

Please refer to BC Hydro's response to BCUC IR 1.2.1 where BC Hydro explains that a regulatory account for the purposes of delaying or deferring cost recovery to a future period (i.e., not allow to recover the forecast costs in each fiscal year, which results in a revenue deficiency) would not be consistent with section 18(2) of the *Clean Energy Act*.

Please also refer to BC Hydro's response to BCUC IR 1.2.4 where BC Hydro explains that recovering the balance of a regulatory account only from customers of electric vehicle fast charging service is allowable under section 18(2) of the *Clean Energy Act*, but the BCUC must ensure that BC Hydro collects sufficient revenue in each fiscal year to enable it to recover in rates its remaining costs incurred with respect to its electric vehicle fast charging stations.

2.0 A. REGULATORY CONTEXT AND BACKGROUND

Reference: INTRODUCTION
Exhibit B-1, Section 1.3.2, pp. 6–7, Section 4.1, p. 25;
BC Hydro Fiscal 2022 Revenue Requirements Application (F2022 RRA), Exhibit B-2, Section 1.4.1, p. 1–17
Deferral account mechanism

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1.2.5 In light of section 18(2) of the CEA, please discuss whether BC Hydro views that the BCUC can direct the establishment of a regulatory account to capture the revenue and costs with respect to BC Hydro's EV fast charging service, and amortize the net balance into the rates of BC Hydro's EV fast charging customers. Why or why not?

1.2.5.1 Please discuss whether the regulatory account mechanism described in the preceding information request (IR) would minimize potential cross-subsidization between BC Hydro's EV fast charging customers and its non-EV fast charging customers.

RESPONSE:

As described in BC Hydro's response to BCUC IR 1.2.1, understanding the purposes of a regulatory account is critical for determining whether the regulatory account would be consistent with section 18 of the *Clean Energy Act*.

For the purposes of responding to this question, BC Hydro assumes that the regulatory account mechanism described in BCUC IR 1.2.5 is intended to recover fast charging station service costs incurred in one fiscal year solely from future customers of the fast charging station service in subsequent fiscal periods (i.e., to create a revenue deficiency regulatory account for future recovery). Such a regulatory account would not be consistent with section 18 of the *Clean Energy Act* as explained in BC Hydro's response to BCUC IR 1.2.1.

Even if this regulatory account approach could be used (which we don't believe it could), for the reasons described below, BC Hydro is unable to conclusively determine whether or when this approach would be effective in minimizing cross-subsidization of the public fast charging service by all ratepayers.

In order to minimize cross subsidization using the deferral account approach as understood by BC Hydro, the BCUC would need to set a rate that allows future revenues from the fast charging service to be sufficient to recover both cost of service in a specific future fiscal year, as well as any variances from prior year or years (if the current rate is not high enough to collect the sufficient revenues to recover the cost of service in that fiscal year).

Achievement of this level of revenue would require either increased utilization and / or increased rates. As shown on page 31 of the Application, a rate that could recover both cost of service in a specific year as well as any variances from prior year(s) would require an average station utilization well above 20 per cent. BC Hydro does not believe that this level of utilization is probable over the short term.

Increasing rates as an alternative approach to generating sufficient revenue may not be successful, either. As demonstrated on page 15 of the Application, the customer research indicates that a significant portion of fast charging station customers may respond to increasing rates by reducing their use of the stations, which would correspondingly reduce revenues from the fast charging service.

2.0 A. REGULATORY CONTEXT AND BACKGROUND

Reference: INTRODUCTION
Exhibit B-1, Section 1.3.2, pp. 6–7, Section 4.1, p. 25;
BC Hydro Fiscal 2022 Revenue Requirements Application (F2022 RRA), Exhibit B-2, Section 1.4.1, p. 1–17
Deferral account mechanism

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> In setting rates under the *Utilities Commission Act* for a public utility carrying out a prescribed undertaking, the commission must set rates that allow the public utility to collect sufficient revenue in each fiscal year to enable it to recover its costs incurred with respect to the prescribed undertaking.

1.2.5 In light of section 18(2) of the CEA, please discuss whether BC Hydro views that the BCUC can direct the establishment of a regulatory account to capture the revenue and costs with respect to BC Hydro's EV fast charging service, and amortize the net balance into the rates of BC Hydro's EV fast charging customers. Why or why not?

1.2.5.2 Irrespective of section 18(2) of the Clean Energy Act, please discuss whether there are other factors that could prohibit the implementation of the regulatory account mechanism described in IR 2.5.

RESPONSE:

As described in BC Hydro's response to BCUC IR 1.2.5.1, even if this regulatory account approach could be used (which we don't believe it could), the following factors will make this approach non-workable at least in the short term:

- **Such a regulatory account would likely require significantly higher rates or increased station utilization to be well above 20 per cent. Further details on the magnitude of costs involved can be seen in BC Hydro's responses to BCUC IRs 1.2.4.1 and 1.2.4.2. Further, as demonstrated on page 15 of the Application, the customer research indicates that a significant portion of fast charging station customers may respond to increasing rates by reducing their use of the stations, which would correspondingly reduce revenues from the fast charging service. BC Hydro also does not believe that a level of utilization above 20 per cent is probable over the short term;**

- **BC Hydro is unable to conclusively determine whether or when this approach would be effective in recovering costs from EV fast charging service customers; and**
- **The creation of a new regulatory account to capture the revenue and costs with respect to EV fast charging would also increase administration and complexity.**

2.0 A. REGULATORY CONTEXT AND BACKGROUND

Reference: INTRODUCTION
Exhibit B-1, Section 1.3.2, pp. 6–7, Section 4.1, p. 25;
BC Hydro Fiscal 2022 Revenue Requirements Application (F2022 RRA), Exhibit B-2, Section 1.4.1, p. 1–17
Deferral account mechanism

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> In setting rates under the *Utilities Commission Act* for a public utility carrying out a prescribed undertaking, the commission must set rates that allow the public utility to collect sufficient revenue in each fiscal year to enable it to recover its costs incurred with respect to the prescribed undertaking.

1.2.6 Please discuss whether BC Hydro has the ability to track the revenue and costs with respect to BC Hydro's EV fast charging service and any amounts cross-subsidized by BC Hydro's non-EV fast charging customers. If not, please explain why not.

RESPONSE:

BC Hydro has the ability to track and collect the data and conduct the analysis of revenue collected and costs for the fast charging service. We can include this analysis in the evaluation report described in section 5 of the Application, which we propose to file with the BCUC by March 31, 2024.

The completion of cost of service and cross subsidization analysis is a resource and data intensive task requiring at least eighteen months of lead time for data collection and several months of dedicated specialist staff time. For this reason, ongoing tracking and reporting of cross subsidization is not practical, and the analysis should be planned in advanced and conducted at a set date in future, as proposed in our evaluation described in section 5 of the Application.

2.0 A. REGULATORY CONTEXT AND BACKGROUND

Reference: INTRODUCTION
Exhibit B-1, Section 1.3.2, pp. 6–7, Section 4.1, p. 25;
BC Hydro Fiscal 2022 Revenue Requirements Application (F2022 RRA), Exhibit B-2, Section 1.4.1, p. 1–17
Deferral account mechanism

In the BC Hydro Fiscal 2022 Revenue Requirements Application (F2022 RRA) that is currently before the BCUC, BC Hydro is requesting approval of a general rate increase of 1.16 percent, effective April 1, 2021.

In the Application, BC Hydro is requesting approval of rates, effective May 1, 2021, to provide EV fast charging service.

1.2.7 Please confirm, or explain otherwise, that the general rate increase of 1.16 percent requested in the F2022 RRA has already been incorporated into the EV fast charging rates proposed in the Application.

RESPONSE:

The Proposed Rates are designed to collect sufficient revenue to recover at least the cost of electricity based on BC Hydro's General Service rate schedules and as such they reflect the general rate increase of 1.16 per cent as set out in BC Hydro's fiscal 2022 rates as shown in Fiscal 2022 Revenue Requirements Application Appendix Y (page 6) and approved on an interim basis by BCUC Order No. G-1-21: https://www.bcuc.com/Documents/Proceedings/2020/DOC_60301_B-2-2-BCH-F22-RRA-Appendices-Public.pdf.

2.0 A. REGULATORY CONTEXT AND BACKGROUND

Reference: INTRODUCTION
Exhibit B-1, Section 1.3.2, pp. 6–7, Section 4.1, p. 25;
BC Hydro Fiscal 2022 Revenue Requirements Application (F2022 RRA), Exhibit B-2, Section 1.4.1, p. 1–17
Deferral account mechanism

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In the Application, BC Hydro is requesting approval of rates, effective May 1, 2021, to provide EV fast charging service.

1.2.8 Please explain whether any subsequent changes to the general rate increase of 1.16 percent requested in the F2022 RRA would impact the EV charging service rates requested in the Application. Why or why not?

RESPONSE:

BC Hydro does not expect that any subsequent changes to the general rate increase of 1.16 per cent requested in the Fiscal 2022 Revenue Requirements Application would impact the Proposed Rates.

As shown in Rate Schedules 1360, 1560 and 1561 included in Appendix B, BC Hydro proposes that:

> **The rate increases/decreases approved through the revenue requirements applications for a particular fiscal year will apply from fiscal 2023 onward.**

2.0 A. REGULATORY CONTEXT AND BACKGROUND

Reference: INTRODUCTION
Exhibit B-1, Section 1.3.2, pp. 6–7, Section 4.1, p. 25;
BC Hydro Fiscal 2022 Revenue Requirements Application (F2022 RRA), Exhibit B-2, Section 1.4.1, p. 1–17
Deferral account mechanism

On page 25 of the Application, BC Hydro states that the Proposed Rates are subject to any BCUC approved general revenue requirement increases or decreases.

1.2.9 Please clarify how the Proposed Rates will be increased or decreased in accordance with future revenue requirement general rate changes. For example, if an approved general rate change is 2 percent, would the time-based rate of $0.12/minute for 25 kW stations increase by 2 percent to $0.1224/minute?

RESPONSE:

As shown in the proposed rate schedules 1360, 1560 and 1561 included in Appendix B of the Application, the rate increases/decreases approved through the revenue requirements applications for a particular fiscal year will apply from fiscal 2023 onward.

If the approved rate for a 25 kW station for fiscal 2022 is 12 cents per minute and the approved general rate change for fiscal 2023 is 2 per cent, the fiscal 2023 rate for 25 kW station would be 12.24 cents per minute (12 cents per minute x 1.02% = 12.24 cents per minute).

It should be noted that the rate is pro-rated on a per-second basis for each Charging Session. The total bill for each Charging Session will be rounded to the nearest cent.

3.0 B. STAKEHOLDER ENGAGEMENT

Reference: RATE DESIGN
Exhibit B-1, Section 1.1, p. 3, Section 3.1, pp. 12–13, Appendix C, p. 2
Personal Interviews

On page 3 of the Application, BC Hydro states:

> … based on feedback from our customers, there is support for BC Hydro to now implement rates for our fast charging service. For example, almost two thirds of survey respondents indicate it is reasonable to charge a rate for the use of public fast charging stations…

On page 12, BC Hydro states:

> From August 20, 2020 to September 15, 2020, BC Hydro conducted nine, one-hour interviews over-the-phone with electric vehicle drivers in B.C. to gather feedback. Interviewees were selected from a pool of electric vehicle drivers who have engaged with BC Hydro in the past, representing organizations such as Vancouver Electric Vehicle Association, Victoria Electric Vehicle Club, Electric Vehicle Peer Network, Fraser Basin Council, BCIT Smart Microgrid Applied Research Team.

1.3.1 Please indicate the approximate number of candidates BC Hydro contacted to successfully conduct the nine telephone interviews with EV drivers.

RESPONSE:

Ten candidates were contacted and nine successfully completed the interviews.

3.0 B. STAKEHOLDER ENGAGEMENT

Reference: RATE DESIGN
Exhibit B-1, Section 1.1, p. 3, Section 3.1, pp. 12–13, Appendix C, p. 2
Personal Interviews

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1.3.1 Please indicate the approximate number of candidates BC Hydro contacted to successfully conduct the nine telephone interviews with EV drivers.

1.3.1.1 Please confirm, or otherwise explain, that all nine participants completed the interview questions in its entirety.

RESPONSE:

Confirmed. All candidates completed the interview questions in its entirety.

3.0 B. STAKEHOLDER ENGAGEMENT

Reference: RATE DESIGN
Exhibit B-1, Section 1.1, p. 3, Section 3.1, pp. 12–13, Appendix C, p. 2
Personal Interviews

In the interview guideline provided in Appendix C on page 2, BC Hydro sought feedback on the following pricing structures:

Subscription rate	Minimum fee + rate	After-hours discount	kWh-based rate
$100 a month for unlimited charging	$2 to connect, then $0.25 / minute to charge	50% off between midnight and 6 am	$0.35 per kWh

The interview guideline also notes pricing structure discussion topics regarding summer versus winter and urban versus rural.

On page 13, BC Hydro notes the following results:

> Regarding other potential pricing structures, interviewees overwhelmingly supported an electricity-based rate over a purely time-based rate. There was also support for a time-varying rate whereby the rate is lower overnight.

1.3.2 Please clarify why BC Hydro in its interviews provided the option of choosing a kWh-based rate recognizing that such a rate is not feasible at this time.

RESPONSE:

BC Hydro is aware that kWh-based EV fast charging rates are available in other countries and has thus included it to cover potential future rate designs in the interviews.

3.0 B. STAKEHOLDER ENGAGEMENT

Reference: RATE DESIGN
Exhibit B-1, Section 1.1, p. 3, Section 3.1, pp. 12–13, Appendix C, p. 2
Personal Interviews

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On page 13, BC Hydro notes the following results:

> Regarding other potential pricing structures, interviewees overwhelmingly supported an electricity-based rate over a purely time-based rate. There was also support for a time-varying rate whereby the rate is lower overnight.

1.3.3 Please discuss the feedback received regarding the subscription rate. Were there any indications as to whether the interview participants prefer a subscription rate more or less than a time-based rate?

RESPONSE:

BC Hydro did not ask interview participants to rank the different pricing models against each other; therefore, we are unable to definitively conclude if there is a preference for a subscription rate over a time-based rate, or vice-versa. While a subscription rate could appeal to some public electric vehicle fast charging station customers without a back-up charging option, it could lead to situations where drivers are overstaying at a charging station, thereby preventing access by other drivers.

Furthermore, BC Hydro's EV network management/billing system built by AddEnergie Technologies is currently not capable of charging a subscription rate.

3.0 B. STAKEHOLDER ENGAGEMENT

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Exhibit B-1, Section 1.1, p. 3, Section 3.1, pp. 12–13, Appendix C, p. 2
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On page 13, BC Hydro notes the following results:

> Regarding other potential pricing structures, interviewees overwhelmingly supported an electricity-based rate over a purely time-based rate. There was also support for a time-varying rate whereby the rate is lower overnight.

1.3.4 Please discuss the feedback received regarding a minimum fee. Please discuss why BC Hydro is not proposing a minimum fee in this Application.

RESPONSE:

Some of the interview participants expressed dislike for a minimum fee as it would encourage station users to extend their stay longer to obtain the full value of the minimum fee. BC Hydro is not proposing a minimum fee as our EV Network billing system is currently not capable of facilitating this type of fee structure.

3.0 B. STAKEHOLDER ENGAGEMENT

Reference: RATE DESIGN
Exhibit B-1, Section 1.1, p. 3, Section 3.1, pp. 12–13, Appendix C, p. 2
Personal Interviews

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The interview guideline also notes pricing structure discussion topics regarding summer versus winter and urban versus rural.

On page 13, BC Hydro notes the following results:

> Regarding other potential pricing structures, interviewees overwhelmingly supported an electricity-based rate over a purely time-based rate. There was also support for a time-varying rate whereby the rate is lower overnight.

1.3.5 Regarding the after-hours discount, please clarify whether the feedback received pertains to public DC fast charging only, or does the feedback also pertain to EV charging at home?

RESPONSE:

The scope of the interview was specific to public fast charging only.

3.0 B. STAKEHOLDER ENGAGEMENT

Reference: RATE DESIGN
Exhibit B-1, Section 1.1, p. 3, Section 3.1, pp. 12–13, Appendix C, p. 2
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On page 13, BC Hydro notes the following results:

> Regarding other potential pricing structures, interviewees overwhelmingly supported an electricity-based rate over a purely time-based rate. There was also support for a time-varying rate whereby the rate is lower overnight.

1.3.6 Please discuss the feedback received regarding summer versus winter rates and BC Hydro's consideration of such pricing structure when developing this Application.

RESPONSE:

Interview participants discussed how temperature plays a role in the speed of their electric vehicles charging. Their feedback and experience differed greatly based on their vehicle make/model, how they have used public fast charging, and where they live (e.g., coastal region vs. interior region).

BC Hydro does not currently have sufficient data regarding the relationship between ambient temperature and the electric vehicle charging speed to consider summer versus winter rates. We further note that as a winter peaking utility, BC Hydro's cost of service varies by season and any potential seasonal rates would also need to consider the fact that BC Hydro's costs of service are typically higher in winter then in spring or fall.

3.0 B. STAKEHOLDER ENGAGEMENT

Reference: RATE DESIGN
Exhibit B-1, Section 1.1, p. 3, Section 3.1, pp. 12–13, Appendix C, p. 2
Personal Interviews

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The interview guideline also notes pricing structure discussion topics regarding summer versus winter and urban versus rural.

On page 13, BC Hydro notes the following results:

> Regarding other potential pricing structures, interviewees overwhelmingly supported an electricity-based rate over a purely time-based rate. There was also support for a time-varying rate whereby the rate is lower overnight.

1.3.7 Please discuss the feedback received regarding urban versus rural rates and BC Hydro's consideration of such pricing structure when developing this Application.

RESPONSE:

Generally, participants in the interviews favoured consistency of pricing between urban and rural locations and did not see a need to differentiate, and BC Hydro did not consider differentiated urban and rural rates.

4.0 B. STAKEHOLDER ENGAGEMENT

Reference: RATE DESIGN
Exhibit B-1, Section 3.1, pp. 14–15, 18, Appendix D
Survey

On page 14 of the Application, BC Hydro states:

> BC Hydro commissioned Leger to conduct a web survey regarding electric vehicle fast charging service rates. The survey was conducted from August 26, 2020 to September 7, 2020. The survey, which returned 4,196 responses from 11,398 survey invitations, asked respondents for their opinion on paying to use fast charging station services and provided the opportunity to provide general feedback on rates and user experience.

Appendix D to the Application provides further information on the survey and detailed results. Appendix D indicates that a portion of the 2020 survey is a repeat of the 2019 EV Fast Charging Support Services Survey.

1.4.1 Please explain how Leger obtained the sample population to provide the survey invitations.

RESPONSE:

BC Hydro emailed an invitation link to the Leger survey to all BC Hydro electric vehicle network customers (at the time) who have opted in to receive communications from BC Hydro. BC Hydro is aware that this link was then shared on third-party websites.

Leger was not provided any customer information by BC Hydro and only received responses from customers who voluntarily completed the survey.

4.0 B. STAKEHOLDER ENGAGEMENT

Reference: RATE DESIGN
Exhibit B-1, Section 3.1, pp. 14–15, 18, Appendix D
Survey

On page 15, BC Hydro notes that 59 percent of respondents indicate it is reasonable to charge a rate for the use of a public fast charging station. 34 percent of respondents indicate public charging service is criterial to them and they have nowhere else to charge.

1.4.2 To the extent possible, please compare the 2020 survey against past survey findings regarding customer acceptance of non-free BC Hydro public fast charging stations. Has customer acceptance changed over time?

RESPONSE:

Past surveys that BC Hydro conducted regarding its public fast charging service include a 2019 BC Hydro public charging customer support satisfaction survey and a 2018 DC Fast Charger online survey. The questions asked in these surveys were not specific to "customer acceptance of non-free BC Hydro public fast charging stations."

Please refer to Attachment 1 to this response, which is the October 5, 2020 report that compares the 2020 fast charging support satisfaction survey results with the 2019 survey. In general, customer satisfaction improved between 2019 and 2020.

The 2018 DC Fast Charger online survey asked customers' preference on how they would prefer to pay for electricity when they use a fast charging station. The overwhelming majority would prefer to pay "by kWh" as opposed to paying "by time." The survey also asked how much customers are willing to pay at a 50 kW fast charging station under two scenarios where they are out driving, and their electric vehicle may need recharging. Most customers indicated that they would be willing to pay $6 per 30 minutes to charge their car. Please refer to Attachment 2 to this response for the 2018 DC Fast Charger online survey.

Report

Electric Vehicle Charging Stations Survey – Section A Results

BC Hydro
Power smart

DATE Oct 5, 2020 **PROJECT NUMBER** 41016-012

Table of Contents


Leger
Background and methodology

Background

BACKGROUND

Background

According to the BC Government, more than 30,000 electric vehicles (EVs) are currently being used in the province of BC. The popularity of EVs is growing dramatically--as of November 2019, 9% of all light-duty vehicle sales in BC are EVs, up from 4% in 2018. In terms of charging these vehicles, while most EV owners charge their cars at home, there are over 1,000 public charging stations in the province. BC Hydro currently operates 80 fast charging stations located along BC's major highways where users can charge their vehicles for free. There is also an associated call centre where users can call for support. The call centre is staffed by both BC Hydro employees and contractors.

Research Objectives

BC Hydro conducted research with its fast charging station users on the following topics:

- Gauging overall satisfaction with BC Hydro's EV Fast Charging support service;
- Gauging satisfaction with customer representatives at the call centre;
- Identifying the willingness to continue to use BC Hydro's Support Service;
- Identifying areas for improvement for BC Hydro's Support Service;
- Identifying types of issues that users have; and,
- Identifying user demographics.

Methodology

METHODOLOGY

The survey questionnaire consisted of two sections (Section A and Section B). Section A is a repeat of the 2019 EV Fast Charging Support Services Survey, while Section B was a new set of questions regarding fast charging rates and the fast charging experience overall. Two target groups were defined for this survey. The first target group (1,034 records) completed both Section A and Section B questions, while the second group (10,364 records) got Section B questions only. This report shows the results for the first target group for Section A only and compares them to the 2019 survey. Results for Section B have been provided under separate cover.

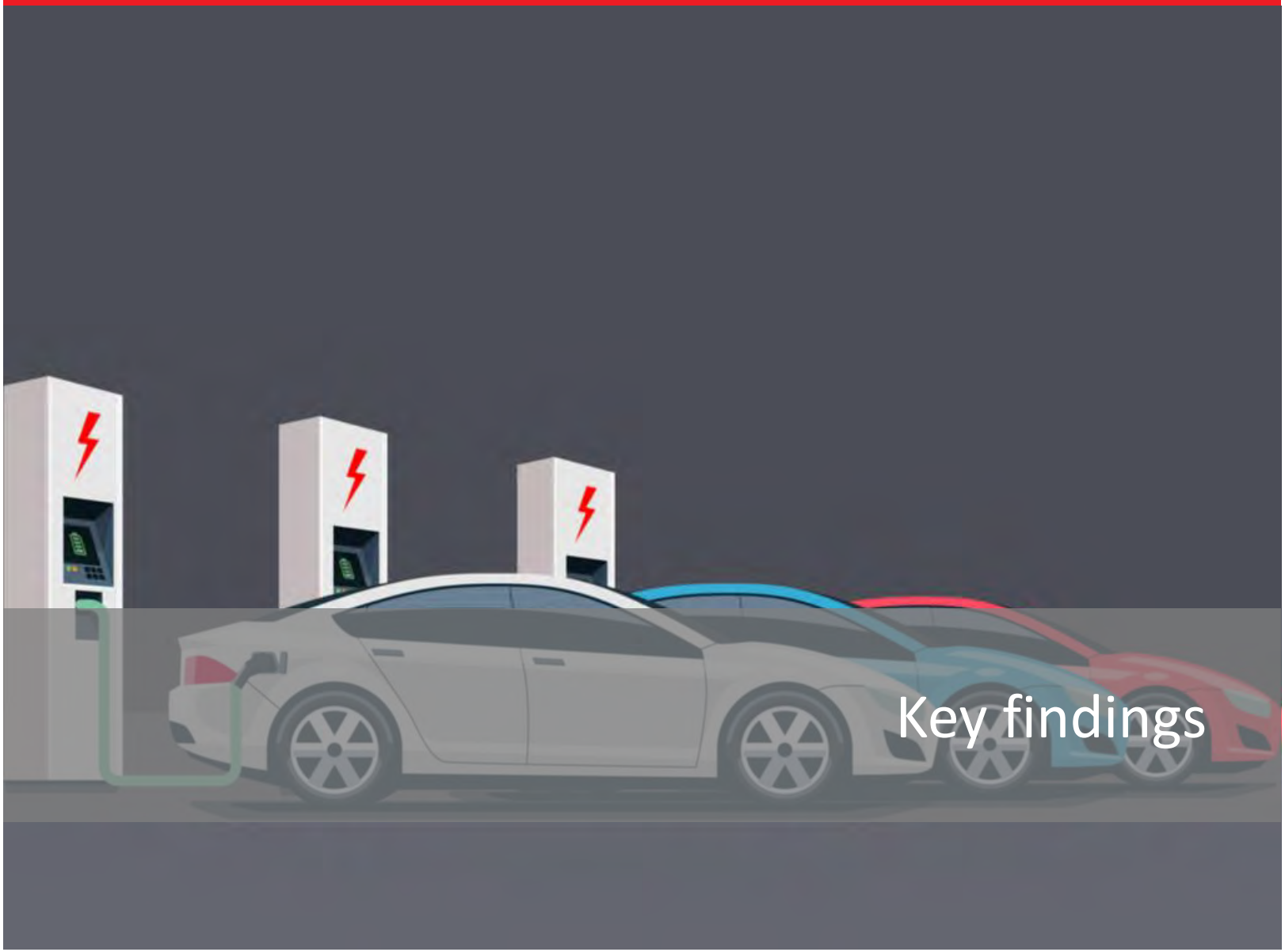
Data collection methodology – web survey

Number of completions – 4,196 overall, including 346 completions for target group 1 and 3,850 completions for target group 2. Please note, the results in this report (not including demographics) are based on the 269 target group 1 respondents who called the BC Hydro support and were able to speak to a customer representative. Those who did not speak to a representative continued with Section B questions only.

Fieldwork was conducted from August 26 to September 7, 2020

Leger was responsible for survey hosting and programming, providing the survey links for each target group, data collection and data processing. BC Hydro deployed the survey links via email to the two target groups, who are all BC Hydro charging station users.

*Please note, all data in this report, with a few exceptions, are rounded to the nearest percentage. Because of this, some tables and charts may not add up to 100% exactly.



Key findings

Key Findings

Satisfaction with BC Hydro Support and main issues at the station

- Overall, EV charging stations users are satisfied (91%) with BC Hydro's Public EV Fast Charging Support and almost all say they will continue to use this service (94%). Both these ratings improved upon the 2019 results.
- Common inquiry types this year include mobile app related issues (29%), Greenlots Account-related issues (21%), charging unexpectedly stopped (15%), and station out of service (15%). While unresolved station issue was the main inquiry type last year, only 10% called about this in 2020.

Wait time and number of customer representatives

- More users in 2020 only have to wait less than 5 minutes to be connected to a customer representative compared to last year (83% in 2020, a jump from 71% in 2019), and fewer have a longer wait of 5 to 10 minutes (14% in 2020, down from 21% in 2019).
- Nine in ten mention they spoke to one representative, a 4-point increase from 2019. Only 9% of users were connected with two or more customer representatives during the call (dropping from 13% in 2019).

Key Findings

Inquiry status

- Seven in ten customers feel their issue was fully resolved during their call to Fast Charging support, an 8-point increase from 2019. The inquiry was resolved partially for 12% of users (no change from 2019), and for 19% their issue was not resolved at all (vs. 27% in 2019).
- Seven in ten (72%) of those whose issue was fully resolved say it took less than 5 minutes to do it (better than 64% in 2019).
- Users who had an unresolved issue went looking for another charging station (57% in 2020, up from 44% in 2019), went home (17% in 2020, 21% in 2019), or figured it out by themselves (15% in 2020, 9% in 2019).

Satisfaction with the customer representative and service aspects

- Overall satisfaction with customer representatives improved this year (95% in 2020, 88% in 2019). Satisfaction with aspects of service also jumped, with the highest increase for the **ability to explain clearly the next steps** (86%, up 11% from 2019), followed by the **ability to resolve the call** (83%, up 9% from 2019).

Areas for improvement

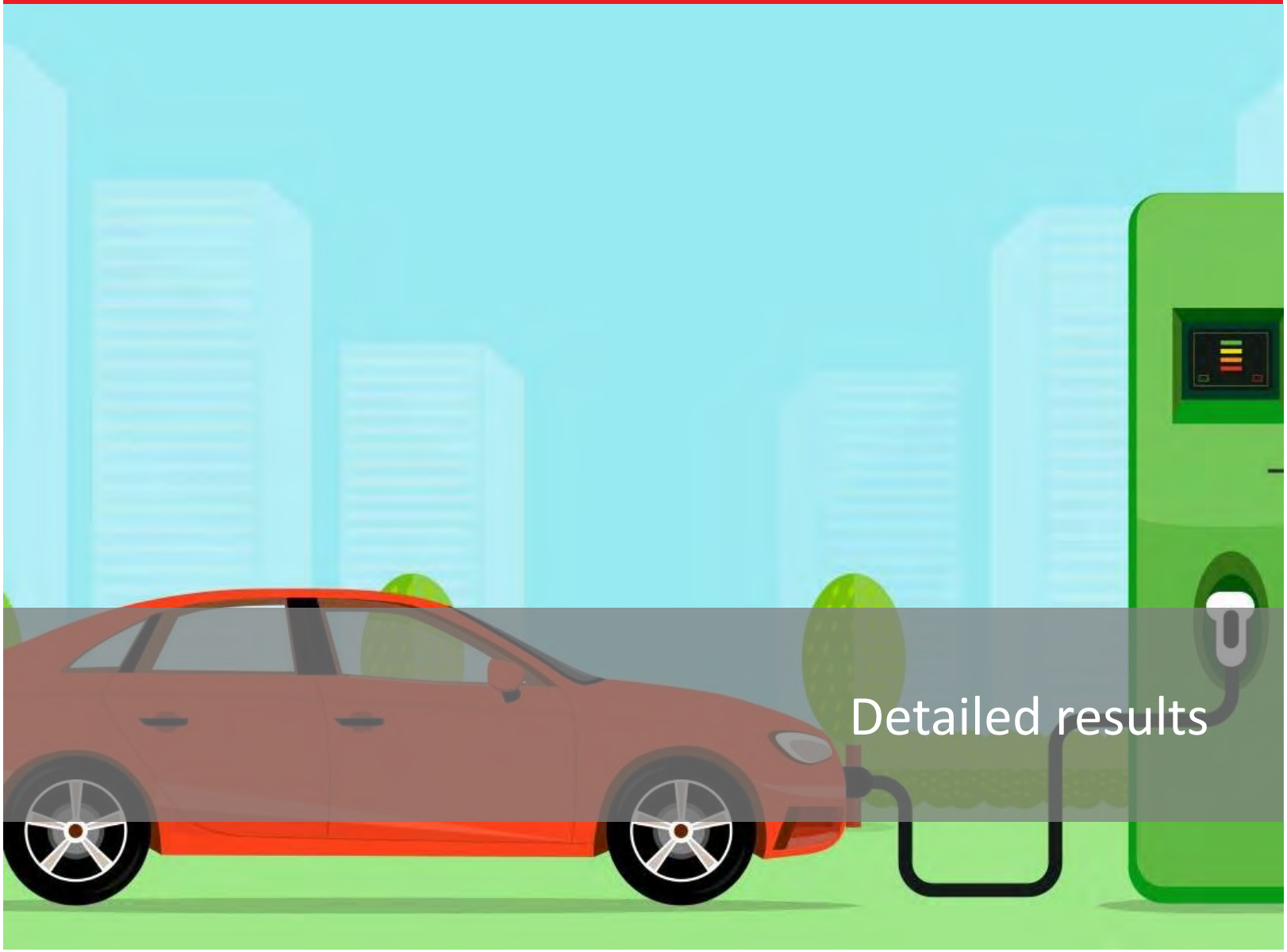
- Users feel it would be useful to have more charging stations in good locations (14%), better maintenance of stations (7%), and upgraded applications that are more user-friendly (5%). As well, 14% of customers mention they had a good experience with BC Hydro Charging Stations.

Key Findings

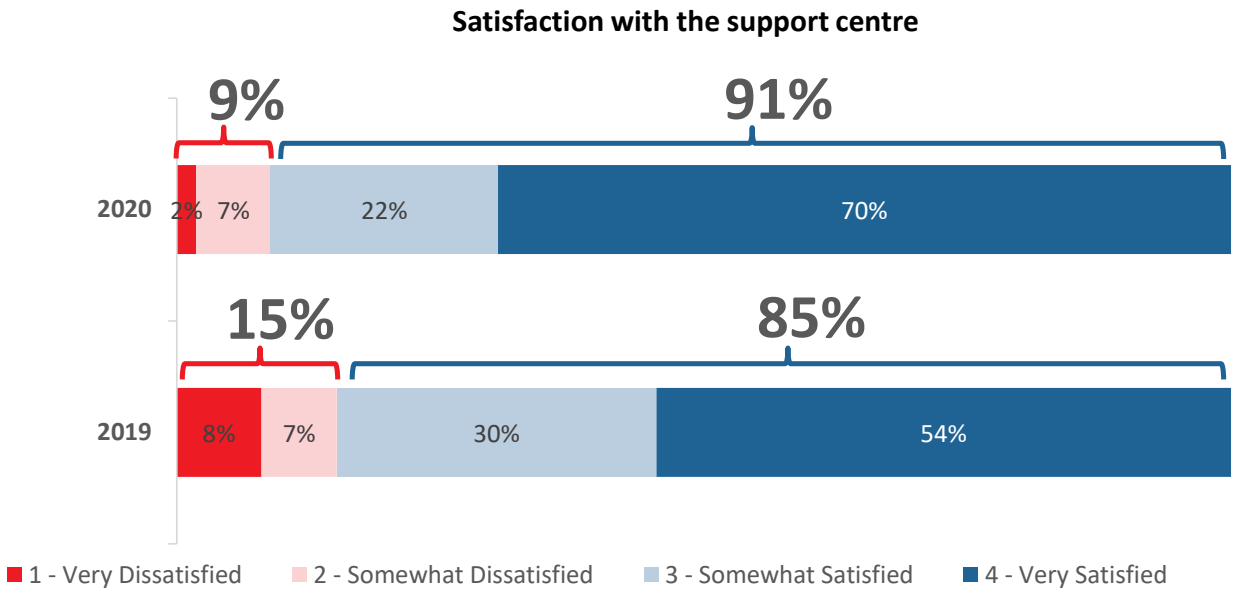
Kudos on great service!

- Overall, all service ratings improved in 2020 compared to 2019, indicating a strong commitment to improving customer service at BC Hydro's Public EV Fast Charging Support service.

- These high ratings can continue to be maintained over the next year by considering aspects including reducing wait time and fully resolving issues in one service call. As well, BC Hydro may wish to look at continuing to improve the mobile app (which was the most common issue for calls) and resolving Greenlots Account-related issues.

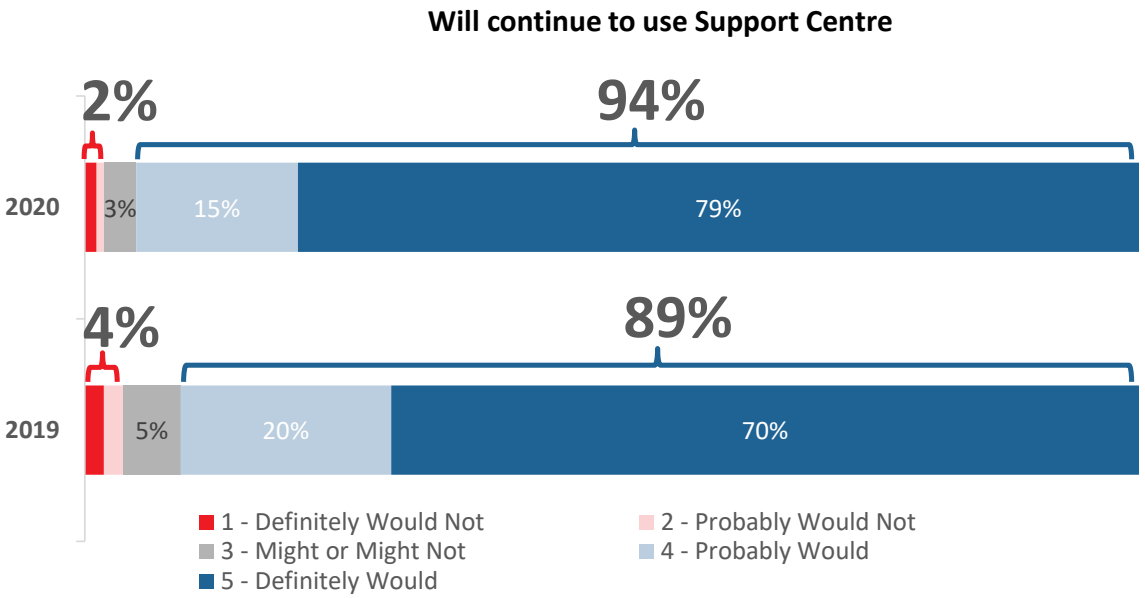

Detailed results

Nine in ten users are satisfied with BC Hydro's EV Charging support, a 6-point jump from 2019.



Q1. Overall how satisfied are you with BC Hydro's Public EV Fast Charging Support?
Base: Total 2020, n=269; Total 2019, n=112.

Over nine in ten would continue to use BC Hydro's EV Fast Charging Support, up 5% from last year.

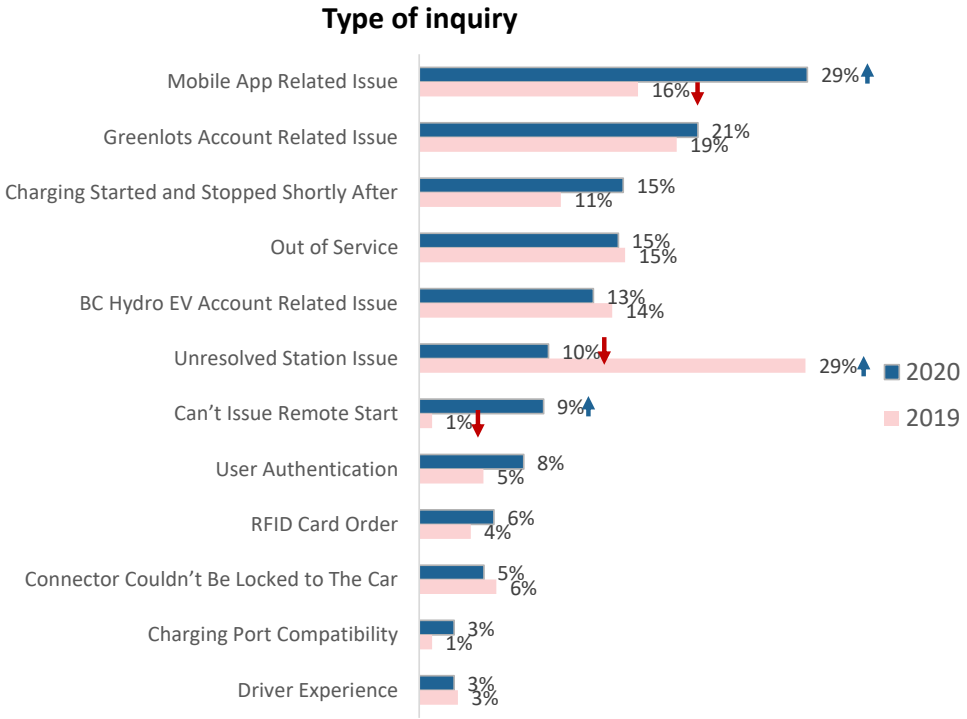


Please note mentions less than 3% are not labelled on the chart

Q2. Based on your last call to their call centre and if you had the choice, would you continue to use BC Hydro's Public EV Fast Charging Support?

Base: Total 2020, n=269; Total 2019, n=112.

A mobile app issue is the most common inquiry type in 2020, while unresolved station issues were mostly mentioned by users in 2019.



Significantly higher results compared to the other group

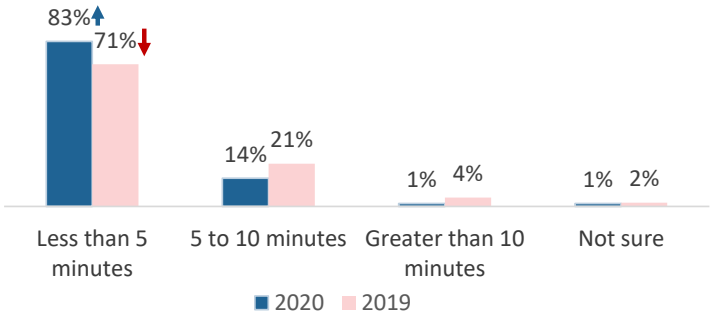
Significantly lower results compared to the other group

Q3. What kind of inquiry did you have when you called their call centre?

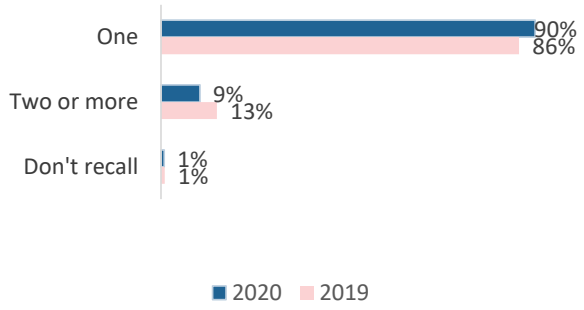
Base: Total 2020, n=269; Total 2019, n=104.

Wait times improved in 2020 as a higher proportion (83%) waited less than 5 minutes to be connected to a customer representative than in 2019 (71%).

Waiting time to be connected to a customer representative



Customer representatives



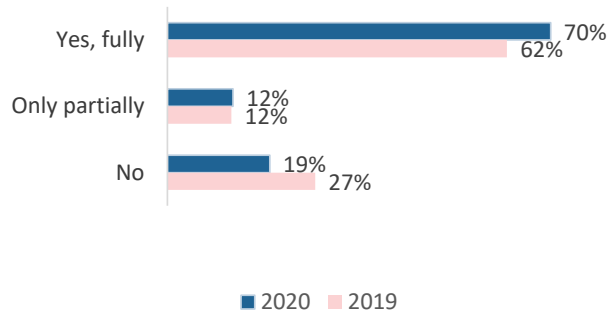
Significantly higher results compared to the other group

Significantly lower results compared to the other group

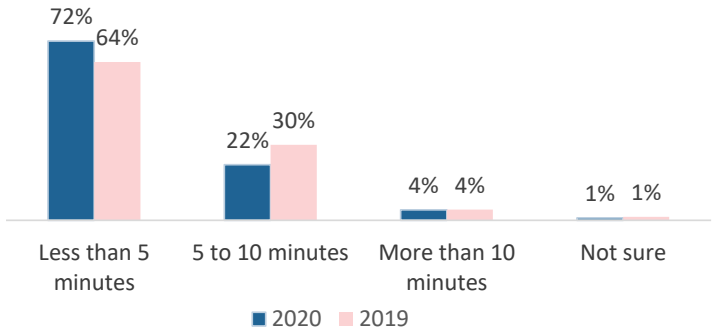
Q4. How long did it take for you to be connected to a customer representative? Q5. How many customer representatives did you speak to during your call?
Base: Total 2020, n=269; Total 2019, n=112.

Seven in ten say their inquiry was fully resolved, up 8-points from last year; more users in 2020 also note their enquiry took less than 5 minutes to resolve.

Inquiry resolving status

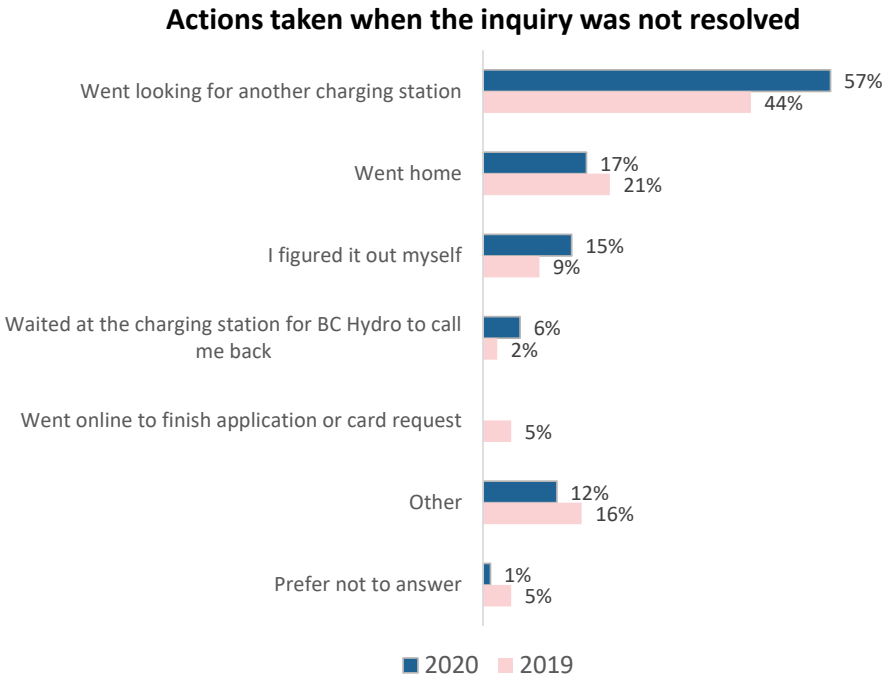


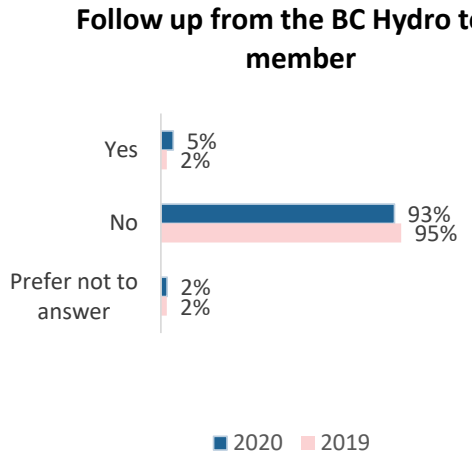
Time for resolving the inquiry



Q6. Was your inquiry eventually resolved during your call? Base: Total 2020, n=269; Total 2019, n=112.
Q7. How long did it take for your inquiry to be resolved once you were connected to a representative? Base those whose inquiry was resolved: 2020, n = 187; 2019, n=69.

The most common action for those users whose inquiry was not resolved is looking for another charging station.

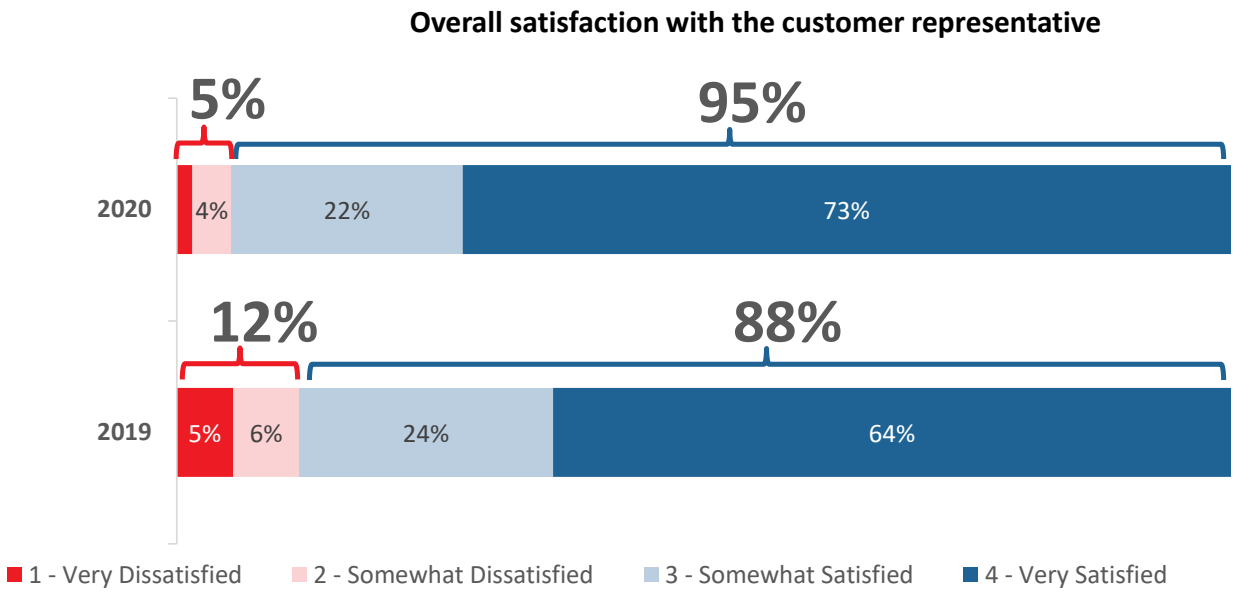




Q8_a. What did you do after you ended the call with BC Hydro's representative? Q8. Did a BC Hydro Team Member follow up with you afterwards?

Base those whose inquiry was not resolved: 2020, n=82; 2019, n=43.

Over nine in ten are satisfied overall with their customer representative, a 7-point jump from 2019.

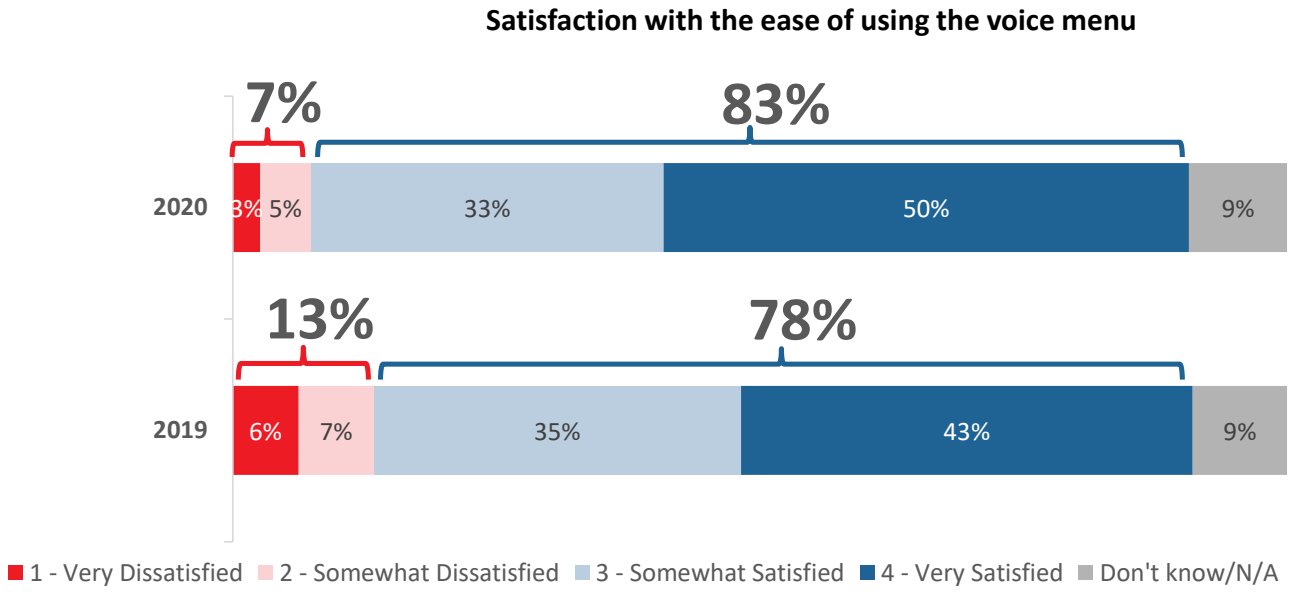


Please note mentions less than 3% are not labelled on the chart

Q9B. Overall, how satisfied are you with the customer representative who handled the call?

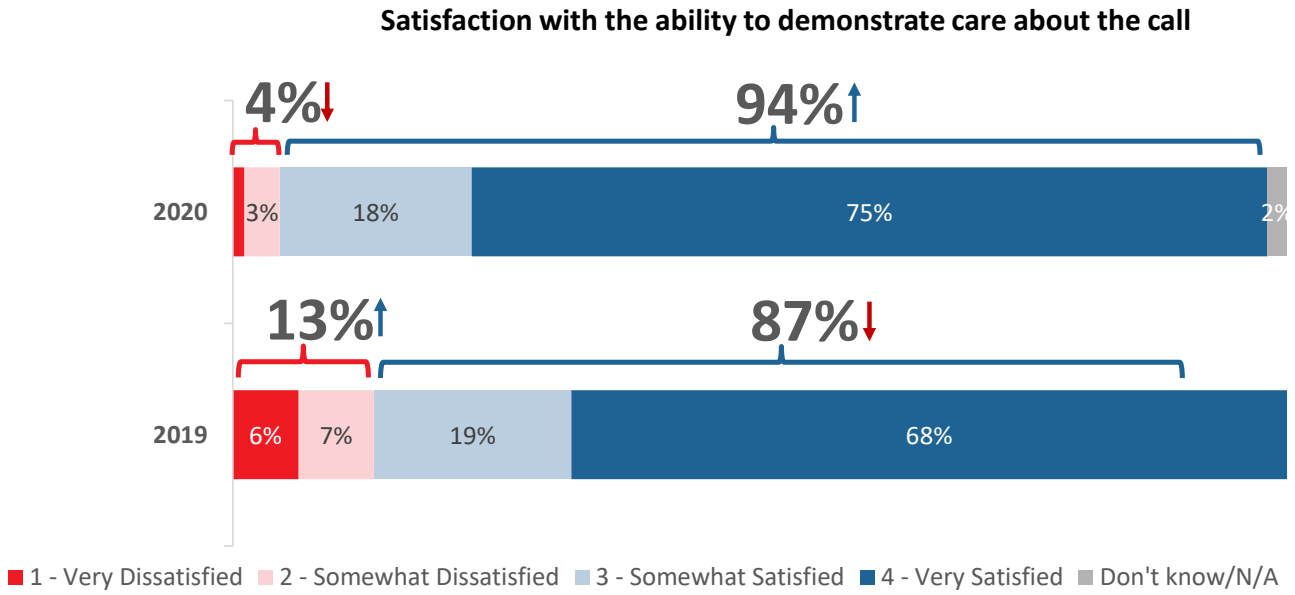
Base: Total 2020, n=269; Total 2019, n=112.

Over eight in ten customers are satisfied with the ease of using the voice menu in 2020.



Q10. How satisfied were you with the ease of using the voice menu system to connect you to the right customer representative?
Base: Total 2020, n=269; Total 2019, n=112.

Over nine in ten are satisfied with the customer representative's ability to demonstrate that they are caring about the call, a significant 7-point increase from 2019.



Significantly higher results compared to the other group

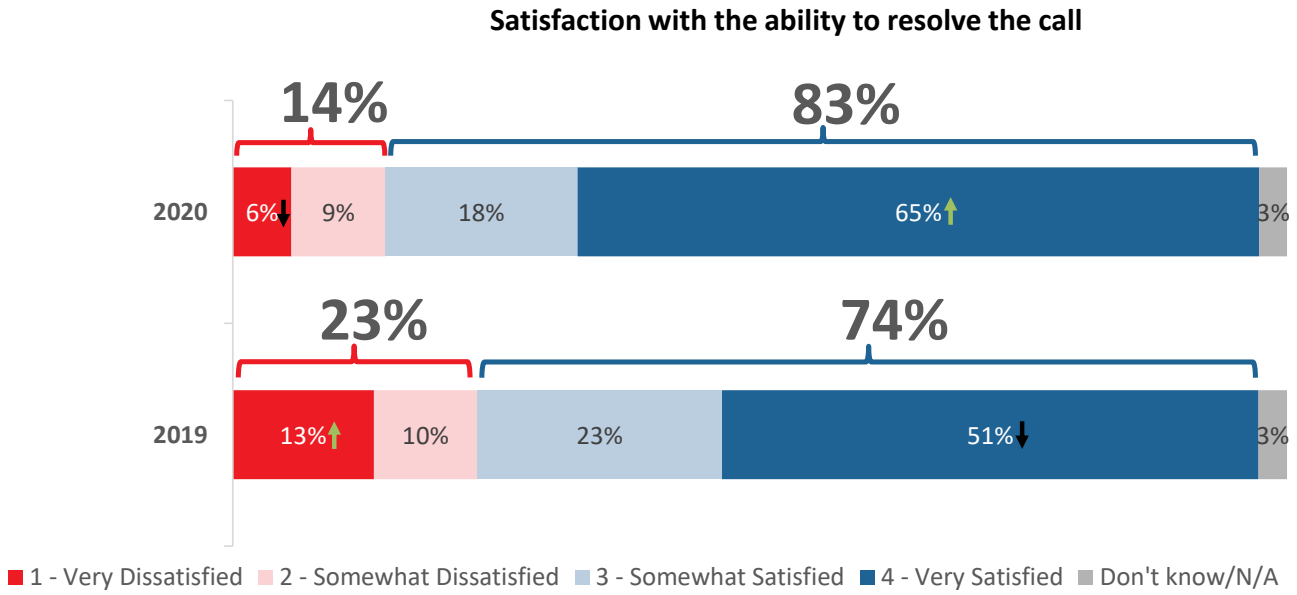
Significantly lower results compared to the other group

Please note mentions less than 3% are not labelled on the chart

Q11. How satisfied were you with the customer representative's ability to demonstrate that they genuinely cared about handling your call?

Base: Total 2020, n=269; Total 2019, n=112.

More users are satisfied with the customer representative's ability to resolve the call (83%) compared to 2019 (74%)



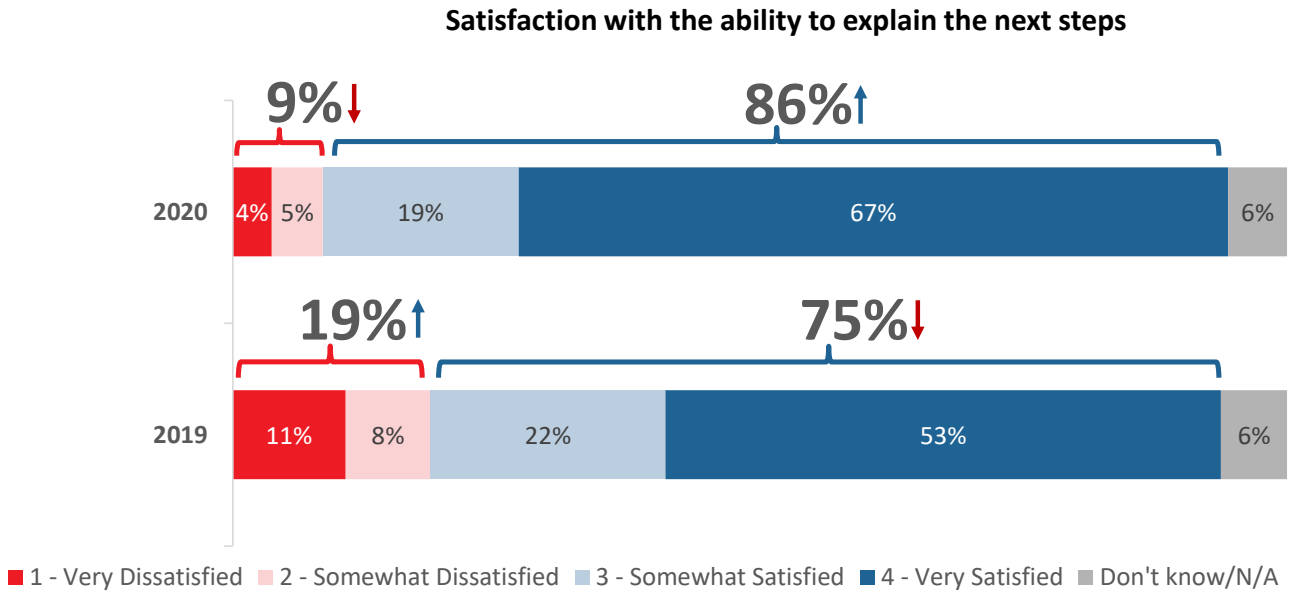
Significantly higher results compared to the other group

Significantly lower results compared to the other group

Q12. How satisfied were you with the customer representative's ability to resolve your call?

Base: Total 2020, n=269; Total 2019, n=112.

Over eight in ten are satisfied with the customer representative's ability to explain clearly the next steps, a significant 11-point increase from last year.



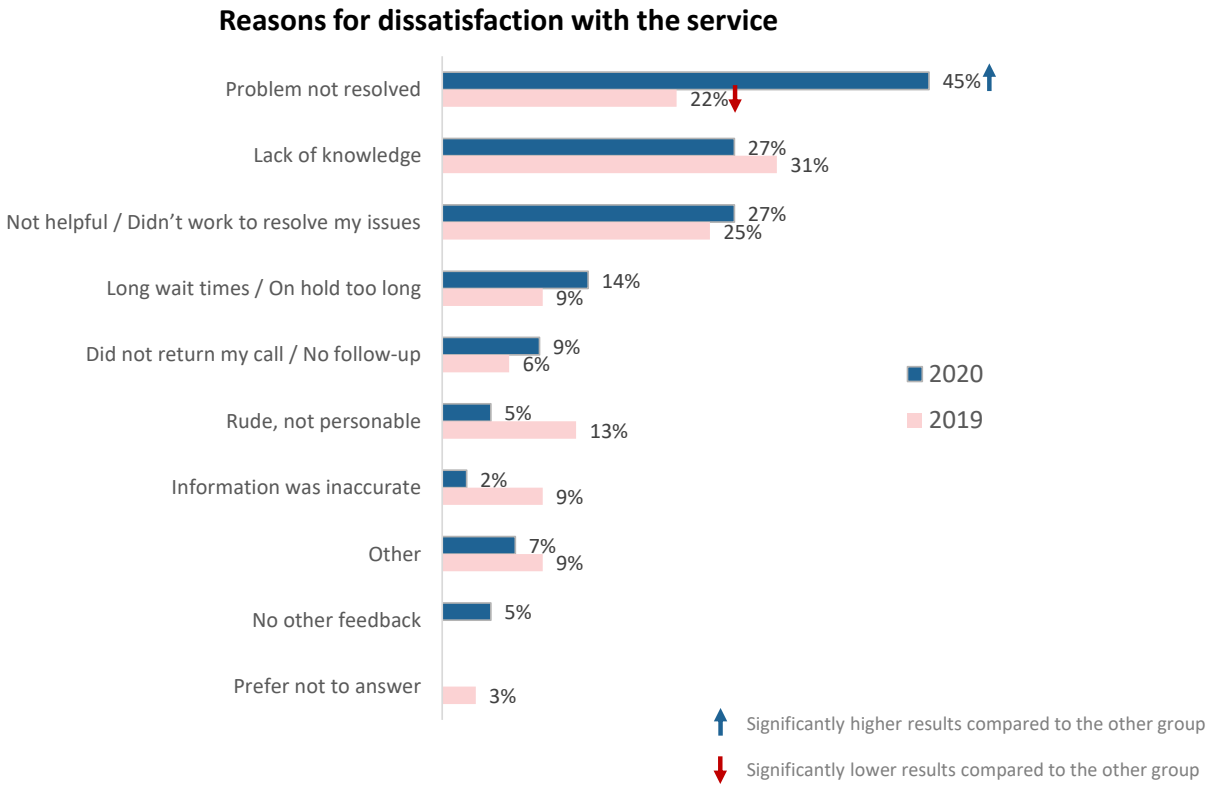
Significantly higher results compared to the other group

Significantly lower results compared to the other group

Q13. How satisfied were you with the customer representative's ability to explain clearly the next steps that were required to solve your inquiry or problem?

Base: Total 2020, n=269; Total 2019, n=112.

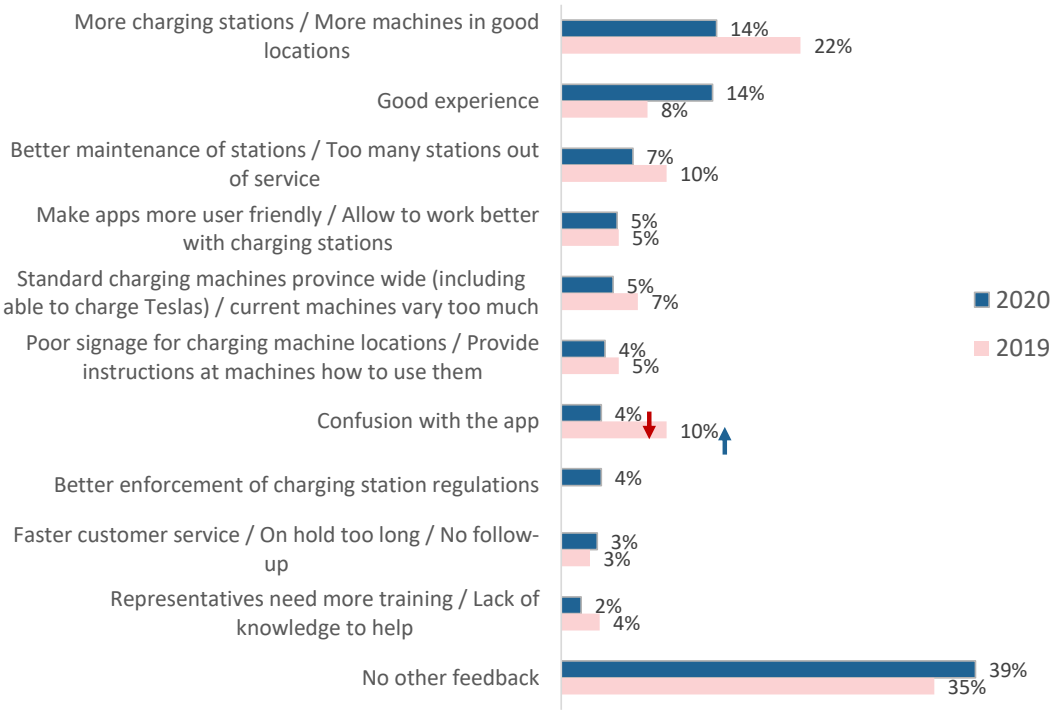
The main reason for dissatisfaction with service aspects in 2020 is the problem was not resolved (45%). Lack of knowledge (31%) was the most common complaint in 2019.



Q14. You indicated you were dissatisfied with some aspects of the representative's service. Can you please explain why? (Multiple mentions)

Base: Those who are not satisfied with some aspects of service, 2020, n=44; 2019, n=32.

Areas for improvement



Q15. Do you have any other feedback to provide to BC Hydro about the EV Fast Charging Station experience? (Multiple mentions)

Base: Total 2020, n=269; Total 2019, n=112.

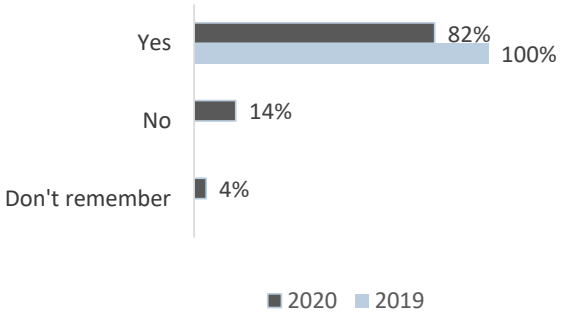
↑ Significantly higher results compared to the other group

↓ Significantly lower results compared to the other group

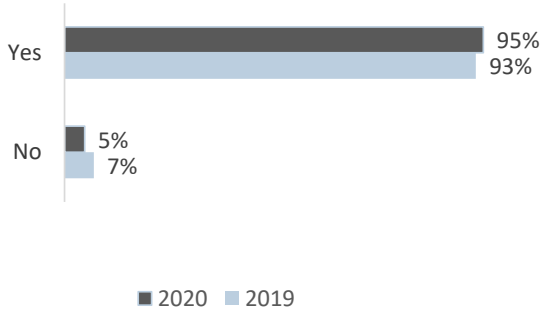
EV Demographics

Screener questions

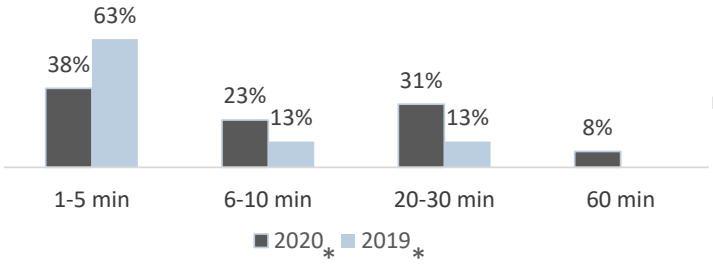
Did you call BC Hydro for support relating to one of their Public EV Fast Charging Stations at any time this year?



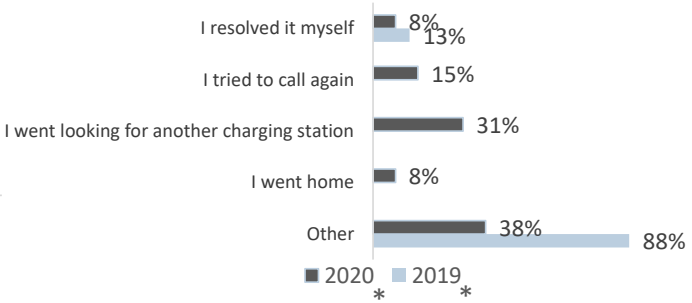
Were you able to speak to a BC Hydro customer representative during this call?



How long did you wait before you hung up?



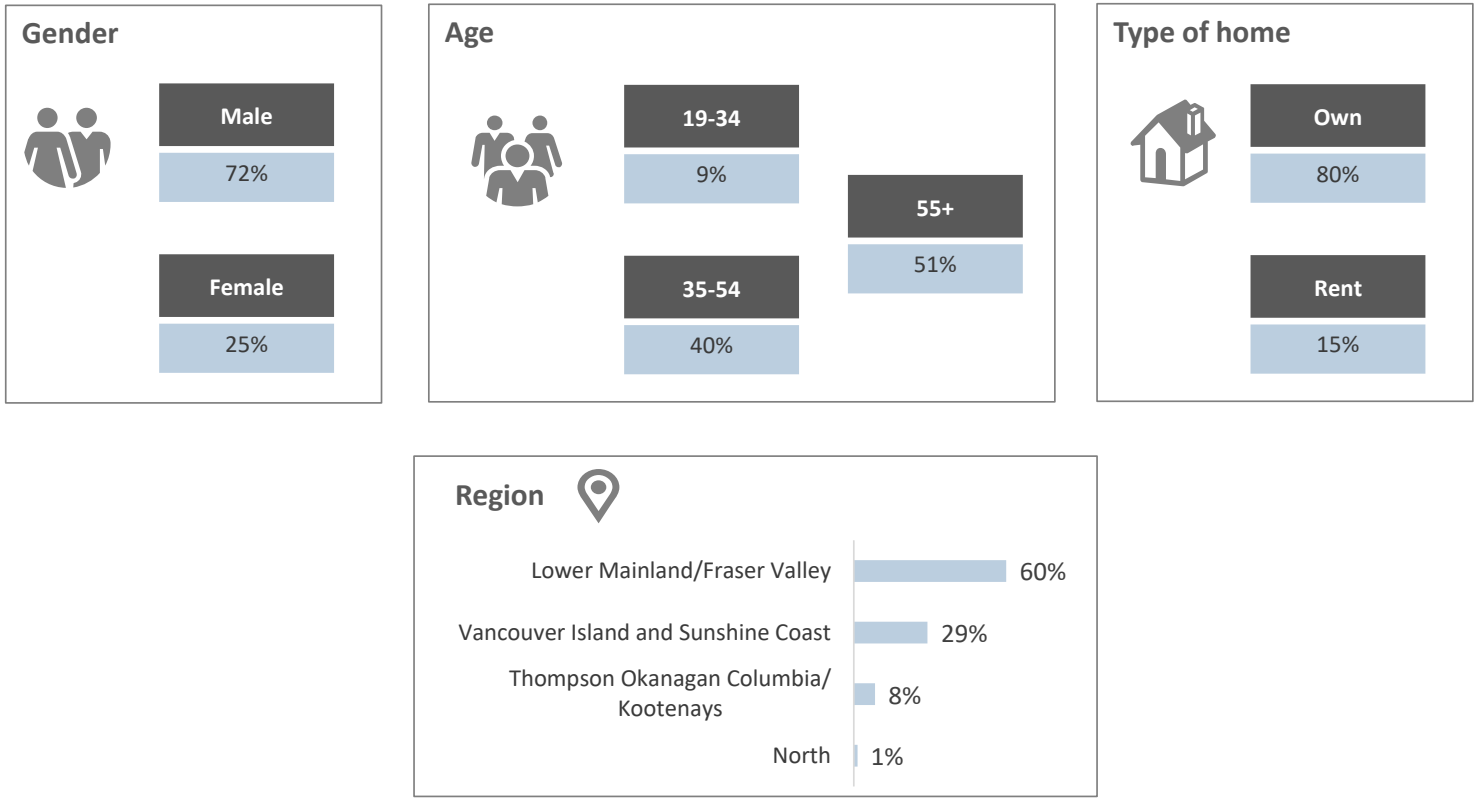
What was your next step to resolve the issue?



* *Note small base size* ***Those who said yes at QS1 continued with Section A and Section B questions, while those who said no at QS1 continued with Section B only*

QS1. To confirm, did you call BC Hydro for support relating to one of their Public EV Fast Charging Stations at any time this year? Base: Total 2020, n=346; Total 2019, n=120.
QS2. Were you able to speak to a BC Hydro customer representative during this call? Base those who called BC Hydro for support: 2020, n=283; 2019, n=120.
QS3. How long did you wait before you hung up? Base those who were not able to speak to a customer representative: 2020, n=13; 2019, n=8.
QS4. What was your next step to resolve the issue? Base those who were not able to speak to a customer representative: 2020, n=13; 2019, n=8.

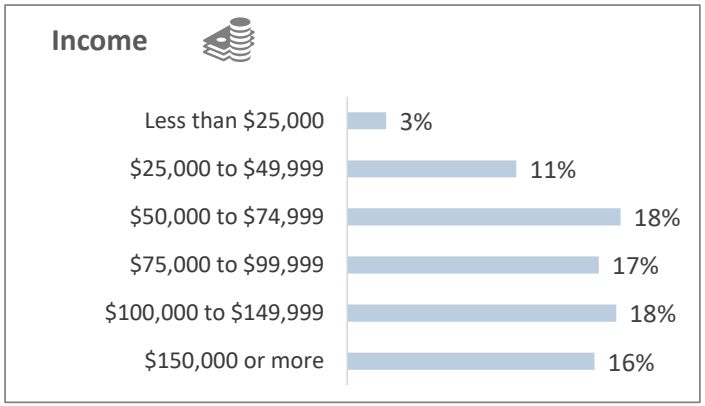
Demographics

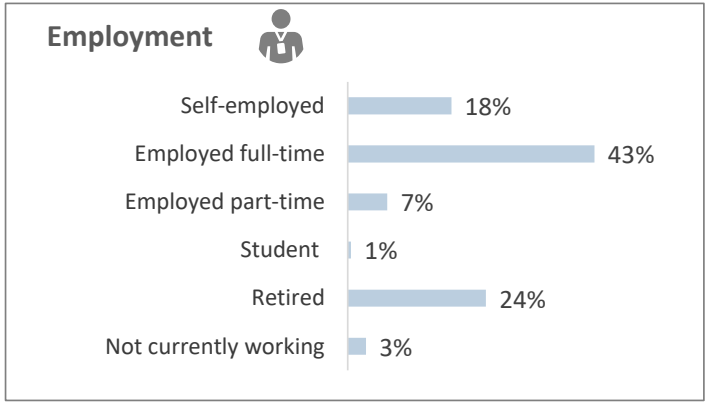


D1. Which of the following age groups do you fall under? D2. Which of the following do you identify as? D3. Which of these BC Regions do you live in? D4. Do you currently rent or own your home?

Base: Total 2020, n=346.

Demographics





D5. Which of the following best describes your employment status? D6. Which of the following categories best describes your total household income before taxes?
Base: Total 2020, n=346.

Appendix

Questionnaire

BC Hydro EV Support Survey
ONLINE FINAL

LANDING PAGE

Thank you for accepting our invitation to complete this survey.

We're always looking for ways to improve our services to ensure they meet our customers' needs and we'd love to hear about your experience with the Electric Vehicle (EV) support service. Please complete this survey to share your insights with us – it will only take approximately 10 minutes of your time.

Participants who complete the survey are eligible to be entered in a draw for one of five $50 Amazon gift cards by providing their name and contact information at the end of this survey. This survey will close September 7, 2020. Your opinions are extremely important to us.

BC Hydro is collecting this information in accordance with our mandate under the Hydro and Power Authority Act. The information will help us to better understand and improve the customer experience. All responses are submitted in confidence and treated accordingly. If you choose to participate in the optional gift card draw, be assured that your personal information will be managed separately from the survey questions so that your responses are not identified.

When you are ready to go to the next page, simply hit the **>** button at the bottom of the page. If you wish to go back and change a response on a previous page, hit the **<** button. Please **DO NOT** use the forward or back buttons of your browser (top of page).

If you have any questions about the study, please don't hesitate to contact BC Hydro EV support at 1-866-338-3369 or by email at evsupport@bchydro.com For any technical issues, please contact Leger Research by email at damirkhanova@leger360.com

Thanks again from BC Hydro.

QUESTIONS – Screeners

S1. To confirm, did you call BC Hydro for support relating to one of their Public EV Fast Charging Stations at any time this year?
Please select one response.
1. Yes
2. No [section B – rates section]
98. Don't remember [section B – rates section]
99. Prefer not to answer [section B – rates section]

S2. Were you able to speak to a BC Hydro customer representative during this call?
Please select one response.
1. Yes *(Go to question 1)*
2. No *(Ask S3 thru S5 then* section B – rates section*)*
99. Prefer not to answer [section B – rates section]

S3. How long did you wait before you hung up? (Note: your best guess is OK.)
Please record the number of minutes in the box below.
____ Minutes
99. Prefer not to answer

S4. What was your next step to resolve the issue?
Please select one response.
1. I resolved it myself
2. I tried to call again
3. I went looking for another charging station
4. I went home
95. Other [please specify]
99. Prefer not to answer

S5. Do you have any other feedback about that experience for BC Hydro?
Please provide as much detail as possible in the box below.
[open end]
CHECKBOX FOR "No other feedback"
99. Prefer not to answer

QUESTIONS – Main Body

Q1. Overall how satisfied are you with BC Hydro's Public EV Fast Charging Support?
Please select one response.
4. Very Satisfied
3. Somewhat Satisfied
2. Somewhat Dissatisfied
1. Very Dissatisfied

Q2. Based on your last call to their call center and if you had the choice, would you continue to use BC Hydro's Public EV Fast Charging Support?
Please select one response.
5. Definitely Would
4. Probably Would
3. Might or Might Not
2. Probably Would Not
1. Definitely Would Not
98. Don't Know
99. Prefer not to answer

[SHOW ON SCREEN:] For the following questions please think of the last call you made to the EV Fast Charging Support Centre.

Q3. What kind of inquiry did you have when you called their call centre?
Please select all that apply.

Questionnaire

1. Mobile App Related Issue
2. Greenlots Account Related Issue
3. BC Hydro EV Account Related Issue
4. RFID Card Order
5. Refund Request
6. Unresolved Station Issue
7. Safety Concerns
8. Authorization Hold
9. Charging Started and Stopped Shortly After
10. Connector Couldn't Be Locked to The Car
11. Power Outage
12. Out of Service
13. Insufficient Balance
14. Direction to The Nearest Station
15. EV Incentive Inquiry
16. Can't Issue Remote Start
17. Charging Port Compatibility
18. Charging Slow After 80% Full
19. Inaccurate PlugShare Status
20. Inaccurate BC Hydro App Status
21. Charging Fees
22. Station Hardware Damage
23. User Authentication
24. Parking Without Charging
25. Driver Experience
26. Other (Please specify)
99. Prefer not to answer

Q4. How long did it take for you to be connected to a customer representative?
Please select one response.
1. Less than 5 minutes
2. 5 to 10 minutes
3. Greater than 10 minutes
98. Not sure
99. Prefer not to answer

Q5. How many customer representatives did you speak to during your call?
Please select one response.
1. One
2. Two or more
98. Don't recall
99. Prefer not to answer

Q6. Was your inquiry eventually resolved during your call?
Please select one response.
1. Yes, fully *(Go to question 7)*
2. Only partially *(Go to QNEW_8a)*
3. No *(Go to question NEW_8a)*

99. Prefer not to answer

Q7. How long did it take for your inquiry to be resolved once you were connected to a representative?
[GO TO INSTRUCTION BEFORE SCRIPT 1 AFTER THIS QUESTION]
Please select one response.
1. Less than 5 minutes
2. 5 to 10 minutes
3. More than 10 minutes
98. Not sure
99. Prefer not to answer

[ASK NEW_Q8a AND Q8 IF INQUIRY UNRESOLVED (I.E., Q6=NO OR PARTIALLY]
NEW_Q8a: What did you do after you ended the call with BC Hydro's representative?
Please select all that apply.
1. I figured it out myself
2. Waited at the charging station for BC Hydro to call me back
3. Went looking for another charging station
4. Went home
95. Other [please specify]
99. Prefer not to answer

Q8. Did a BC Hydro Team Member follow up with you afterwards?
Please select one response.
1. Yes
2. No (Go to instruction at Script 1)
99. Prefer not to answer

[ASK Q9 IF Q8=yes]
Q9. How long did it take for BC Hydro Team Member to follow up with you?
*Please record the number of minutes **or** hours in the appropriate box below.*

____ Minutes or ___Hours

Script 1 (where issue was not resolved by first CSR: Q5 >1)
For the remaining questions it is very important that your rating choices are based on the **First** customer representative that you spoke to. [Continue to Script 2].

***Script 2** (show to **all** customers)*

For these questions we would like to understand your satisfaction using a rating scale of 1 to 4 where 1 = very dissatisfied, 2 = dissatisfied, 3 = satisfied and 4 = very satisfied. Of course, you may use any number between 1 and 4 that best describes your level of satisfaction for each question.

[ASK ALL]
Q9B. Overall, how satisfied are you with the [if Q5>1, first] customer representative who handled the call?
Please select one response.

Questionnaire

4. Very Satisfied
3. Somewhat Satisfied
2. Somewhat Dissatisfied
1. Very Dissatisfied

Opening

	4 = Very Satisfied	3 = Satisfied	2 = Dissatisfied	1 = Very Dissatisfied	Don't know/ Not applicable
Q10. How satisfied were you with the ease of using the voice menu system to connect you to the right customer representative?	❑	❑	❑	❑	❑

Treating

Q11. How satisfied were you with the customer representative's ability to demonstrate that they genuinely cared about handling your call?	❑	❑	❑	❑	❑

Resolving

Q12. How satisfied were you with the customer representative's ability to resolve your call?	❑	❑	❑	❑	❑
Q13. How satisfied were you with the customer representative's ability to explain clearly the next steps that were required to solve your inquiry or problem?	❑	❑	❑	❑	❑

[if any of Q11-13 have Somewhat / Very Dissatisfied answers, ask Q14]
Q14. You indicated you were dissatisfied with some aspects of the representative's service. Can you please explain why?
Please provide as much detail as possible in the box below.
[open end]
99. Prefer not to answer

5

[ASK ALL]
Q15. Do you have any other feedback to provide to BC Hydro about the EV Fast Charging Station experience?
Please provide as much detail as possible in the box below.
[open end]
CHECKBOX FOR "No other feedback"
99. Prefer not to answer

6

Questionnaire

Thank you for your responses so far. We have just a few more questions to go for classification purposes.

D1. Which of the following age groups do you fall under?

1. 19 to 24
2. 25 to 34
3. 35 to 44
4. 45 to 54
5. 55 to 64
6. 65 to 74
7. 75+

99. Prefer not to answer

D2. Which of the following do you identify as?

1. Male
2. Female

95. Other
99. Prefer not to say

D3. Which of these BC Regions do you live in?

1. Lower Mainland/Fraser Valley (Vancouver to Hope, including Whistler and Squamish)
2. Vancouver Island and Sunshine Coast (including Powell River)
3. Thompson Okanagan Columbia/Kootenays
4. North (100 Mile House, Williams Lake, Prince George and north)

99. Prefer not to answer

D4. Do you currently rent or own your home?

1. Own
2. Rent

99. Prefer not to answer

D5. Which of the following best describes your employment status?

1. Self employed
2. Employed full-time
3. Employed part-time
4. Student
5. Retired
6. Not currently working (e.g. unemployed, homemaker, and on leave)

95. Other (please specify)
99. Prefer not to answer

D6. Which of the following categories best describes your total household income before taxes?

1. Less than $25,000
2. $25,000 - $49,999
3. $50,000 - $74,999
4. $75,000 - $99,999
5. $100,000 - $149,999
6. $150,000 or more

98. Don't know
99. Prefer not to answer

<Add in questions for contest>

Contest details

9

D7. Finally, would you like to enter the contest for a chance to win a $50 Amazon gift card?

1. Yes (Go to D8)
2. No (GO TO END)

D8. Please provide the following contact details to enter the contest.

Contest Terms (please attach the "BC Hydro EV Network Members Survey_Contest Rules.pdf")

Your personal information will be handled in accordance with the BC Freedom of Information and Protection of Privacy Act and will be used solely as a means of contacting you should you win the draw.

First name:
Last name:
Email address:
Phone number:

D9. Would you be interested in participating in future research from BC Hydro?

1. Yes (if yes please provide your email address)
2. No

END: Your feedback is very much appreciated. Again, thank you. For news and updates on BC Hydro EV programs, please check bchydro.com/ev.

10

OUR CREDENTIALS

Leger is a member of the Canadian Research Insights Council (CRIC), the industry association for the market/survey/insights research industry.

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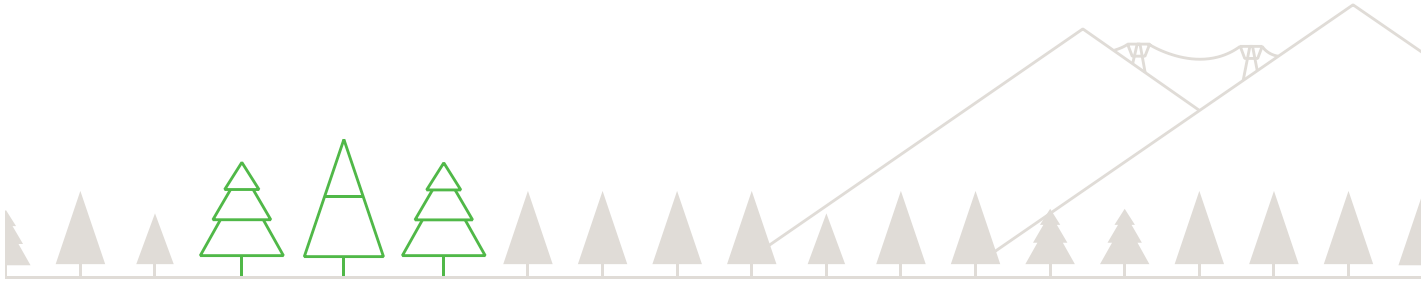
2018 DC Fast Charging Survey Results



May 2018

BC Hydro
Power smart

Methodology

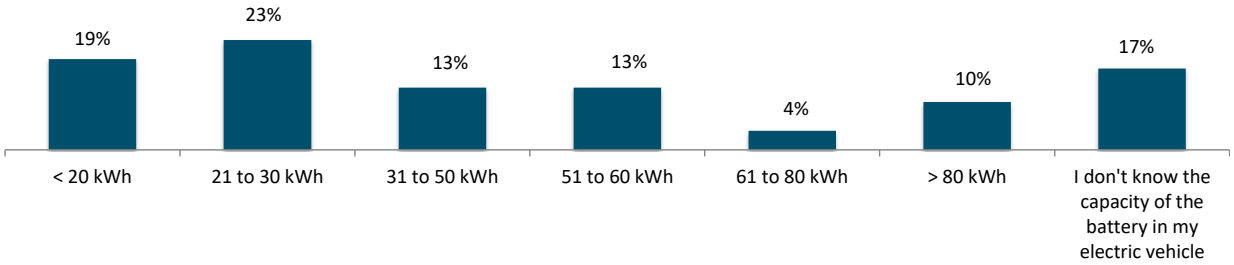
- A total of 3950 individuals were sent an invitation to participate in the study.
- 211 completed the survey, resulting in a response rate of 5%.
- The study was distributed by the Ministry of Energy and VEVA.
- The survey was online from April 4 to May 18, 2018.
- As this is an online survey, margin of error stats are not calculated.

BC Hydro
Power smart

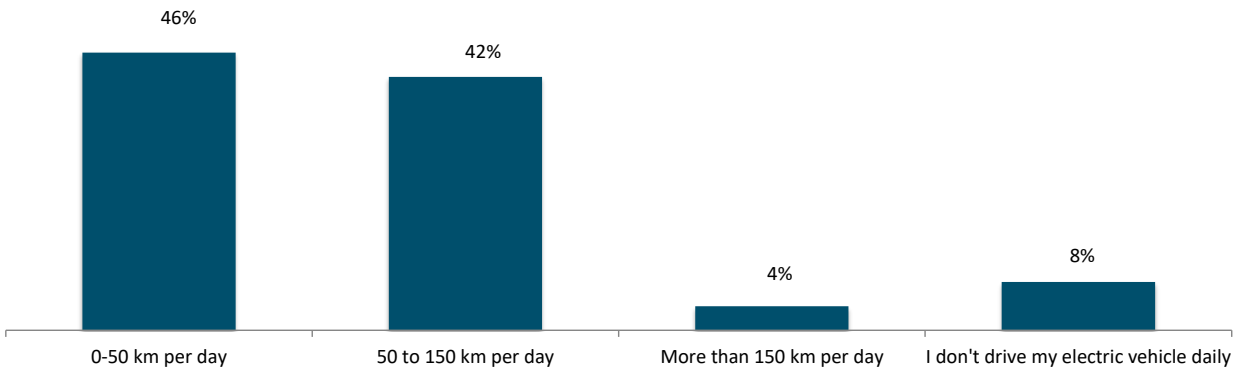
Key Insights

- Almost one-half of customers have never used a DC Fast Charger.
  - Reasons for this include charging stations not being conveniently located or battery is fully charged when leaving home and trips are planned accordingly.
  - Of those that have used a DC Fast Charger, most spend less than 1 hour charging and use either free chargers or pay by kWh.
  - Most popular reasons for using DC Fast Chargers include “it is significantly faster than charging at a Level 1 or 2 station,” “need to gain range on longer trips,” “free charging” and “conveniently located.”
- The overwhelming majority would prefer to pay “by kWh” as opposed to paying “by time.”
- 6 in 10 customers use Level 2 (240v) chargers, the remaining use Level 1 (120v) outlets.
- Of those customers that charge at home, almost half plug into a regular Level 1 (120v) plug.
- One-half of customers have a phone app to manage their charging needs. Of these, most are notified when their car is finished charging.
- 8 in 10 of those surveyed were men.
- Most customers were interested in more follow-up research on Electric Vehicles.
- Three quarters of those surveyed live in a single detached home.
- Just over 60% of those that participated in the survey are employed full-time.
- A significant number surveyed fall the very high income bracket.
- 6 and 10 the EV owners surveyed have a university degree.

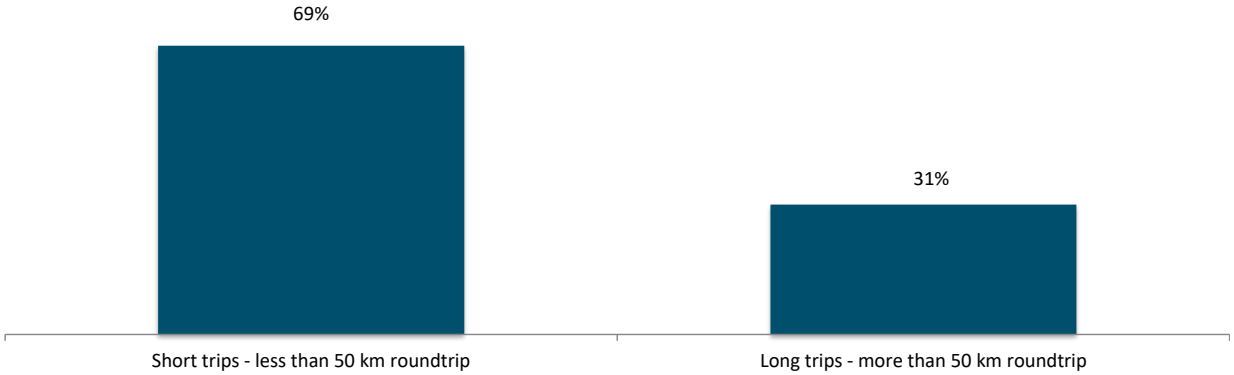
What is the capacity of the battery in your primary electric vehicle?



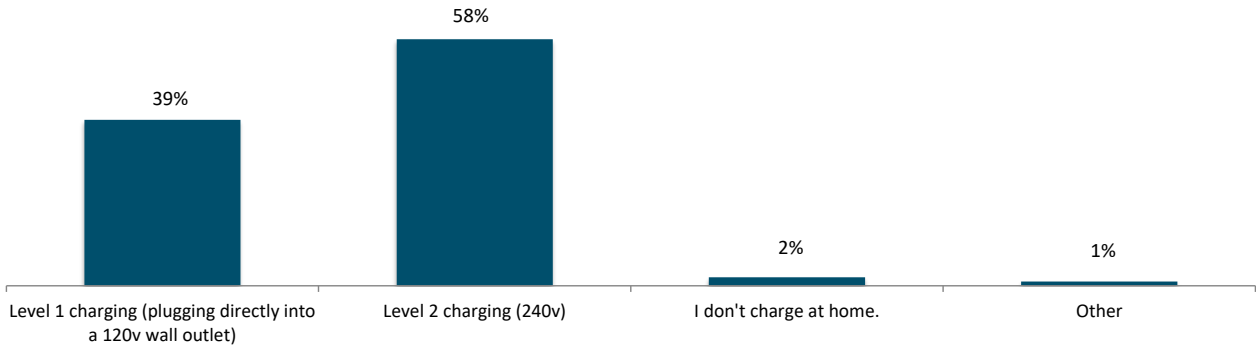
How many kilometers per day do you typically travel?



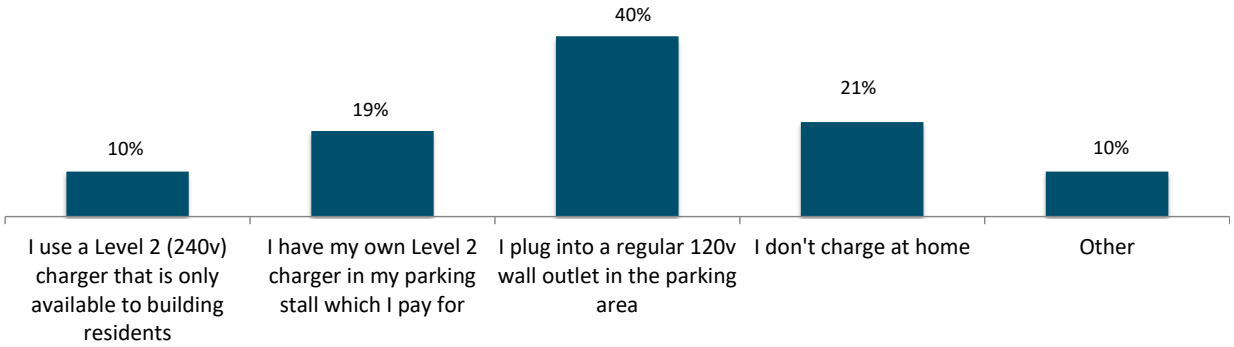
When you do drive your car, typically how long are your trips?



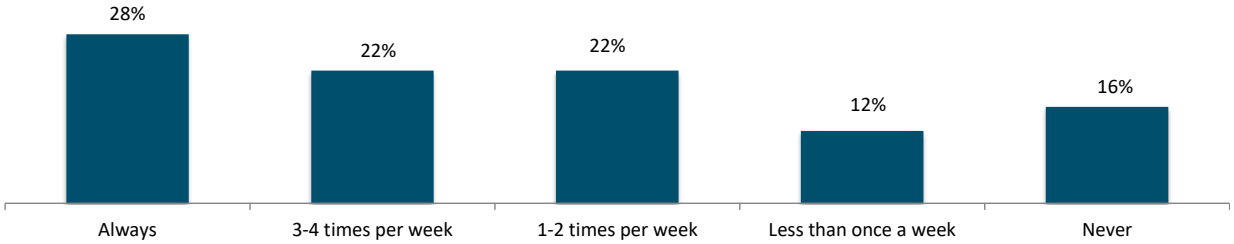
When you charge your car at home, what kind of charging do you do?



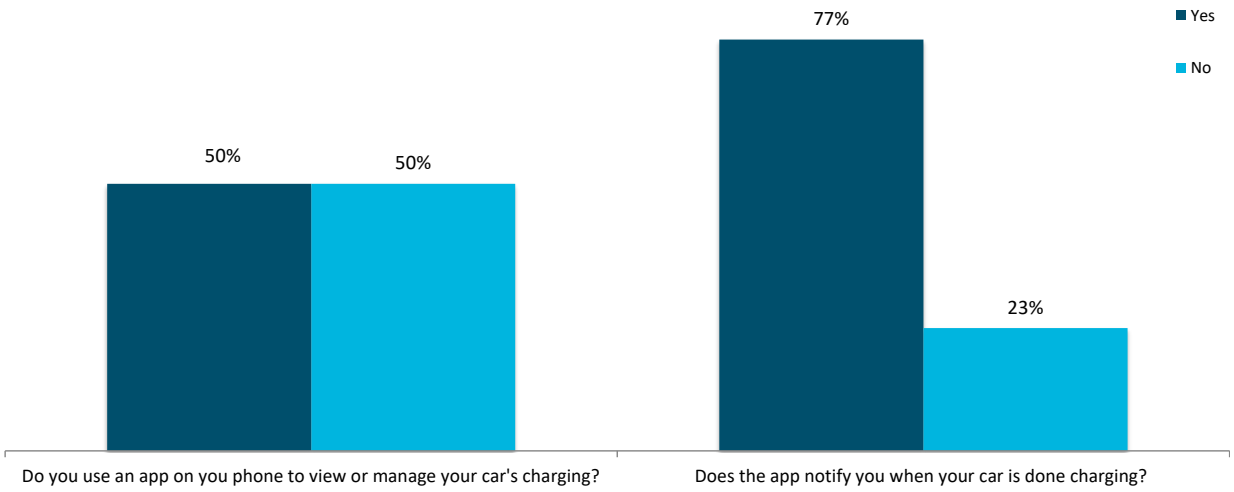
When you charge your car at home, what kind of charging do you do? (Single detached house)



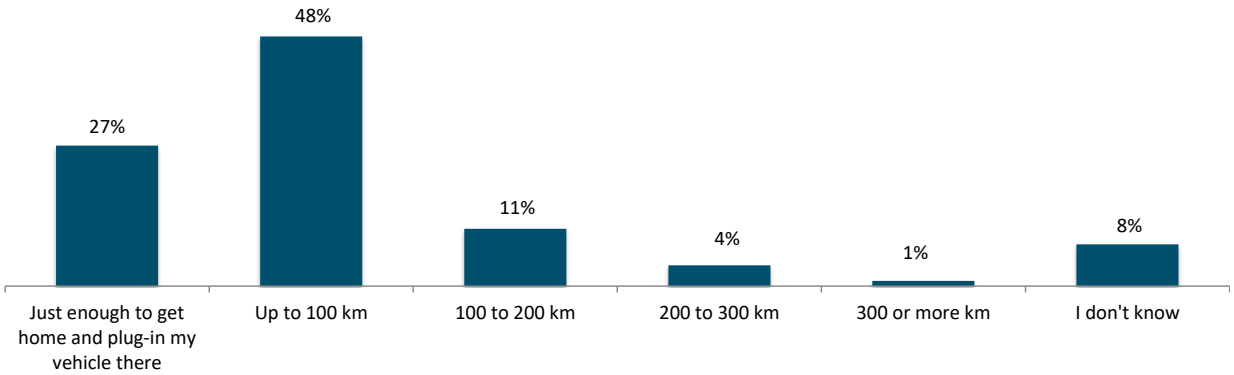
In the winter, on average, how frequently do you charge your electric vehicle between 4 p.m. and 9 p.m. on weekdays in your household?



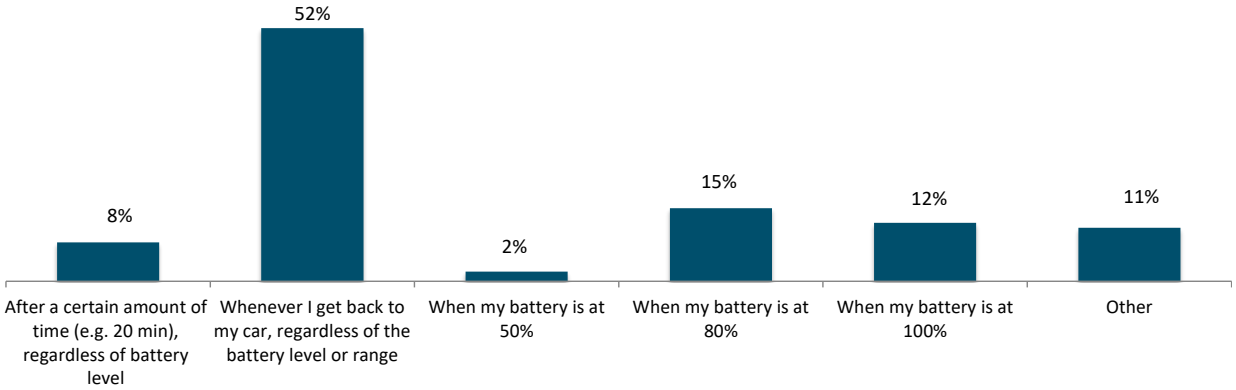
Use of an app


Yes
No
50%
50%
77%
23%
Do you use an app on you phone to view or manage your car's charging?
Does the app notify you when your car is done charging?

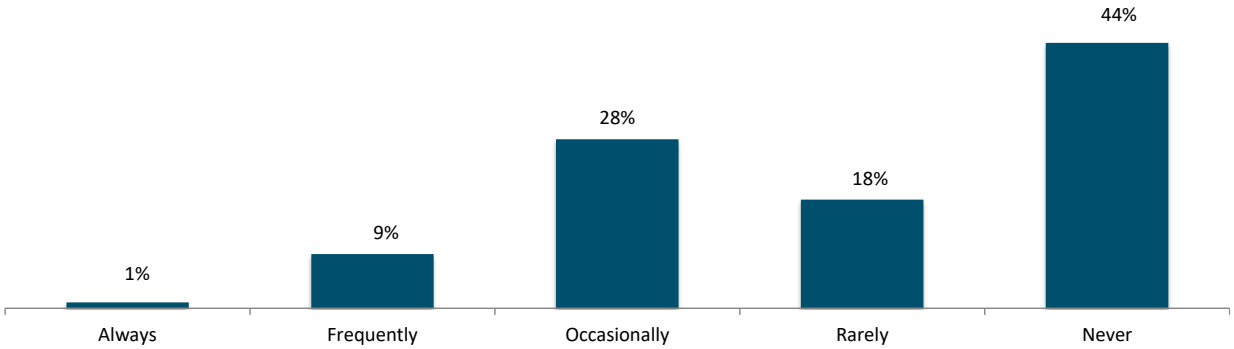
How much range do you typically gain in a charge at a public charging station?



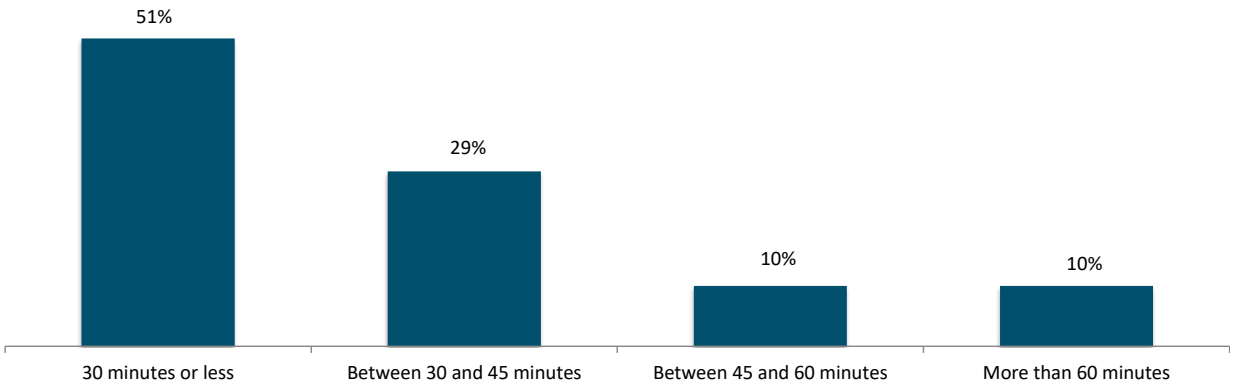
At what point do you typically stop charging?



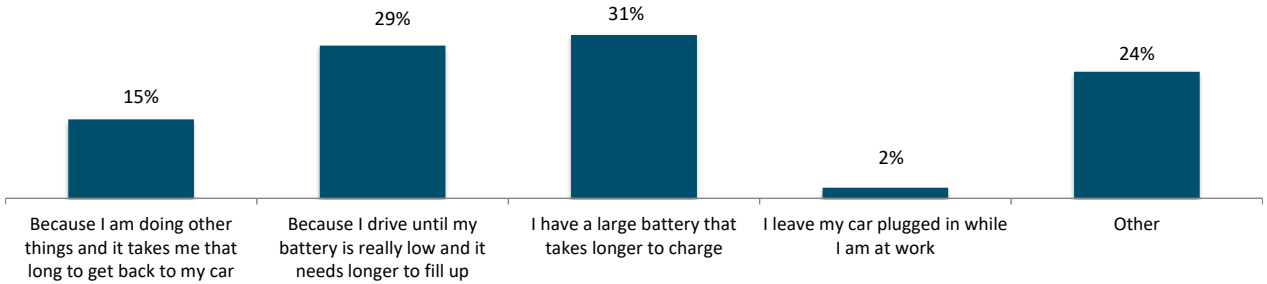
Do you ever use DC Fast Charging stations?



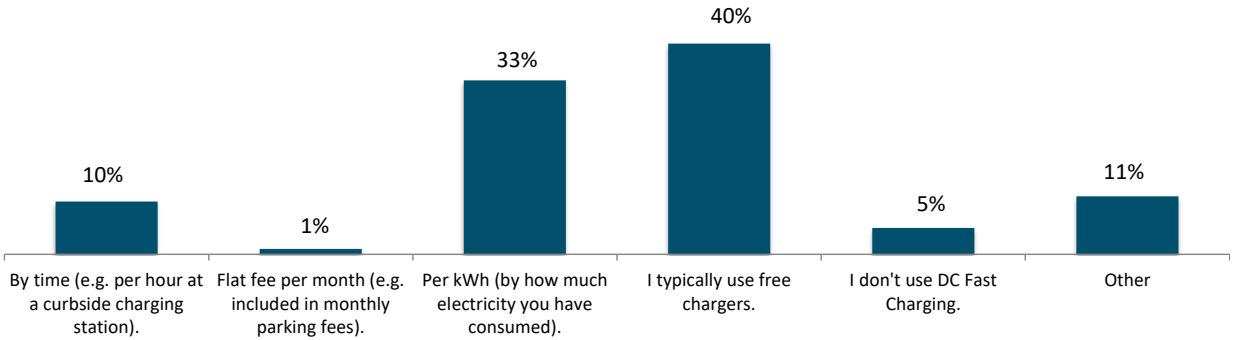
How much time do you usually spend charging at a DC Fast Charging station?



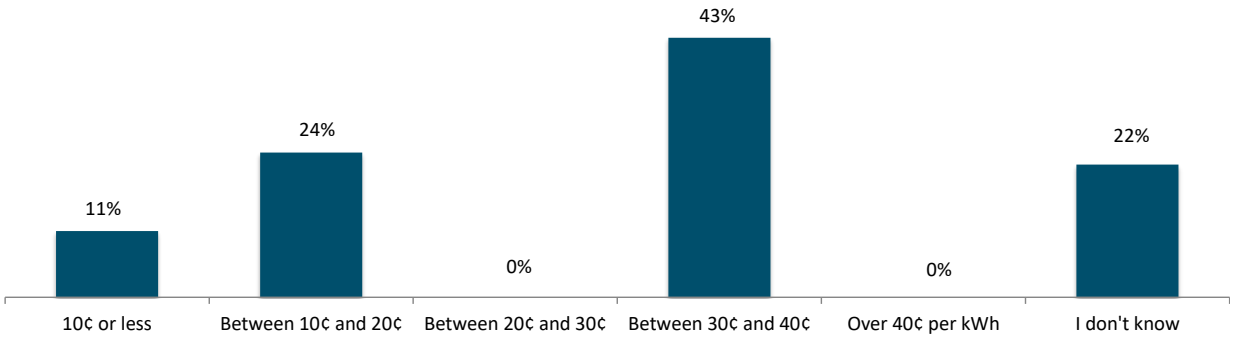
Why do you spend this much time at the station?



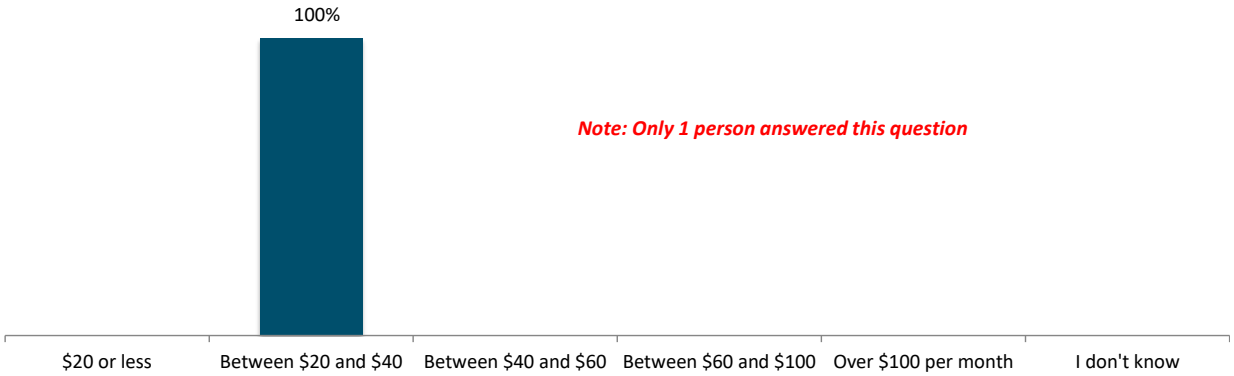
When you charge your car at a DC Fast Charging station, how do you most often pay for the electricity you consume? (n=112)



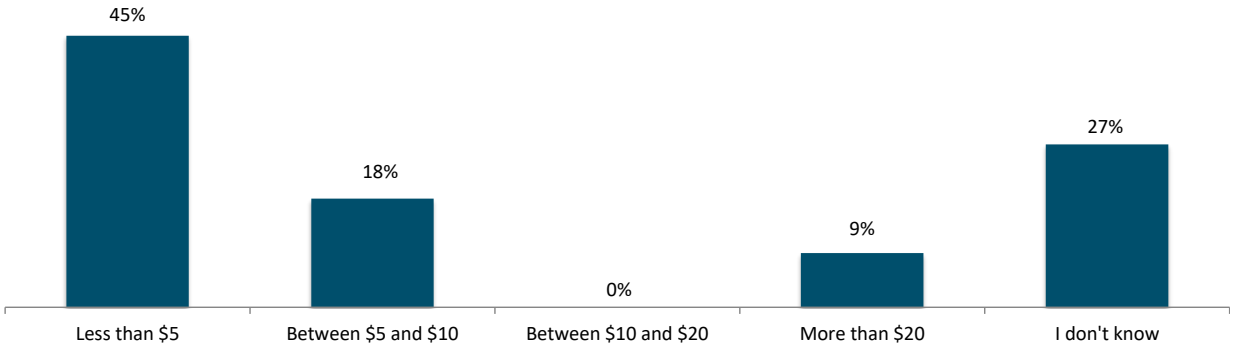
On average, how much do you typically pay per kWh? (n=37)



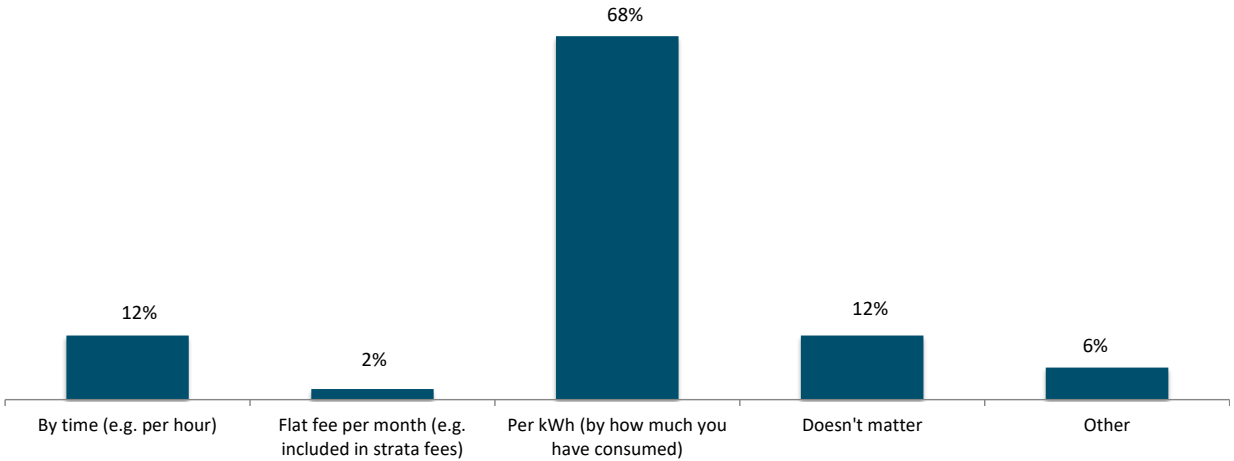
On average, how much do you typically pay per month for the charging, not including the cost of parking? (n=1)



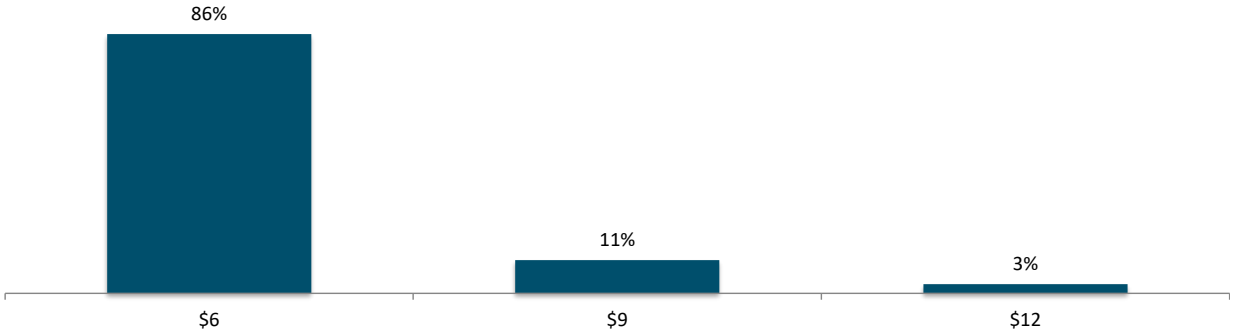
On average, how much do you typically pay per hour? (n=11)



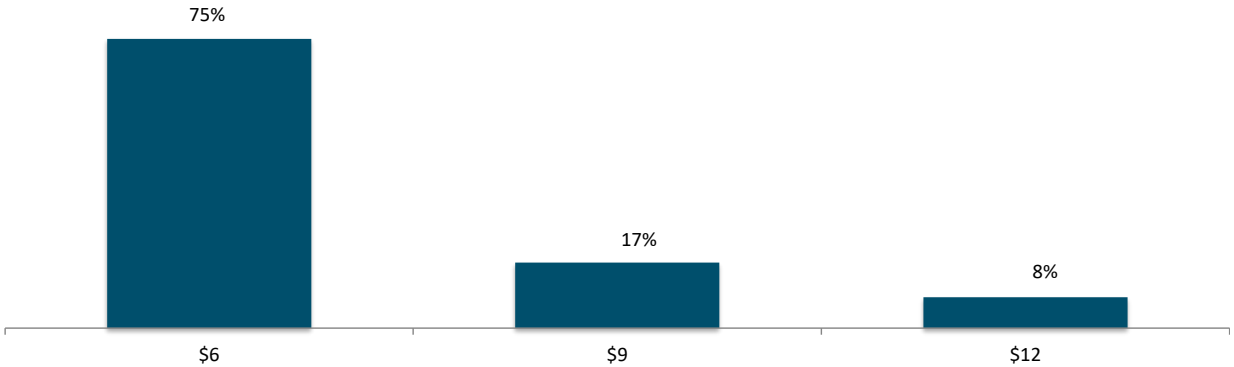
How would you prefer to pay for the electricity you consume if and when you use a DC Fast Charging station? (n=112)



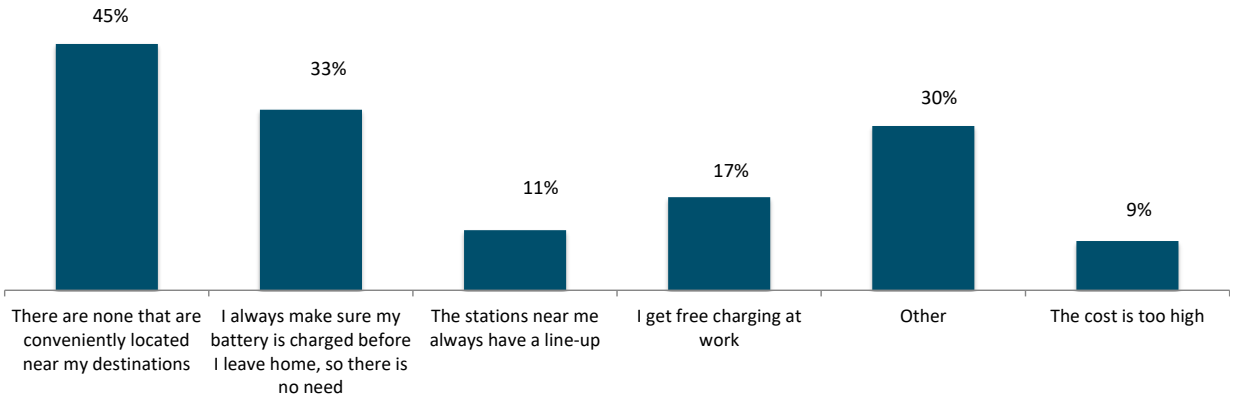
You leave your home on Saturday morning to run some errands in your electric vehicle. You have a lot to do, and after a few hours you realize your battery is **getting low. You have enough charge to get home if you need to, but you won't be** able to finish your errands if you do that. You know that there is a DC Fast Charging station nearby that you can use and then you can finish your errands. Would you be willing to pay $[variable] per 30 minutes to charge your car at a 50 kW charging station instead of going home?



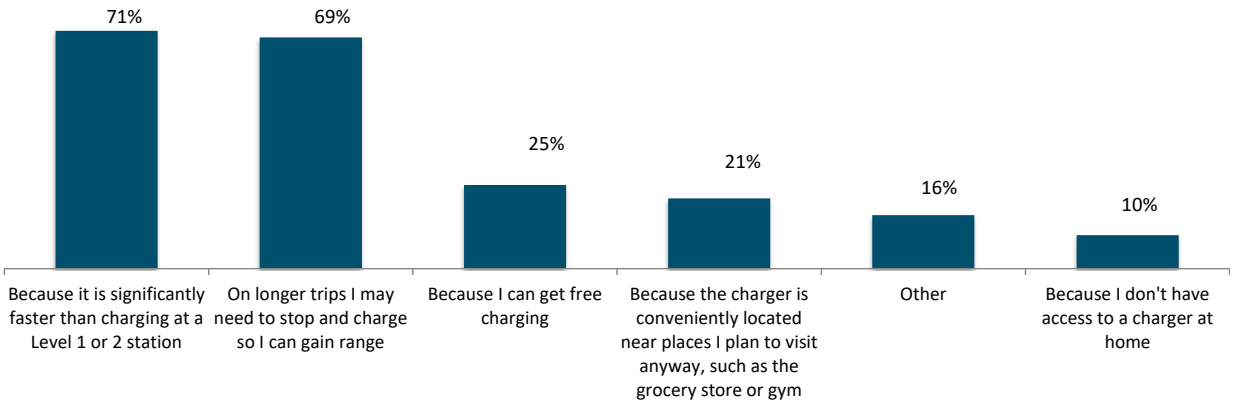
You are on a road trip in your electric vehicle, when you approach a DC Fast Charging station off the highway. You probably have enough charge to reach the **next station, but you'd feel more comfortable if you charged your battery before** continuing on the highway. Would you be willing to pay $[variable] per 30 minutes to charge your car at a 50 kW charging station instead of continuing on to the next stations?



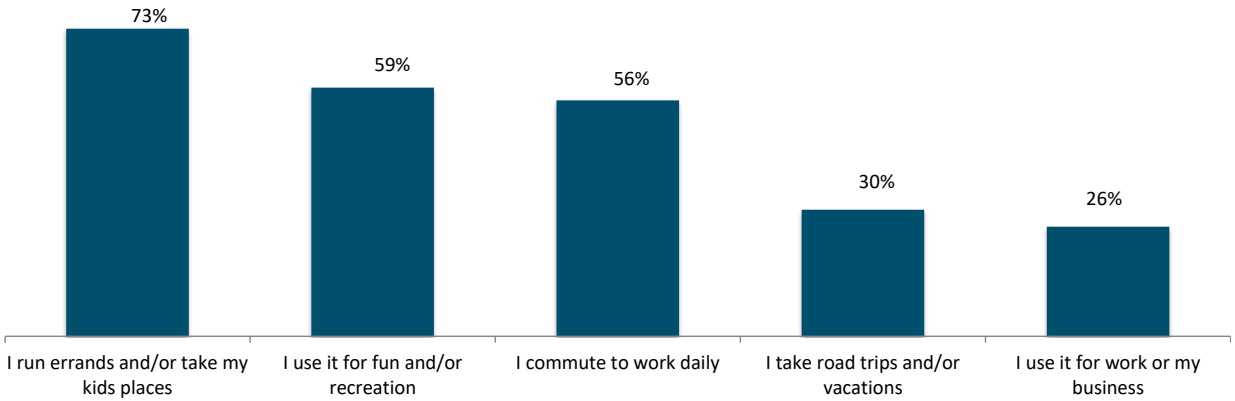
Why don't you use public charging stations? (n=88)



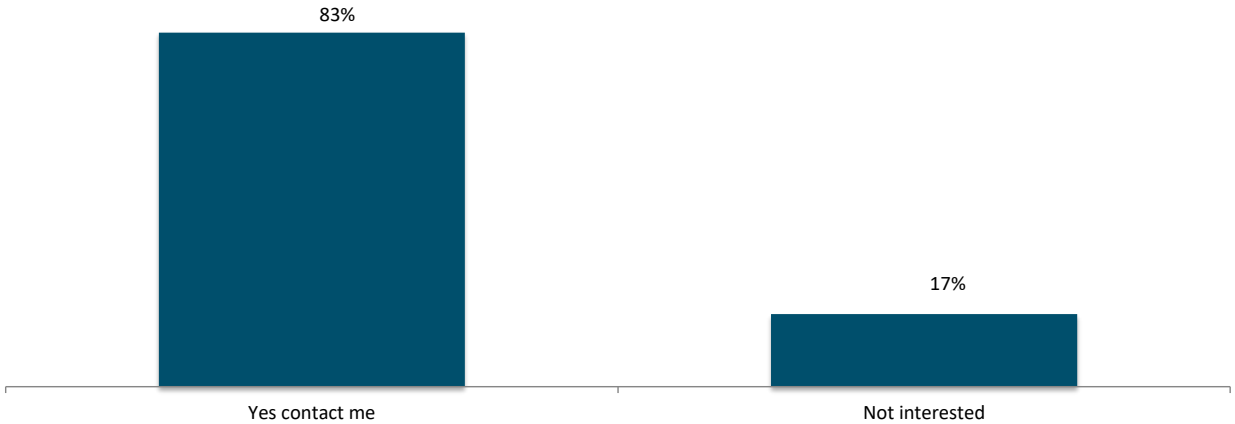
Why do you use DC Fast Charging stations?



What type of driving do you do in your EV?

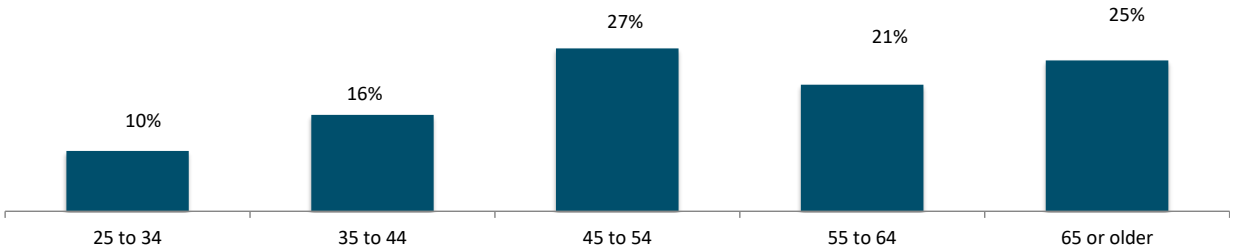


Would like to participate in future research on electric vehicles....

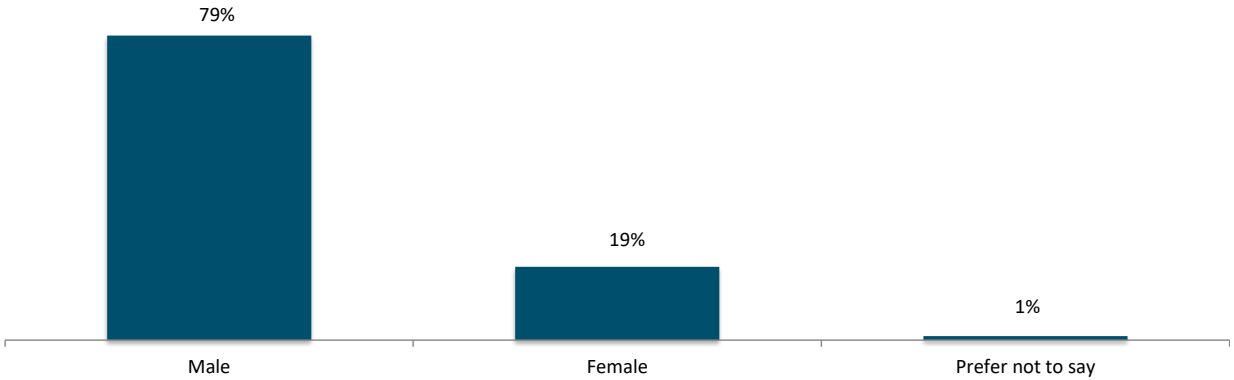


Demographics

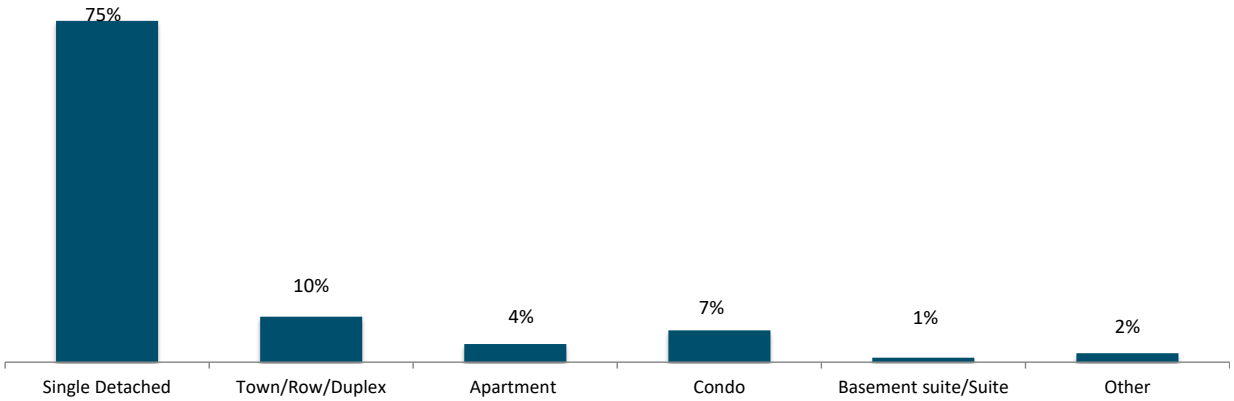
Age



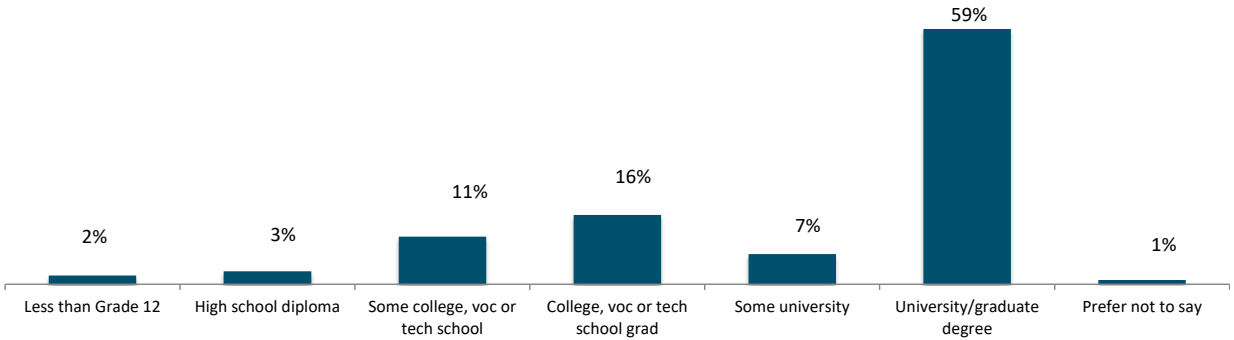
Gender



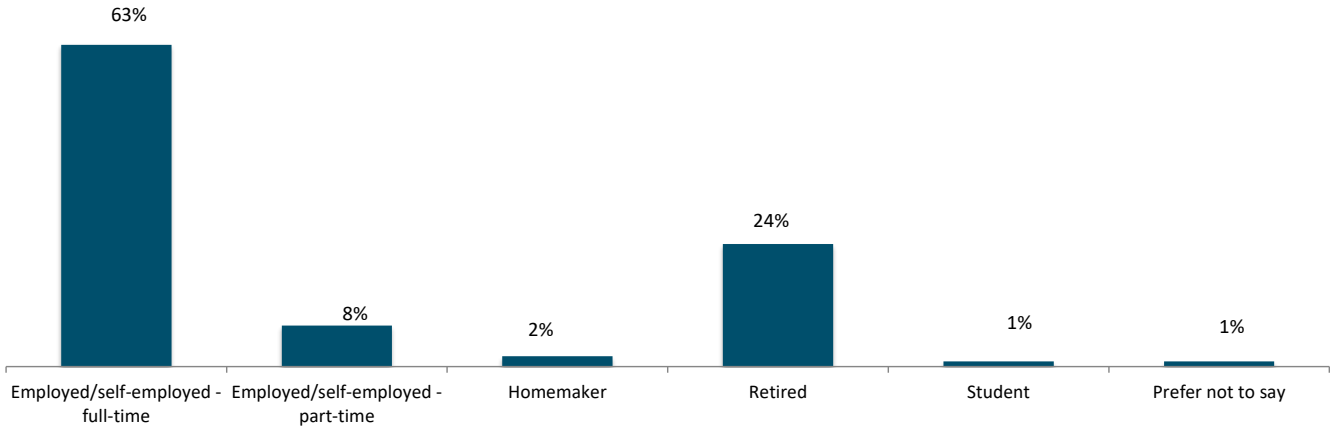
Which of the following best describes your home?



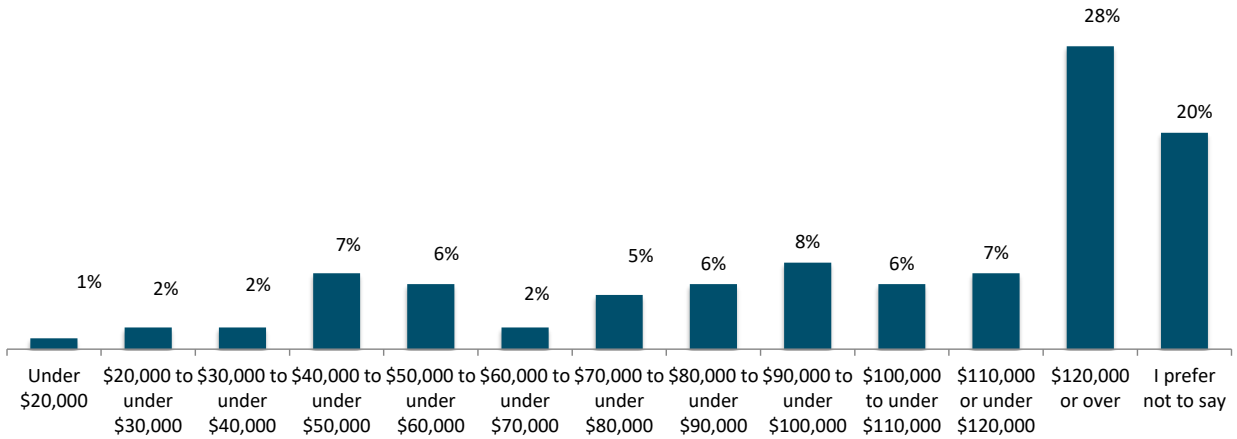
Education


2%
3%
11%
16%
7%
59%
1%
Less than Grade 12
High school diploma
Some college, voc or tech school
College, voc or tech school grad
Some university
University/graduate degree
Prefer not to say

Employment


63%
8%
2%
24%
1%
1%
Employed/self-employed - full-time
Employed/self-employed - part-time
Homemaker
Retired
Student
Prefer not to say

Income


1%
2%
2%
7%
6%
2%
5%
6%
8%
6%
7%
28%
20%
Under $20,000
$20,000 to under $30,000
$30,000 to under $40,000
$40,000 to under $50,000
$50,000 to under $60,000
$60,000 to under $70,000
$70,000 to under $80,000
$80,000 to under $90,000
$90,000 to under $100,000
$100,000 to under $110,000
$110,000 or under $120,000
$120,000 or over
I prefer not to say


BC Hydro
Power smart

4.0 B. STAKEHOLDER ENGAGEMENT

Reference: RATE DESIGN
Exhibit B-1, Section 3.1, pp. 14–15, 18, Appendix D
Survey

On page 15, BC Hydro notes that 59 percent of respondents indicate it is reasonable to charge a rate for the use of a public fast charging station. 34 percent of respondents indicate public charging service is criterial to them and they have nowhere else to charge.

1.4.3 To the extent possible, please compare the 2020 survey against past survey findings regarding customer reliance on BC Hydro public EV charging stations as their only option. Are customers more or less reliant on public EV charging infrastructure?

RESPONSE:

Past surveys that BC Hydro conducted regarding the public fast charging service include a 2019 BC Hydro public charging customer support satisfaction survey and a 2018 DC Fast Charger online survey. The 2019 survey questions were not asked related to "customer reliance on BC Hydro public EV charging stations as their only option."

The 2018 online survey indicated that almost one-half of customers have never used a DC Fast Charger. Reasons for this include charging stations not being conveniently located or battery is fully charged when leaving home and trips are planned accordingly.

Please refer to BC Hydro's response to BCUC IR 1.4.2 for a copy of the report that compares the 2020 and 2019 satisfaction surveys and a copy of 2018 DC Fast Charger online survey results.

4.0 B. STAKEHOLDER ENGAGEMENT

Reference: RATE DESIGN
Exhibit B-1, Section 3.1, pp. 14–15, 18, Appendix D
Survey

On page 18, BC Hydro notes that respondents would like discounted rates for users of fast charging stations who are also a BC Hydro Residential or Commercial Service customer. Some respondents would like BC Hydro to add the amount billed for fast charging to their Residential Service bills.

1.4.4 Please discuss the feasibility and potential justifications to provide discounted rates for EV fast charging customers who are also BC Hydro Residential or Commercial Service customers.

RESPONSE:

At this time, BC Hydro is not proposing to provide a discounted rate for fast charging customers who are also BC Hydro Residential or Commercial Service customers and is unable conclude whether it would be feasible or justified.

Standard rate design principles, and prior BCUC decisions, require electric utility rates to have an economic or cost of service basis. In order to determine whether such a justification exists, BC Hydro would have to conduct analysis of costs and revenues. In order to determine whether or not such a discount would be feasible, BC Hydro would have to develop a potential implementation plan and cost estimate.

4.0 B. STAKEHOLDER ENGAGEMENT

Reference: RATE DESIGN
Exhibit B-1, Section 3.1, pp. 14–15, 18, Appendix D
Survey

On page 18, BC Hydro notes that respondents would like discounted rates for users of fast charging stations who are also a BC Hydro Residential or Commercial Service customer. Some respondents would like BC Hydro to add the amount billed for fast charging to their Residential Service bills.

1.4.5 Please discuss the feasibility and administrative costs or savings for BC Hydro to add the amount billed for fast charging to a Residential Service customers' bills.

RESPONSE:

At this time, there are a number of barriers to adding the amount billed for electric vehicle fast charging service to a Residential Service Customer bill, although this concept is something that BC Hydro may further explore in future.

The current primary barrier is related to billing system limitations because the billing system for fast charging service is entirely separate from the billing system for Residential Service. At this time there is no integration between these systems and no way to add the fast charging service bill to a Residential Service bill without extraordinary manual and labour intensive steps.

Linking public electric vehicle fast charging billing systems with BC Hydro's Residential Service billing system in SAP is expected to be cost prohibitive for many years to come. To the best of BC Hydro's knowledge, no public utility in North America has implemented such a billing scheme.

4.0 B. STAKEHOLDER ENGAGEMENT

Reference: RATE DESIGN
Exhibit B-1, Section 3.1, pp. 14–15, 18, Appendix D
Survey

On page 18, BC Hydro observes the following as one of the key takeaways: "A rate should be low enough to not discourage electric vehicle adoption".

1.4.6 In BC Hydro's view, please explain how the BCUC should consider EV adoption as a factor in setting rates for BC Hydro's public EV fast charging service under section 59 to 61 of the UCA.

RESPONSE:

The BCUC must set a rate for the regulated public electric vehicle fast charging service provided by BC Hydro.

When setting rates under section 60 of the *Utilities Commission Act*, the BCUC "must consider all matters that it considers proper and relevant affecting the rate". Electric vehicle adoption is one of the matters currently relevant to the rate for the electric vehicle fast charging service and may be considered by the BCUC, as evidenced by:

- **Table 3 of the Application, in which BC Hydro demonstrates the different scenarios of station utilization rates and cost recovery. (It can be reasonably assumed that station utilization rate corresponds with electric vehicle adoption rate);**
- **The survey results discussed in section 3.1 of the Application ("Respondents who support a rate shared their thoughts about the ideal price point, which they indicate should be low enough to encourage electric vehicle adoption"); and**
- **The statement on page 6 of the Rocky Mountain Institute report (link provided on page 31 of the Application) that "while EV adoption is still in its early days and utilization rates on public DCFCs are low, costs must be low enough to encourage charging station operators to continue to deploy more public charging stations."**

5.0 C. RATE DESIGN

Reference: RATE DESIGN
Exhibit B-1, Sections 2.1, 2.2, pp. 10–12, Section 3.3, p. 22, Section 7, p. 40, Section 4.4, Table 4, p. 35; Exhibit E-46, p. 2
Energy-based vs. Time-based Metering

On page 10 of the Application, BC Hydro states:

> The time required to charge an electric vehicle is dependent on the vehicle battery size, battery charge level when fast charging commences, and the outdoor air temperature.

In Table 4 on page 35 of the Application, BC Hydro states:

> A per-minute-based rate benefits customers with larger battery size and is a disadvantage to customers with smaller battery size relative to a per kWh charge.

1.5.1 Please discuss the alternatives that BC Hydro have considered to address the issue that a per-minute-based rate would be preferential to customers with larger battery sizes relative to a per kWh charge. If alternatives were not considered, please explain why not.

RESPONSE:

BC Hydro acknowledges that an electricity-based rate would improve fairness across customers with different battery sizes, relative to a time-based rate. BC Hydro considered an electricity-based rate (i.e., $/kWh and/or per kW) for the service; however, as described in section 2.2 of the Application, such rates are not feasible at this time due to metering limitations.

As described in section 5 of the Application, BC Hydro will monitor technological advancements in metering and billing for fast charging services and address changes as part of our 2024 evaluation.

5.0 C. RATE DESIGN

Reference: RATE DESIGN
Exhibit B-1, Sections 2.1, 2.2, pp. 10–12, Section 3.3, p. 22, Section 7, p. 40, Section 4.4, Table 4, p. 35; Exhibit E-46, p. 2
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In Table 4 on page 35 of the Application, BC Hydro states:

> A per-minute-based rate benefits customers with larger battery size and is a disadvantage to customers with smaller battery size relative to a per kWh charge.

1.5.2 Please confirm, or explain otherwise, that the rate at which an EV battery charges is non-linear. For example, an EV with near 0% battery level would likely receive 50 kWh of energy if it charges at a 50 kW station for one hour. However, an EV with at around 50% battery level would likely receive less than 50 kWh of energy if it charges at a 50 kW station for one hour because the rate of charge slows down as the battery fills.

RESPONSE:

Confirmed. In most cases, the rate at which an EV battery charges is non-linear and the rate of charging reduces as the battery state of charge increases. The size of the battery and on-board battery conditioning are also a key factors in determining the rate of charge at a fast charging station. EV batteries that are in the 50 to 100kWh range could charge close to 50kW even when the battery is at a higher state of charge (i.e., over 50 per cent).

5.0 C. RATE DESIGN

Reference: RATE DESIGN
Exhibit B-1, Sections 2.1, 2.2, pp. 10–12, Section 3.3, p. 22, Section 7, p. 40, Section 4.4, Table 4, p. 35; Exhibit E-46, p. 2
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In Table 4 on page 35 of the Application, BC Hydro states:

> A per-minute-based rate benefits customers with larger battery size and is a disadvantage to customers with smaller battery size relative to a per kWh charge.

1.5.3 Please elaborate on how air temperature affects the time required to charge an EV, for a given amount of electricity. If temperature plays a factor, how wide is the time variance? Are DCFC stations equipment standardized to ensure that the charging rate is consistent under different air temperatures?

RESPONSE:

Temperature affects the EV battery chemistry which in turn impacts the rate at which an EV battery will charge. However, air temperature does not impact all electric vehicles equally and the variance can be high in some cases. Some have on-board liquid cooling and heating systems for the battery (battery conditioning) that provide a more consistent rate of charging. As vehicle and battery technologies improve, the variance is expected to reduce over time.

Fast charging stations do not manage the rate of charging for different air temperatures given this is governed by various battery chemistries and the vehicle itself.

5.0 C. RATE DESIGN

Reference: RATE DESIGN
Exhibit B-1, Sections 2.1, 2.2, pp. 10–12, Section 3.3, p. 22, Section 7, p. 40, Section 4.4, Table 4, p. 35; Exhibit E-46, p. 2
Energy-based vs. Time-based Metering

On page 10 of the Application, BC Hydro states:

> The time required to charge an electric vehicle is dependent on the vehicle battery size, battery charge level when fast charging commences, and the outdoor air temperature.

In Table 4 on page 35 of the Application, BC Hydro states:

> A per-minute-based rate benefits customers with larger battery size and is a disadvantage to customers with smaller battery size relative to a per kWh charge.

1.5.4 Please discuss whether an electricity-based rate would improve the fairness in the fee structure. Why or why not?

RESPONSE:

BC Hydro considers that an electricity-based rate could better reflect the cost of service, relative to a time-based rate, and as such it could improve fairness. However, as discussed in section 2.2 of the Application, an electricity-based rate is not possible at this time due to metering limitation.

5.0 C. RATE DESIGN

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> Although customer and stakeholder support for an electricity-based or a combination electricity-and-time-based rate was expressed during BC Hydro's public and stakeholder consultations as discussed in section 3 below, only a time-based rate is possible at this time due to the lack of a Measurement Canadian approved standard to measure direct current (**DC**) power. While the electricity provided to the fast charging station, including the charging equipment, lighting and ancillary equipment (e.g., heating and cooling), can be metered with current Measurement Canada approved revenue metering equipment, there is no Measurement Canada approved solution measuring the electricity dispensed from the station to the battery of the electric vehicle. [Emphasis retained]

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Session end date: 2021-04-05 12:55:56
Energy used: 19.5980 kWh
Session duration: 32m 06s
Session cost: $0.00 (CAD)
BC PST 7%
PST-1000-4701 $0.00 (CAD)
BC GST 5%
813762895RT0001 $0.00 (CAD)
Total cost: $0.00 (CAD)
New card balance: $0.00 (CAD)

Questions? Reach us at evsupport@bchydro.com

1.5.5 Please confirm, or explain otherwise, that the amount of electricity dispensed from the charging station and into battery of the EV is metered.

RESPONSE:

The electricity dispensed from the charging station and into the battery of an electric vehicle is measured by an embedded metering device in the charging station. This embedded metering device and associated software, however, cannot be used for billing purposes at this time given Measurement Canada has not adopted an industry standard for DC metering. It is provided to the customer for information purposes only.

5.0 C. RATE DESIGN

Reference: RATE DESIGN
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1.5.5 Please confirm, or explain otherwise, that the amount of electricity dispensed from the charging station and into battery of the EV is metered.

1.5.5.1 If confirmed, please explain whether this information could be used to develop an electricity-based rate.

RESPONSE:

This information could be used to develop an electricity-base rate once a Measurement Canada approved industry standard is in place, if the meter providing the information meets the requirements of the prospective Measurement Canada standard.

5.0 C. RATE DESIGN

Reference: RATE DESIGN
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1.5.6 Please discuss whether BC Hydro ever experienced any customer complaints regarding the accuracy of the energy used line item. If so, how many complaints were related to this issue and how did BC Hydro address these complaints? If not, what is BC Hydro's

protocol to resolve such complaints should they arise in the future?

RESPONSE:

BC Hydro has not recorded any complaints related to the accuracy of the "Energy used" line item in the post Charging Session receipt.

When such a compliant is received, BC Hydro will investigate future kWh complaints/discrepancies as it does with any other public EV fast charging support call/complaint that has been escalated. When necessary and possible, a Field Service Representative will also be dispatched to perform a test charge in an attempt to replicate the issue. Furthermore, BC Hydro will engage the station/charger manufacturers for additional expertise and analysis to determine if the discrepancy issue is occurring at a specific charger or on a specific vehicle make/model. Based on this investigation, our electrical contractors may also be engaged for closer inspection and/or repair to resolve the issue.

5.0 C. RATE DESIGN

Reference: RATE DESIGN
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1.5.7 Please discuss the pros and cons of charging an electricity-based rate despite the lack of a Measurement Canada approved standard.

RESPONSE:

An electricity-based rate may have the following pros:

- **The customers will pay for each charging session based on the electricity dispensed to electric vehicles, without the influence of the factors such as the battery capacity prior to charging, battery size and other unique manufacturer equipment characteristics;**
- **Rate based on cents per kWh energy consumed and dollars per kW of peak demand are universally accepted for electricity delivery; and**
- **The customers are only charged for electricity consumed at point of energy delivered to the electric vehicle load, which is consistent with how electricity is being delivered by BC Hydro and other utilities and thus will be more familiar to the customers.**

However, as explained in section 2.2 of the Application, it is not possible today for have an electricity-based rate due to the lack of a Measurement Canada accepted standard for DC metering. Besides the costs expected for potential hardware and software upgrades to the currently deployed fast charging stations to support the new standard, BC Hydro currently does not have any information or data to know or assess any potential issues associated with implementing an electricity-based rate under a new standard for metering.

5.0 C. RATE DESIGN

Reference: RATE DESIGN
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1.5.8 If BC Hydro could bill on a per-kWh basis, what would these per-minute rates translate into, all other things equal?

RESPONSE:

All other things being equal, the per-minute Proposed Rates would translate to the following per-kWh bases rates, utilizing the formula:

> **[(proposed rate) x (average charging session length)] / average electricity consumption per charging session**

Fast Charging Station (kW)	Proposed Rate (Cents per Minute)	Average Charging Session Length[1] (Minutes)	Average Electricity Consumption per Charging Session[1] (kWh)	Translated energy-based rate[1] (Cents per kWh)
50	21	28.6	13.1	46
100	27			59
25	12			26

1. **Energy-based rate is determined based on 50 kW station data collected from BC Hydro's fast charging stations from April 1, 2019 to March 31, 2020 as shown in Exhibit B-1 (Page 29). Data is extrapolated to calculate 100 kW and 25 kW values.**

5.0 C. RATE DESIGN

Reference: RATE DESIGN
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1.5.9 Please discuss whether implementing an electricity-based rate without a Measurement Canada approved standard would violate

section 9 of the Electricity and Gas Inspection Act[1]. If so, please discuss the implications to BC Hydro and its customers of violating section 9 of the Electricity and Gas Inspection Act.

RESPONSE:

An analysis of whether an entity would be subject to the requirement of a particular legislation needs to be done by that entity. There are several provisions under the *Electricity and Gas Inspection Act* (EGIA) and also the *Weights and Measures Act* that are applicable to metering devices and measuring units, including section 9(1) of the EGIA:

> **Subject to subsections (2) and (3), where a contractor or purchaser intends to use or cause to be used a meter for the purpose of obtaining the basis of a charge for electricity or gas supplied by or to him, the meter shall not, until it has been verified and sealed in accordance with this Act and the regulations, be put into service.**

Thus, in BC Hydro's view, implementing an electricity-based rate for electric vehicle fast charging service without a Measurement Canada verified and sealed meter could be a violation of the above section, unless a temporary or permanent dispensation is granted. BC Hydro does not have such dispensation. BC Hydro does not believe seeking such dispensation is appropriate in this instance considering that the Measurement Canada is developing performance-based requirements that would allow EV owners to purchase a charge based on the amount of electricity consumed. However, a dispensation remains an option in future based on further discussion with Measurement Canada.

[1] Electricity and Gas Inspection Act, R.S.C., 1985, c. E-4.

5.0 C. RATE DESIGN

Reference: RATE DESIGN
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1.5.9.1 Is compliance to the Electricity and Gas Inspection Act different for a public utility such as BC Hydro and an entity that would otherwise not be a public utility (e.g. Shell/Greenlots)?

RESPONSE:

BC Hydro understands that the *Electricity and Gas Inspection Act* applies to a public utility and any other entities that intend to sell electricity or gas as shown by the following sections as an example:

> **6 *(2)* No contractor shall sell electricity or gas on the basis of measurement unless he holds a certificate of registration issued under the authority of this subsection in respect of the supply of electricity or gas, as the case may be.**
>
> **9 *(1)* Subject to subsections (2) and (3), where a contractor or purchaser intends to use or cause to be used a meter for the purpose of obtaining the basis of a charge for electricity or gas supplied by or to him, the meter shall not, until it has been verified and sealed in accordance with this Act and the regulations, be put into service.**

5.0 C. RATE DESIGN

Reference: RATE DESIGN
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1.5.10 Please discuss whether the lack of Measurement Canada approved standard is the only reason that an electricity-based rate is not possible at this time.

RESPONSE:

In addition to the lack of a Measurement Canada approved standard for DC metering, there are two reasons electricity-based rates for fast charging service are not possible at this time:

1. **The BC Hydro EV network billing platform software developed by AddEnergie Technologies is currently not able to bill by kWh or combination of kWh + time for a fast charging station (i.e., a station capable of charging electric vehicle using a direct current). AddEnergie Technologies is targeting to have this capability available in the EV network billing platform by April 2022, subject to a Measurement Canada standard specification; and**

2. **BC Hydro-owned fast charging stations from AddEnergie Technologies or ABB manufactured chargers have not had their onboard kWh measurement validated or tested for accuracy given there is no Measurement Canada standard to validate against.**

5.0 C. RATE DESIGN

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1.5.10 Please discuss whether the lack of Measurement Canada approved standard is the only reason that an electricity-based rate is not possible at this time.

1.5.10.1 If not, please identify the other factors that are preventing BC Hydro from offering an electricity-based rate.

RESPONSE:

Please refer to BC Hydro's response to BCUC IR 1.5.10.

5.0 C. RATE DESIGN

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1.5.11 Please confirm, or explain otherwise, that the energy delivered to the charging station is in alternating current (AC).

RESPONSE:

Confirmed. A charging station is supplied from BC Hydro alternating current (AC) system (three-phase at 208 V or 600 V or single phase at 208 V). For clarity, an electric vehicle is charged using direct current (DC) at a fast charging station.

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1.5.11.1 Since the electricity provided to the fast charging station can be metered with current Measurement Canada approved revenue metering equipment, please discuss whether it would be possible to charge an electricity-based rate based on the energy delivered to the charging equipment.

RESPONSE:

There are two primary reasons why it is not possible to use a Measurement Canada approved revenue meter currently installed at a fast charging station for the purposes of metering electricity dispensed to an electric vehicle and for charging an electricity-based rate:

- **The revenue meter installed at a fast charging station measures the total energy delivered to the charging station(s) installed at a site. The total load includes auxiliary load associated with AC-to-DC transformation and lighting and heating loads in addition to the actual energy dispensed from the fast charging station to the electric vehicle. Thus, even though the installed revenue meter is Measurement Canada approved, the meter is measuring additional load that is incremental to the electric vehicle charging load; and**

- **The metering system currently used by BC Hydro is designed to register the value of the consumption on a daily basis (i.e., a centralized metering system), which then accumulates the daily registered data for the billing period of 30 or 60 days for our billing system. The revenue meter and the associated billing system that are used for billing is not currently designed to accumulate the kWh energy consumed or dispensed in every Charging Session to be synchronized with the start/stop times of electric vehicle charging activity at a fast charging station. To perform bill reconciliation at the metering point for multiple customers at each fast charging station would require a change to the centralized metering system and upgrades to the meter hardware and also to telecommunication and information technology infrastructure to support such metering and also billing.**

5.0 C. RATE DESIGN

Reference: RATE DESIGN
Exhibit B-1, Sections 2.1, 2.2, pp. 10–12, Section 3.3, p. 22, Section 7, p. 40, Section 4.4, Table 4, p. 35; Exhibit E-46, p. 2
Energy-based vs. Time-based Metering

On pages 11 to 12 of the Application, it states that the Proposed Rates are time-based and it further states:

> Although customer and stakeholder support for an electricity-based or a combination electricity-and-time-based rate was expressed during BC Hydro's public and stakeholder consultations as discussed in section 3 below, only a time-based rate is possible at this time due to the lack of a Measurement Canadian approved standard to measure direct current (**DC**) power. While the electricity provided to the fast charging station, including the charging equipment, lighting and ancillary equipment (e.g., heating and cooling), can be metered with current Measurement Canada approved revenue metering equipment, there is no Measurement Canada approved solution measuring the electricity dispensed from the station to the battery of the electric vehicle. [Emphasis retained]

The following is a copy of a receipt for EV charging service at one of BC Hydro's stations provided in the letter of comment in Exhibit E-46:

Your [redacted] card has been charged for the following usage session:

Card identification: [redacted]
Park name: BC Hydro - Revelstoke
Station name: BC1-AB027
Session start date: 2021-04-05 12:23:50
Session end date: 2021-04-05 12:55:56
Energy used: 19.5980 kWh
Session duration: 32m 06s
Session cost: $0.00 (CAD)
BC PST 7%
PST-1000-4701 $0.00 (CAD)
BC GST 5%
813762895RT0001 $0.00 (CAD)
Total cost: $0.00 (CAD)
New card balance: $0.00 (CAD)

Questions? Reach us at evsupport@bchydro.com

1.5.11.1 Since the electricity provided to the fast charging station can be metered with current Measurement Canada approved revenue metering equipment, please discuss whether it would be possible to charge an electricity-based rate based on the energy delivered to the charging equipment.

1.5.11.2 If the mechanism described in the preceding IR is possible, please provide an estimate of the implementation costs and any assumptions used.

RESPONSE:

For the reasons articulated in BC Hydro's response to BCUC IR 1.5.11.1, BC Hydro has not attempted to provide an estimate for implementing the changes and the upgrades potentially required and outlined in that response.

5.0 C. RATE DESIGN

Reference: RATE DESIGN
Exhibit B-1, Sections 2.1, 2.2, pp. 10–12, Section 3.3, p. 22, Section 7, p. 40, Section 4.4, Table 4, p. 35; Exhibit E-46, p. 2
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On pages 11 to 12 of the Application, it states that the Proposed Rates are time-based and it further states:

> Although customer and stakeholder support for an electricity-based or a combination electricity-and-time-based rate was expressed during BC Hydro's public and stakeholder consultations as discussed in section 3 below, only a time-based rate is possible at this time due to the lack of a Measurement Canadian approved standard to measure direct current (**DC**) power. While the electricity provided to the fast charging station, including the charging equipment, lighting and ancillary equipment (e.g., heating and cooling), can be metered with current Measurement Canada approved revenue metering equipment, there is no Measurement Canada approved solution measuring the electricity dispensed from the station to the battery of the electric vehicle. [Emphasis retained]

The following is a copy of a receipt for EV charging service at one of BC Hydro's stations provided in the letter of comment in Exhibit E-46:

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Session duration: 32m 06s
Session cost: $0.00 (CAD)
BC PST 7%
PST-1000-4701 $0.00 (CAD)
BC GST 5%
813762895RT0001 $0.00 (CAD)
Total cost: $0.00 (CAD)
New card balance: $0.00 (CAD)

Questions? Reach us at evsupport@bchydro.com

1.5.12 Section 26 of the *Utilities Commission Act* (UCA) provides that the BCUC may set standards. Please discuss whether there are alternative methods to determine or set reasonable standards for the purposes of measuring the quantity of electricity sold through BC Hydro's EV charging service.

RESPONSE:

Measurement Canada, an agency of Innovation, Science and Economic Development Canada, is responsible for ensuring devices used to measure electricity are accurate. Provincial regulators (e.g., the BCUC) are responsible for establishing the fee customers are charged for electricity consumption and for billing practices.

BC Hydro believes that the BCUC should defer to Measurement Canada's sole jurisdiction over the accuracy of measuring the quantity of electricity. As stated by Measurement Canada on its website: [1]

> **An approved and certified measurement system is integral to accurate and reliable measurement of electricity. The Electricity and Gas Inspection Act (EGIA) and regulations require that we approve and recertify at prescribed intervals measuring devices used to determine a fee for electricity consumption. This helps protect consumers and electric vehicle (EV) charging station operators against loss due to inaccurate measurement and/or unfair practices.**
>
> **….**
>
> **Our mandate is to protect the right of consumers to accurate and reliable measurement when they make a purchase based on measurement. As part of our mandate, we administer the EGIA, which sets out requirements for the performance of measuring devices when charging for the purchase or sale of electricity. It also sets out the requirement for operators to register their measuring devices when selling electricity.**

As BC Hydro explained in section 2.2 of the Application, Measurement Canada is actively seeking input to set performance-based requirements that would allow electric vehicle owners to purchase a charge based on the amount of electricity consumed.

The time-based rates proposed in the Application are currently a valid alternative for charging the customers taking the electric vehicle fast charging service. As explained in section 5 of the Application, BC Hydro has proposed to evaluate technological advancements in metering and billing for fast charging services and the potential need for repricing or redesign of the rates.

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1 https://www.ic.gc.ca/eic/site/mc-mc.nsf/eng/lm04949.html.

5.0 C. RATE DESIGN

Reference: RATE DESIGN
Exhibit B-1, Sections 2.1, 2.2, pp. 10–12, Section 3.3, p. 22, Section 7, p. 40, Section 4.4, Table 4, p. 35; Exhibit E-46, p. 2
Energy-based vs. Time-based Metering

On page 22 of the Application, it states that "BC Hydro has conducted a review of the rates for electric vehicle fast charging service provided by other operators both inside and outside B.C." and that "[a]ll operators charge the service based on time-based units."

1.5.13 Please discuss whether BC Hydro's EV fast charging stations could accommodate electricity-based charging once a Measurement Canada standard is approved without incurring additional capital costs. Why or why not?

RESPONSE:

To implement an electricity-based rate at BC Hydro fast charging stations will require incurring additional capital cost.

The cost estimate for the implementation will be dependent on Measurement Canada adoption of an industry standard for direct current metering. If the embedded metering device in the charging station can be certified by Measurement Canada for metering and billing purposes without a change, then the replacement of the charging equipment may not be required and potentially only software set up cost would be incurred.

If Measurement Canada's standard requires a new or a separate metering device, the charging equipment upgrade or a complete replacement would be required, in addition to potential upgrades required to the billing system.

Estimated cost could be anywhere between a few thousand dollars (no hardware upgrades, with only software set up cost) to up to the cost of a full charging equipment replacement and integration cost.

Time required for the upgrades would vary with the solution and could be from a few hours to a few days per charging station.

5.0 C. RATE DESIGN

Reference: RATE DESIGN
Exhibit B-1, Sections 2.1, 2.2, pp. 10–12, Section 3.3, p. 22, Section 7, p. 40, Section 4.4, Table 4, p. 35; Exhibit E-46, p. 2
Energy-based vs. Time-based Metering

On page 22 of the Application, it states that "BC Hydro has conducted a review of the rates for electric vehicle fast charging service provided by other operators both inside and outside B.C." and that "[a]ll operators charge the service based on time-based units."

1.5.13 Please discuss whether BC Hydro's EV fast charging stations could accommodate electricity-based charging once a Measurement Canada standard is approved without incurring additional capital costs. Why or why not?

1.5.13.1 If not, please identify the changes to the stations that would be required to accommodate electricity-based charging and provide an estimate of the cost and time.

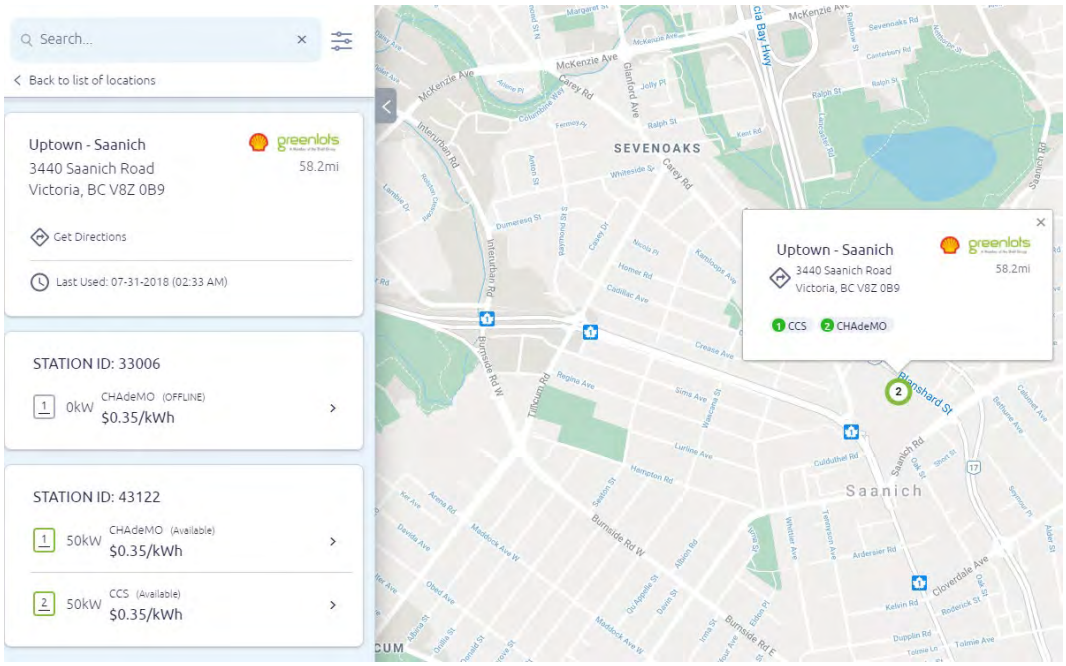
RESPONSE:

Please refer to BC Hydro's response to BCUC IR 1.5.13.

5.0 C. RATE DESIGN

Reference: RATE DESIGN
Exhibit B-1, Sections 2.1, 2.2, pp. 10–12, Section 3.3, p. 22, Section 7, p. 40, Section 4.4, Table 4, p. 35; Exhibit E-46, p. 2
Energy-based vs. Time-based Metering

Shell offers an electricity-based rate at some of its EV fast charging stations, as shown below:[1]



1.5.14 To the best of BC Hydro's knowledge, please explain why other EV fast charging service providers in Canada, such as Shell, can charge an electricity-based rate despite the lack of a Measurement Canada approved standard.

RESPONSE:

BC Hydro is unable to comment on the arrangements of other fast charging service providers.

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1 https://charge.greenlots.com/evowner/portal/locate-charger [retrieved on April 13, 2021]

5.0 C. RATE DESIGN

Reference: RATE DESIGN
Exhibit B-1, Sections 2.1, 2.2, pp. 10–12, Section 3.3, p. 22, Section 7, p. 40, Section 4.4, Table 4, p. 35; Exhibit E-46, p. 2
Energy-based vs. Time-based Metering

On page 12 of the Application, BC Hydro states:

> The American National Standards Institute (**ANSI**) metering working group is currently developing a DC metering standard (ANSI C12.32), which will establish acceptable performance criteria for revenue grade DC kWh energy and kW demand meters. BC Hydro has been monitoring the development of the new DC metering standard. The new standard is currently under review by various North American utilities and equipment manufactures [sic] for formal approval.
>
> In addition to the standards development process, BC Hydro will also participate in the Measurement Canada initiated public consultation process that will start in early 2021. This process is expected to develop performance-based standards that would allow existing and new electric vehicle charging stations that meet established technical standards to charge based on kilowatt-hours (**kWh**) consumed. The expected timeline for this public consultation process is over the next 18 months. [Emphasis retained]

On page 40 of the Application, BC Hydro states:

> The rates will be monitored and a public evaluation filed with the BCUC by March 2024, which will provide an opportunity to update the rates for fast charging service based on developments in the electric vehicle market, customer and stakeholder feedback, as well as any potential metering and billing technology improvements.

1.5.15 Considering customer and stakeholder support for an electricity-based rate, in the event that it is possible to support an electricity-based rate over the next 18 months, please discuss whether BC Hydro would consider switching to an electricity-based rate at that time or wait until it files its public evaluation in March 2024. Why or why not?

RESPONSE

If electricity-based rates for fast charging service become feasible for BC Hydro prior to the planned evaluation in March 2024, BC Hydro will consider advancing an application to the BCUC to implement electricity-based rates, subject to consideration of costs, practicality, as well as customer and stakeholder feedback.

6.0 C. RATE DESIGN

Reference: RATE DESIGN
Exhibit B-1, Section 3.3, Table 2, p. 24
Jurisdiction Review

On page 24, BC Hydro provides the following jurisdiction review:

Table 2 Jurisdiction Review of Rates for Fast Charging Service as of February 2, 2021

Operator	Service	Rate (cents/min) @ Power Level	Number of Sites and Fast Chargers in B.C.
City of North Vancouver	• Single 50 kW charger	20¢ 50 kW	• 1 site • 1 charger
City of Vancouver	• Single or 2x 50 kW chargers	21¢ 50 kW	• 5 sites • 9 chargers
Electrify Canada	• 4x chargers up to 350 kW • Ample lighting, major retail parking lots	27¢ <90kW* 57¢ >90kW* *20% member discount available for $4/month	• 3 sites (additional 5 sites under construction) • 12 chargers
FortisBC	• Single or 2x 50 kW chargers	Current: 30¢ 50 kW Proposed: 27¢ 50 kW 54¢ 100 kW	• 15 sites • 20 chargers
Hydro Quebec Electric Circuit Network	• Basic to high quality stations • Single, 2x, 4x, 6x – 50 kW, and some 100 kW	20.1¢ 50 kW 20.1¢ 100 kW* *interim rate	• ~250 sites in Quebec
Petro-Canada	• 2x chargers up to 350 kW • Ample lighting, on-site amenities/staff	27¢ up to 350 kW	• 12 sites • 23 chargers
Tesla	• Proprietary stations (Tesla only) • Many chargers per site	22¢ <60kW 44¢ >60kW	• 16 sites • 172 chargers

1.6.1 Please confirm, or otherwise explain, that the rates in the above table are exclusive of good and services and provincial sales taxes, and/or any other taxes. If not, please clarify how they can be compared to BC Hydro's proposed rates, which are exclusive of tax.

RESPONSE:

To the best of BC Hydro's knowledge, most of these rates included in Table 2 of the Application do not include sales tax.

BC6.0 C. RATE DESIGN

Reference: RATE DESIGN
Exhibit B-1, Section 3.3, Table 2, p. 24
Jurisdiction Review

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Electrify Canada	• 4x chargers up to 350 kW • Ample lighting, major retail parking lots	27¢ <90kW* 57¢ >90kW* *20% member discount available for $4/month	• 3 sites (additional 5 sites under construction) • 12 chargers
FortisBC	• Single or 2x 50 kW chargers	Current: 30¢ 50 kW Proposed: 27¢ 50 kW 54¢ 100 kW	• 15 sites • 20 chargers
Hydro Quebec Electric Circuit Network	• Basic to high quality stations • Single, 2x, 4x, 6x – 50 kW, and some 100 kW	20.1¢ 50 kW 20.1¢ 100 kW* *interim rate	• ~250 sites in Quebec
Petro-Canada	• 2x chargers up to 350 kW • Ample lighting, on-site amenities/staff	27¢ up to 350 kW	• 12 sites • 23 chargers
Tesla	• Proprietary stations (Tesla only) • Many chargers per site	22¢ <60kW 44¢ >60kW	• 16 sites • 172 chargers

1.6.2 In BC Hydro's view, do rates in the above table reflect, in part, features and attributes of the stations' locations/surroundings, such as proximity to public washrooms, 24/7 hour surveillance, etc.? Please discuss.

RESPONSE:

BC Hydro cannot speculate as to the pricing strategy of station owners, given the potential for varying business objectives of these owners.

BC Hydro can point to research, provided in the Appendix D to the Application (at page 12), that indicates EV drivers prefer stations with reasonable safety and amenities in addition to reliable and available charging infrastructure.

6.0 C. RATE DESIGN

Reference: RATE DESIGN
Exhibit B-1, Section 3.3, Table 2, p. 24
Jurisdiction Review

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Electrify Canada	• 4x chargers up to 350 kW • Ample lighting, major retail parking lots	27¢ <90kW* 57¢ >90kW* *20% member discount available for $4/month	• 3 sites (additional 5 sites under construction) • 12 chargers
FortisBC	• Single or 2x 50 kW chargers	Current: 30¢ 50 kW Proposed: 27¢ 50 kW 54¢ 100 kW	• 15 sites • 20 chargers
Hydro Quebec Electric Circuit Network	• Basic to high quality stations • Single, 2x, 4x, 6x – 50 kW, and some 100 kW	20.1¢ 50 kW 20.1¢ 100 kW* *interim rate	• ~250 sites in Quebec
Petro-Canada	• 2x chargers up to 350 kW • Ample lighting, on-site amenities/staff	27¢ up to 350 kW	• 12 sites • 23 chargers
Tesla	• Proprietary stations (Tesla only) • Many chargers per site	22¢ <60kW 44¢ >60kW	• 16 sites • 172 chargers

1.6.3 Please confirm, or otherwise explain, that the above table does not provide an exhaustive list of fast charging operators in BC.

RESPONSE:

BC Hydro confirms that the above table does not provide an exhaustive list of fast charging operators in B.C. As the market continues to develop additional stations may become available.

6.0 C. RATE DESIGN

Reference: RATE DESIGN
Exhibit B-1, Section 3.3, Table 2, p. 24
Jurisdiction Review

On page 24, BC Hydro provides the following jurisdiction review:

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Electrify Canada	• 4x chargers up to 350 kW • Ample lighting, major retail parking lots	27¢ <90kW* 57¢ >90kW* *20% member discount available for $4/month	• 3 sites (additional 5 sites under construction) • 12 chargers
FortisBC	• Single or 2x 50 kW chargers	Current: 30¢ 50 kW Proposed: 27¢ 50 kW 54¢ 100 kW	• 15 sites • 20 chargers
Hydro Quebec Electric Circuit Network	• Basic to high quality stations • Single, 2x, 4x, 6x – 50 kW, and some 100 kW	20.1¢ 50 kW 20.1¢ 100 kW* *interim rate	• ~250 sites in Quebec
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Tesla	• Proprietary stations (Tesla only) • Many chargers per site	22¢ <60kW 44¢ >60kW	• 16 sites • 172 chargers

1.6.3.1 Please expand Table 2 to include other available networks such as FLO and ChargePoint (with whom BC Hydro has roaming agreements), and Greenlots/Shell.

RESPONSE:

Please see below for other fast charging station operators in B.C. that use Flo and Chargepoint. An additional column "Service Network" has been added to indicate the difference between the owner/operator and the service network.

Station Owner	Service Network	DC Fast Charging Service(s) Offered and Location Types	Rate and Power Level	Number of Sites and Fast Chargers in B.C.
Chilliwack VW	**ChargePoint**	• **1 x 24 kW** • **Dealership**	**Free**	• **1 site / 1 DC charger**
City of New Westminster	**FLO**	• **2 x 50 kW chargers** • **City park**	**26.6¢/min - 50 kW**	• **1 site / 2 DC chargers**
Nanaimo Airport	**ChargePoint**	• **4 x 50 kW chargers between two separate airport lots** • **Airport**	**Free**	• **1 site / 4 DC chargers**
Uptown Mall / Shape Properties	**Greenlots/Shell**	• **Single 50 kW charger** • **Retail underground lot**	**$0.35/kWh - 50kW**	• **1 site / 1 DC charger**

6.0 C. RATE DESIGN

Reference: RATE DESIGN
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FortisBC	• Single or 2x 50 kW chargers	Current: 30¢ 50 kW Proposed: 27¢ 50 kW 54¢ 100 kW	• 15 sites • 20 chargers
Hydro Quebec Electric Circuit Network	• Basic to high quality stations • Single, 2x, 4x, 6x – 50 kW, and some 100 kW	20.1¢ 50 kW 20.1¢ 100 kW* *interim rate	• ~250 sites in Quebec
Petro-Canada	• 2x chargers up to 350 kW • Ample lighting, on-site amenities/staff	27¢ up to 350 kW	• 12 sites • 23 chargers
Tesla	• Proprietary stations (Tesla only) • Many chargers per site	22¢ <60kW 44¢ >60kW	• 16 sites • 172 chargers

1.6.4 Please indicate whether BC Hydro has put any weight to Hydro-Quebec's fast charging service rate in establishing its proposed rates. If so, please explain why, given that Hydro-Quebec power is generally cheaper than BC Hydro's power and the service is not competing with BC Hydro's.

RESPONSE:

BC Hydro considered Hydro-Quebec's fast charging service rate, but it was not major factor in establishing our Proposed Rates. BC Hydro notes that Hydro Quebec has a different economic, policy and regulatory framework than BC Hydro.

6.0 C. RATE DESIGN

Reference: RATE DESIGN
Exhibit B-1, Section 3.3, Table 2, p. 24
Jurisdiction Review

On page 24, BC Hydro provides the following jurisdiction review:

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FortisBC	• Single or 2x 50 kW chargers	Current: 30¢ 50 kW Proposed: 27¢ 50 kW 54¢ 100 kW	• 15 sites • 20 chargers
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Tesla	• Proprietary stations (Tesla only) • Many chargers per site	22¢ <60kW 44¢ >60kW	• 16 sites • 172 chargers

1.6.5 Please indicate whether BC Hydro has put any weight to FortisBC Inc. fast charging service rate in establishing its proposed rates. If so, please explain why, given that FortisBC's power is generally more expensive than BC Hydro's power and the service is not competing with BC Hydro's in the same service areas.

RESPONSE:

BC Hydro considered the FortisBC rate but it was not a major factor in our Proposed Rates. BC Hydro notes that there are differences in the two utilities operating environment and costs.

7.0 C. RATE DESIGN

Reference: RATE DESIGN
Exhibit B-1, Section 4.1, p. 25, Section 4.2, pp. 28–30
Proposed Rates Calculations

On page 25 of the Application, BC Hydro states:

> The proposed RS 1360, which is applicable to public fast charging service at 25 kW stations, is considered a Small General Service (SGS) rate and is proposed at 12 cents per minute; RS 1560, which is applicable to public fast charging service at 50 kW stations, is considered a Medium General Service rate (MGS) and is proposed at 21 cents per minute, and RS 1561, which is applicable to public fast charging service at 100 kW stations, is also considered an MGS rate and proposed at 27 cents per minute. The Proposed Rates are applicable in all of BC Hydro's integrated area or Rate Zone I.

On pages 28 to 30 of the Application, BC Hydro provides the following equations:

Equation 1: Rate to recover electricity costs =

{(Peak Demand x Demand Charge) / Average Number of Charging Session per Station per month + (Average Electricity Consumption per Charging Session x Energy Charge)} / Average Charging Session Length

Equation 2: Rate to recover station maintenance costs =

{(Annual Maintenance Costs) /12 months} / Average Number of Charging Session per Station per month / Average Charging Session Length

Equation 3: Rate to recover station capital costs =

{(Annualized Capital Costs) /12 months} / Average Number of Charging Session per Station per month / Average Charging Session Length

1.7.1 Please explain how BC Hydro arrived at the levels of the Proposed Rates. If a decision-making framework was used, please provide it. For instance, with no usage data on the 100 kW station, please explain how BC Hydro determined that $0.27/min or $0.06 additional than the 50 kW power level is just, fair, and reasonable.

RESPONSE:

When designing the Proposed Rates, BC Hydro considered the feedback from customers and stakeholders; maintaining a level playing field with other fast charging station operators in BC Hydro's service territory; and balancing the near-time objective of supporting station utilization, thereby minimizing cost impact on all ratepayers, with longer-term objective of full cost recovery from fast charging service Customers as discussed in section 4.1 of the Application.

To encourage station utilization while maintaining a level playing field with other fast charging station operators in BC Hydro's service territory, the Proposed Rates considered the prices of other operators, the range of prices that research indicates customers are willing to pay, while to collect sufficient revenue to recover at least the cost of electricity based on BC Hydro's General Service Rate Schedules.

In the instance, such as 100 kW stations, where there is lack of or no usage data available, 50 kW data was used as proxy. A key difference to be noted between the 50 kW and 100 kW station rate design, as described in section 4.2 of the Application, is that the station utilization needed for electricity cost recovery is higher for the 100 kW station than it is for the 50 kW station because the Peak Demand is higher. BC Hydro expects that utilization will be higher at the 100 kW stations because they are expected to be used primarily at locations near primary travel corridors or where higher demand for charging has been demonstrated.

As described in section 5 of the Application, BC Hydro proposes to monitor several aspects of the fast charging service, including station utilization (at different power levels), revenue collected under the applicable Rate Schedules, costs incurred, and customer feedback, and provide an evaluation report to the BCUC by March 31, 2024.

7.0 C. RATE DESIGN

Reference: RATE DESIGN
Exhibit B-1, Section 4.1, p. 25, Section 4.2, pp. 28–30
Proposed Rates Calculations

On page 25 of the Application, BC Hydro states:

> The proposed RS 1360, which is applicable to public fast charging service at 25 kW stations, is considered a Small General Service (SGS) rate and is proposed at 12 cents per minute; RS 1560, which is applicable to public fast charging service at 50 kW stations, is considered a Medium General Service rate (MGS) and is proposed at 21 cents per minute, and RS 1561, which is applicable to public fast charging service at 100 kW stations, is also considered an MGS rate and proposed at 27 cents per minute. The Proposed Rates are applicable in all of BC Hydro's integrated area or Rate Zone I.

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{(Peak Demand x Demand Charge) / Average Number of Charging Session per Station per month + (Average Electricity Consumption per Charging Session x Energy Charge)} / Average Charging Session Length

Equation 2: Rate to recover station maintenance costs =

{(Annual Maintenance Costs) /12 months} / Average Number of Charging Session per Station per month / Average Charging Session Length

Equation 3: Rate to recover station capital costs =

{(Annualized Capital Costs) /12 months} / Average Number of Charging Session per Station per month / Average Charging Session Length

1.7.2 Please provide the supporting calculations, in fully functional spreadsheet format if available, for BC Hydro to arrive at the Proposed Rates for the three respective rate schedules (RS).

RESPONSE:

When preparing this response, BC Hydro notes an error on page 32 of the Application. This page should have indicated that the utilization of 100 kW stations is 5.5 per cent. This is corrected in Errata No. 1 to the Application. This error does not change the rate calculation or the Proposed Rates.

Please refer to the Excel file, provided as Attachment 1, which calculates the Proposed Rates for the three respective rate schedules (RS).

The spreadsheet shows the calculation for the Proposed Rate of 21 cents per minute for 50 kW stations at assumed utilization rate of 3.7 per cent and which recovers the electricity supply cost. It includes the other utilization scenarios in Table 3 of the Application.

It also provides the calculation for the Proposed Rate of 27 cents per minute for 100 kW stations at an assumed utilization rate of 5.5 per cent and which recovers the electricity supply cost. It includes the other utilization scenarios.

For 25 kW service (RS 1360), the Proposed Rate of 12 cents per minute will recover all of electricity supply costs and some charging station capital and maintenance costs as discussed on page 32 of the Application.

Unlike RS 1560 and RS 1561 which are based on Medium General Service (MGS), RS 1360 is based on Small General Service (SGS) and SGS does not have a demand charge. As shown in the spreadsheet, the fast charging rate to recover the electricity cost based on the SGS rate is only 6 cents per minute irrespective of utilization rate level. However, because the SGS rate does not have a demand charge, in practice 6 cents per minute may under recovery of demand related costs. BC Hydro has therefore set the rate at 12 cents per minute, about 60 per cent of Proposed Rate for 50 kW, that ensure recovery some demand related costs as well as possibly also charging station capital and maintenance costs.

BC Hydro
Power smart

REFER TO LIVE SPREADSHEET MODEL

Provided in electronic format only

(Accessible by opening the Attachments Tab in Adobe)

7.0 C. RATE DESIGN

Reference: RATE DESIGN
Exhibit B-1, Section 4.1, p. 25, Section 4.2, pp. 28–30
Proposed Rates Calculations

On page 25 of the Application, BC Hydro states:

> The proposed RS 1360, which is applicable to public fast charging service at 25 kW stations, is considered a Small General Service (SGS) rate and is proposed at 12 cents per minute; RS 1560, which is applicable to public fast charging service at 50 kW stations, is considered a Medium General Service rate (MGS) and is proposed at 21 cents per minute, and RS 1561, which is applicable to public fast charging service at 100 kW stations, is also considered an MGS rate and proposed at 27 cents per minute. The Proposed Rates are applicable in all of BC Hydro's integrated area or Rate Zone I.

On pages 28 to 30 of the Application, BC Hydro provides the following equations:

Equation 1: Rate to recover electricity costs =

{(Peak Demand x Demand Charge) / Average Number of Charging Session per Station per month + (Average Electricity Consumption per Charging Session x Energy Charge)} / Average Charging Session Length

Equation 2: Rate to recover station maintenance costs =

{(Annual Maintenance Costs) /12 months} / Average Number of Charging Session per Station per month / Average Charging Session Length

Equation 3: Rate to recover station capital costs =

{(Annualized Capital Costs) /12 months} / Average Number of Charging Session per Station per month / Average Charging Session Length

1.7.2.1 Please clarify whether BC Hydro has considered other revenues that could be generated from providing public EV charging service, such as carbon credits, that would offset costs of providing the service.

RESPONSE:

BC Hydro has considered credit revenues from the sale of credits it receives as a result of electricity sold through its fleet of EV fast charging stations under the Renewable & Low Carbon Fuel Requirements Regulation.

The value of any credits depends on the ongoing demand for, and supply of, credits. Future revenues are uncertain as supply and demand may fluctuate year-to-year, and there may be changes in the low carbon fuels program. Because of these uncertainties, BC Hydro has not included any related revenues in the rate analyses presented in the Application.

7.0 C. RATE DESIGN

Reference: RATE DESIGN
Exhibit B-1, Section 4.1, p. 25, Section 4.2, pp. 28–30
Proposed Rates Calculations

On page 25 of the Application, BC Hydro states:

> The proposed RS 1360, which is applicable to public fast charging service at 25 kW stations, is considered a Small General Service (SGS) rate and is proposed at 12 cents per minute; RS 1560, which is applicable to public fast charging service at 50 kW stations, is considered a Medium General Service rate (MGS) and is proposed at 21 cents per minute, and RS 1561, which is applicable to public fast charging service at 100 kW stations, is also considered an MGS rate and proposed at 27 cents per minute. The Proposed Rates are applicable in all of BC Hydro's integrated area or Rate Zone I.

On pages 28 to 30 of the Application, BC Hydro provides the following equations:

Equation 1: Rate to recover electricity costs =

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Equation 2: Rate to recover station maintenance costs =

{(Annual Maintenance Costs) /12 months} / Average Number of Charging Session per Station per month / Average Charging Session Length

Equation 3: Rate to recover station capital costs =

{(Annualized Capital Costs) /12 months} / Average Number of Charging Session per Station per month / Average Charging Session Length

1.7.3 Given the nature of the EV market, please clarify whether BC Hydro has considered levelized rates. If available, please provide BC Hydro's public EV fast charging rates based on a levelized approach and include a brief description of the assumptions used.

RESPONSE:

BC Hydro did not consider levelized rates.

7.0 C. RATE DESIGN

Reference: RATE DESIGN
Exhibit B-1, Section 4.1, p. 25, Section 4.2, pp. 28–30
Proposed Rates Calculations

On page 25 of the Application, BC Hydro states:

> The proposed RS 1360, which is applicable to public fast charging service at 25 kW stations, is considered a Small General Service (SGS) rate and is proposed at 12 cents per minute; RS 1560, which is applicable to public fast charging service at 50 kW stations, is considered a Medium General Service rate (MGS) and is proposed at 21 cents per minute, and RS 1561, which is applicable to public fast charging service at 100 kW stations, is also considered an MGS rate and proposed at 27 cents per minute. The Proposed Rates are applicable in all of BC Hydro's integrated area or Rate Zone I.

On pages 28 to 30 of the Application, BC Hydro provides the following equations:

Equation 1: Rate to recover electricity costs =

{(Peak Demand x Demand Charge) / Average Number of Charging Session per Station per month + (Average Electricity Consumption per Charging Session x Energy Charge)} / Average Charging Session Length

Equation 2: Rate to recover station maintenance costs =

{(Annual Maintenance Costs) /12 months} / Average Number of Charging Session per Station per month / Average Charging Session Length

Equation 3: Rate to recover station capital costs =

{(Annualized Capital Costs) /12 months} / Average Number of Charging Session per Station per month / Average Charging Session Length

1.7.3.1 Please compare the pros and cons of using levelized rates versus BC Hydro's Proposed Rates.

RESPONSE:

A levelized approach allows for a more stable and predictable rate during the period that the levelized rates are applicable (for example, expected lifetime of the station).

However, as further discussed in BC Hydro's response to BCUC IR 1.15.4, levelized rates require a forecast of revenue and utilization over a number of years. BC Hydro does not currently have sufficient information to develop a reliable long term forecast of utilization and revenue and therefore is not considering levelized rate as a practical option at this time.

In addition, BC Hydro's proposed approach has the benefit of providing flexibility to revisit pricing in 2024 including the assessment to potential technological advancements in metering and billing for fast charging services.

As described in section 5 of the Application, BC Hydro proposes to monitor several aspects of the fast charging service, including station utilization (at different power levels), revenue collected under the applicable Rate Schedules, costs incurred, and customer feedback, and provide to the BCUC by March 31, 2024 an evaluation report and recommendations for fast charging service rates going forward.

7.0 C. RATE DESIGN

Reference: RATE DESIGN
Exhibit B-1, Section 4.1, p. 25, Section 4.2, pp. 28–30
Proposed Rates Calculations

On page 25 of the Application, BC Hydro states:

> The proposed RS 1360, which is applicable to public fast charging service at 25 kW stations, is considered a Small General Service (SGS) rate and is proposed at 12 cents per minute; RS 1560, which is applicable to public fast charging service at 50 kW stations, is considered a Medium General Service rate (MGS) and is proposed at 21 cents per minute, and RS 1561, which is applicable to public fast charging service at 100 kW stations, is also considered an MGS rate and proposed at 27 cents per minute. The Proposed Rates are applicable in all of BC Hydro's integrated area or Rate Zone I.

On pages 28 to 30 of the Application, BC Hydro provides the following equations:

Equation 1: Rate to recover electricity costs =

{(Peak Demand x Demand Charge) / Average Number of Charging Session per Station per month + (Average Electricity Consumption per Charging Session x Energy Charge)} / Average Charging Session Length

Equation 2: Rate to recover station maintenance costs =

{(Annual Maintenance Costs) /12 months} / Average Number of Charging Session per Station per month / Average Charging Session Length

Equation 3: Rate to recover station capital costs =

{(Annualized Capital Costs) /12 months} / Average Number of Charging Session per Station per month / Average Charging Session Length

1.7.4 Please discuss BC Hydro's plans to install DCFC charging stations in its non-integrated areas within the next 3 to 5 years.

RESPONSE:

BC Hydro plans to deploy charging stations in some NIA communities in the next three to five years. An important factor that will inform BC Hydro's deployment plans for NIA communities is whether the community is diesel powered or is powered by a renewable energy resource. BC Hydro will work with each NIA community to determine if a fast charger is appropriate for the community.

7.0 C. RATE DESIGN

Reference: RATE DESIGN
Exhibit B-1, Section 4.1, p. 25, Section 4.2, pp. 28–30
Proposed Rates Calculations

On page 30, BC Hydro states:

> Maintenance costs are those costs associated with metering, repair and other station maintenance work and are approximately $8,000 per year per station. Not included are labour costs associated with electric vehicle infrastructure which are approximately $800,000 per year.

1.7.5 Please explain why BC Hydro has not included the labour costs of $800,000/year associated with EV infrastructure in its calculation of the full cost of service.

RESPONSE:

The Application only included costs that could be solely attributed to station metering, repair and maintenance costs and did not include any labour costs that were not solely attributable to electric vehicle fast charging stations.

The labour costs referred to on page 30 of the Application represent a team of staff in the Customer Service Key Business Unit who lead the development of transportation electrification strategies within BC Hydro, including electric vehicles adoption and promotion. Supporting electric vehicle fast charging infrastructure implementation is only a portion of their responsibilities. Consistent with Directive 28 of BCUC Order G-246-20 for BC Hydro's Fiscal 2020 and Fiscal 2021 Revenue Requirements Application, these labour costs were deferred to the Electric Vehicle Costs Regulatory Account; however, as these costs were not solely attributable to electric vehicle fast charging stations, they were not included in the full cost of service calculation.

7.0 C. RATE DESIGN

Reference: RATE DESIGN
Exhibit B-1, Section 4.1, p. 25, Section 4.2, pp. 28–30
Proposed Rates Calculations

On page 30, BC Hydro states:

> Maintenance costs are those costs associated with metering, repair and other station maintenance work and are approximately $8,000 per year per station. Not included are labour costs associated with electric vehicle infrastructure which are approximately $800,000 per year.

1.7.5 Please explain why BC Hydro has not included the labour costs of $800,000/year associated with EV infrastructure in its calculation of the full cost of service.

1.7.5.1 Please clarify in which account BC Hydro includes these labour costs.

RESPONSE:

In the Fiscal 2022 Revenue Requirements Application, the labour costs of $800,000 are included in Appendix A, Schedule 5.6, line 2 (by KBU) and line 15 (by resource).

7.0 C. RATE DESIGN

Reference: RATE DESIGN
Exhibit B-1, Section 4.1, p. 25, Section 4.2, pp. 28–30
Proposed Rates Calculations

On page 30, BC Hydro states:

> Maintenance costs are those costs associated with metering, repair and other station maintenance work and are approximately $8,000 per year per station. Not included are labour costs associated with electric vehicle infrastructure which are approximately $800,000 per year.

1.7.5 Please explain why BC Hydro has not included the labour costs of $800,000/year associated with EV infrastructure in its calculation of the full cost of service.

1.7.5.2 Has BC Hydro included any overhead costs in its calculation of the full cost of service? If not, please explain why not.

RESPONSE:

BC Hydro did not include any overhead costs in its calculation of the full cost of service. The net capital cost per dual station site of $85,000, noted on page 30 of the Application, did not include any capital overhead. BC Hydro did not include any other overhead in the cost of service calculation.

BC Hydro notes that effective October 2020, we have commenced charging capital overhead to EV infrastructure implementation projects after reviewing its applicability to EV charging stations.

7.0 C. RATE DESIGN

Reference: RATE DESIGN
Exhibit B-1, Section 4.1, p. 25, Section 4.2, pp. 28–30
Proposed Rates Calculations

On page 30, BC Hydro states:

> Maintenance costs are those costs associated with metering, repair and other station maintenance work and are approximately $8,000 per year per station. Not included are labour costs associated with electric vehicle infrastructure which are approximately $800,000 per year.

1.7.6 Please clarify if costs related to development and maintenance of the EV App are included in the maintenance cost category. If not, please state where they are captured.

RESPONSE:

Confirmed. The EV App is provided by a third-party and the licensing costs associated with the App are included in the maintenance cost category.

7.0 C. RATE DESIGN

Reference: RATE DESIGN
Exhibit B-1, Section 4.1, p. 25, Section 4.2, pp. 28–30
Proposed Rates Calculations

On page 30, BC Hydro states:

> Capital costs are approximately $85,000 per dual station site, amortized over ten years net of contributions by third parties such as NRCan are included. This figure includes costs such as site selection, properties, legal, design, engineering, lighting, signage, line construction, civil construction and capital cost investments by BC Hydro. Gross capital costs are approximately $235,000 per dual station site when contributions, which are not guaranteed, by third parties such as NRCan are not included.

1.7.7 Please clarify whether BC Hydro used the capital costs net of contributions or the gross capital costs for purposes of cost recovery calculations.

RESPONSE:

This response also addresses BCUC IR 1.7.7.1.

BC Hydro used capital costs net of contributions for the purposes of the cost recovery calculations.

While future third-party contributions are not guaranteed, they were included in the capital cost recovery calculation as BC Hydro expects to continue partnering with NRCan for funding of electric vehicle fast charging stations and excluding them would result in rates that would over-recover the costs of installed stations that have received or are on track to receive contributions.

Below is a revised Table 3 which uses gross capital costs of $235,000 per station and with an added row for a 7.5 per cent utilization rate:

Utilization Rate		Scenario 1	Scenario 2	Scenario 3
(%)	Average Number of Charging Sessions per Station per Month	Electricity Costs (RS 1500 Equivalent)	Electricity + Station Maintenance Costs	Full Cost of Service: Electricity + Maintenance + Capital Costs
		($/min)	($/min)	($/min)
3.0	46	0.25	0.76	2.25
3.7	57	0.21	0.62	1.83
5.0	77	0.17	0.47	1.36
7.5	115	0.13	0.33	0.92
10.0	153	0.11	0.26	0.70
15.0	230	0.09	0.19	0.48
20.0	307	0.07	0.15	0.37

7.0 C. RATE DESIGN

Reference: RATE DESIGN
Exhibit B-1, Section 4.1, p. 25, Section 4.2, pp. 28–30
Proposed Rates Calculations

On page 30, BC Hydro states:

> Capital costs are approximately $85,000 per dual station site, amortized over ten years net of contributions by third parties such as NRCan are included. This figure includes costs such as site selection, properties, legal, design, engineering, lighting, signage, line construction, civil construction and capital cost investments by BC Hydro. Gross capital costs are approximately $235,000 per dual station site when contributions, which are not guaranteed, by third parties such as NRCan are not included.

1.7.7 Please clarify whether BC Hydro used the capital costs net of contributions or the gross capital costs for purposes of cost recovery calculations.

1.7.7.1 If BC Hydro included the net capital costs in the full cost of service calculations, please explain why, considering that third-party contributions are not guaranteed, and provide a revised Table 3 using gross capital costs (and including a 7.5% utilization rate).

RESPONSE:

Please refer to BC Hydro's response to BCUC IR 1.7.7.

7.0 C. RATE DESIGN
Reference: RATE DESIGN
Exhibit B-1, Section 4.1, p. 25, Section 4.2, pp. 28–30
Proposed Rates Calculations

On page 30, BC Hydro states:

> Capital costs are approximately $85,000 per dual station site, amortized over ten years net of contributions by third parties such as NRCan are included. This figure includes costs such as site selection, properties, legal, design, engineering, lighting, signage, line construction, civil construction and capital cost investments by BC Hydro. Gross capital costs are approximately $235,000 per dual station site when contributions, which are not guaranteed, by third parties such as NRCan are not included.

1.7.8 Please clarify if there are instances where BC Hydro is required to repay the third-party contribution.

RESPONSE:

This response is being filed in confidence with the BCUC only as the terms in the contribution agreement are confidential.

7.0 C. RATE DESIGN

Reference: RATE DESIGN
Exhibit B-1, Section 4.1, p. 25, Section 4.2, pp. 28–30
Proposed Rates Calculations

On page 30, BC Hydro states:

> Capital costs are approximately $85,000 per dual station site, amortized over ten years net of contributions by third parties such as NRCan are included. This figure includes costs such as site selection, properties, legal, design, engineering, lighting, signage, line construction, civil construction and capital cost investments by BC Hydro. Gross capital costs are approximately $235,000 per dual station site when contributions, which are not guaranteed, by third parties such as NRCan are not included.

1.7.8 Please clarify if there are instances where BC Hydro is required to repay the third-party contribution.

1.7.8.1 If so, has BC Hydro factored into its full cost of service calculation the need to repay such contributions? If not, please explain why not.

RESPONSE:

Please refer to BC Hydro's response to BCUC IR 1.7.8.

7.0 C. RATE DESIGN

Reference: RATE DESIGN
Exhibit B-1, Section 4.1, p. 25, Section 4.2, pp. 28–30
Proposed Rates Calculations

On page 30, BC Hydro states:

> Capital costs are approximately $85,000 per dual station site, amortized over ten years net of contributions by third parties such as NRCan are included. This figure includes costs such as site selection, properties, legal, design, engineering, lighting, signage, line construction, civil construction and capital cost investments by BC Hydro. Gross capital costs are approximately $235,000 per dual station site when contributions, which are not guaranteed, by third parties such as NRCan are not included.

1.7.9 Do the capital costs include the costs to make the stations wheelchair accessible? Are all current and future stations wheelchair accessible?

RESPONSE:

The quoted capital cost of $235,000 per dual station site does not include the cost to make a station wheelchair accessible. BC Hydro estimates about 30 per cent capital cost increase to make a dual station site wheelchair accessible due to required design changes and overall site layout.

At present, only a few stations are wheelchair accessible.

BC Hydro is making efforts to make future station sites wheelchair accessible, but it may not be possible to achieve at each site.

7.0 C. RATE DESIGN

Reference: RATE DESIGN
Exhibit B-1, Section 4.1, p. 25, Section 4.2, pp. 28–30
Proposed Rates Calculations

On page 30, BC Hydro states:

> Capital costs are approximately $85,000 per dual station site, amortized over ten years net of contributions by third parties such as NRCan are included. This figure includes costs such as site selection, properties, legal, design, engineering, lighting, signage, line construction, civil construction and capital cost investments by BC Hydro. Gross capital costs are approximately $235,000 per dual station site when contributions, which are not guaranteed, by third parties such as NRCan are not included.

1.7.10 Do the capital costs include the costs of building any other structures around or above the stations? Please discuss.

RESPONSE:

The capital cost only includes necessary infrastructure for a fully functioning station site, such as civil and electrical infrastructure to connect a charging station to BC Hydro system (e.g., service connection, underground or overhead infrastructure, transformer, and Measurement Canada certified AC meter), charger connection (e.g., a charger, a kiosk, and concrete pad), mechanical charger protection (i.e., bollards), signage and lighting.

8.0 C. RATE DESIGN

Reference: RATE DESIGN
Exhibit B-1, Section 2.1, p. 10 and Section 4.1, p. 25;
Petro-Canada website, Electric Highway section
Single rate versus differentiated rates

On page 25, BC Hydro states that it "considered proposing a single rate for all station power levels, based on the feedback shown in section 3.2, we decided to propose a different rate for each of the three station power levels".

1.8.1 Please discuss the pros and cons of having a single rate for all power levels versus differentiated rates by power level.

RESPONSE:

Given that the majority of BC Hydro's Fast Charging Service is at the 50 kW power level, having a single rate for all power levels would simplify implementation and administration.

However, as noted in the preamble to this question, this concept does not have strong support from customers and stakeholders.

8.0 C. RATE DESIGN

Reference: RATE DESIGN
Exhibit B-1, Section 2.1, p. 10 and Section 4.1, p. 25;
Petro-Canada website, Electric Highway section
Single rate versus differentiated rates

On page 25, BC Hydro states that it "considered proposing a single rate for all station power levels, based on the feedback shown in section 3.2, we decided to propose a different rate for each of the three station power levels".

1.8.1.1 Would a single rate for all power levels improve or worsen the rate design performance based on the Bonbright principles? Please explain.

RESPONSE:

BC Hydro expects that a single rate for all power levels would improve performance on factors related to the practicality and cost effectiveness of implementation. This is because implementing one rate schedule is simpler and requires lower cost then implementing three rate schedules.

BC Hydro expects that a single rate for all power levels would worsen performance on factors related to the fair apportionment of costs among customers. BC Hydro's cost of service does vary by power level and is higher for a 100 kW station than it is for 25 kW stations because BC Hydro's costs are influenced by the amount of electricity capacity made available for a given service. BC Hydro makes more electrical capacity available at a 100 kW station than it does at a 25 kW station.

8.0 C. RATE DESIGN

Reference: RATE DESIGN
Exhibit B-1, Section 2.1, p. 10 and Section 4.1, p. 25;
Petro-Canada website, Electric Highway section
Single rate versus differentiated rates

On page 25, BC Hydro states that it "considered proposing a single rate for all station power levels, based on the feedback shown in section 3.2, we decided to propose a different rate for each of the three station power levels".

1.8.2 How much weight did BC Hydro place on customer feedback relative to other variables when selecting this rate design?

RESPONSE:

BC Hydro considers customer feedback as being very important in any of our rate designs.

As noted on page 25 of the Application, BC Hydro's longer-term rate design objective is for the fast charging service rates to collect sufficient revenues from the customers of the service to recover its full costs of service. BC Hydro considered customer feedback within the context of this objective.

We considered and adopted customer feedback when it was practical to do so, subject to, for example, metering limitations, and when it could be done in a manner consistent with our objective as stated above.

8.0 C. RATE DESIGN

Reference: RATE DESIGN
Exhibit B-1, Section 2.1, p. 10 and Section 4.1, p. 25;
Petro-Canada website, Electric Highway section
Single rate versus differentiated rates

On page 25, BC Hydro states that it "considered proposing a single rate for all station power levels, based on the feedback shown in section 3.2, we decided to propose a different rate for each of the three station power levels".

1.8.3 If BC Hydro had proposed a single rate for all power levels, what rate would it have been? Please discuss what variables would have factored into the selection of the rate level.

RESPONSE:

BC Hydro did not develop pricing for a single rate for all power levels. If we had done so, we expect that we would have used the same approach and input variables that are itemized as described in section 4.2 of the Application, such as costs of service and station utilization, and would also consider the results of the jurisdiction review (where appropriate), such as the charging price of other operators in BC Hydro's service territory.

8.0 C. RATE DESIGN

Reference: RATE DESIGN
Exhibit B-1, Section 2.1, p. 10 and Section 4.1, p. 25;
Petro-Canada website, Electric Highway section
Single rate versus differentiated rates

On page 25, BC Hydro states that it "considered proposing a single rate for all station power levels, based on the feedback shown in section 3.2, we decided to propose a different rate for each of the three station power levels".

1.8.4 Please indicate whether BC Hydro designed its fast charging infrastructure to allow power sharing between stations on a single site. (For example, Tesla's V2 Superchargers (150 kW) split their power between two chargers, so if there is only one charger used, the peak rate is 150 kW but if the two chargers are used simultaneously the power is shared, affecting the users' charging speed. V3 Superchargers get 250 kW each, all the time, so how busy a Supercharger station is will have no effect on a user's charging speed.)

RESPONSE:

Power sharing as described in the question does not exist on the current charging station models installed at BC Hydro sites. At BC Hydro charging sites, a charging station can only charge one vehicle at a time. Thus, the impact of multi-vehicle charging is not taken into account when designing the Proposed Rates.

Power sharing for multi-vehicle charging can be achieved with a power management software that dynamically manages power supply across multiple charging sessions dispensed from the same charging station. This may cause slower charging speed when multiple vehicles are charging at the same time.

An electric vehicle energy management system to control electric vehicle supply equipment loads would also need to be implemented as a means to limit the demand on the distribution equipment, such as feeder conductors, are not deployed on BC Hydro charging sites.

For clarity, at sites with dual charging stations, each station can be utilized to its full capacity concurrently.

8.0 C. RATE DESIGN

Reference: RATE DESIGN
Exhibit B-1, Section 2.1, p. 10 and Section 4.1, p. 25;
Petro-Canada website, Electric Highway section
Single rate versus differentiated rates

On page 25, BC Hydro states that it "considered proposing a single rate for all station power levels, based on the feedback shown in section 3.2, we decided to propose a different rate for each of the three station power levels".

1.8.4 Please indicate whether BC Hydro designed its fast charging infrastructure to allow power sharing between stations on a single site. (For example, Tesla's V2 Superchargers (150 kW) split their power between two chargers, so if there is only one charger used, the peak rate is 150 kW but if the two chargers are used simultaneously the power is shared, affecting the users' charging speed. V3 Superchargers get 250 kW each, all the time, so how busy a Supercharger station is will have no effect on a user's charging speed.)

1.8.4.1 If so, please discuss how power sharing could affect charging times and how BC Hydro has taken this into account when designing the Proposed Rates in this Application.

RESPONSE:

Please refer to BC Hydro's response to BCUC IR 1.8.4.

8.0 C. RATE DESIGN

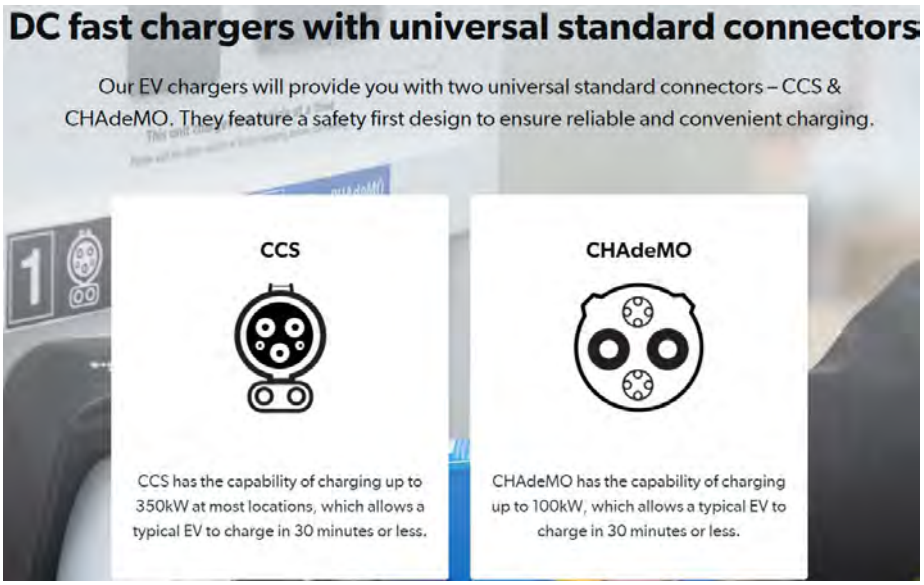
Reference: RATE DESIGN
Exhibit B-1, Section 2.1, p. 10 and Section 4.1, p. 25;
Petro-Canada website, Electric Highway section
Single rate versus differentiated rates

On its website, Petro-Canada states[1]:

Pay only for the time you charge.

We've now implemented time-based, competitive pricing at our charging stations. Pay only **$0.27 per minute** in British Columbia when you visit us on Canada's Electric Highway™, with no connection or idling fees.*

Charging speeds reach between 4 km and 30 km of range per minute of charging. Each of our EV charging stations offer up to a maximum of 200kW or 350kW of power output, depending on the station.



1.8.5 Can the Petro-Canada EV fast charging rate be considered a single rate for various power levels (up to 350 kW with the Combined Charging System (CCS) connector and up to 100 kW with the CHAdeMO)?

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1 https://www.petro-canada.ca/en/personal/fuel/canadas-electric-highway [retrieved on April 16, 2021]

RESPONSE:

Based on the information provided in the preamble, BC Hydro would consider the Petro-Canada EV fast charging rate to be a single per-minute rate, for varying power levels up to the maximum capability of the charging equipment (up to 100 kW for CHAdeMO or up to 350 kW for CCS).

8.0 C. RATE DESIGN

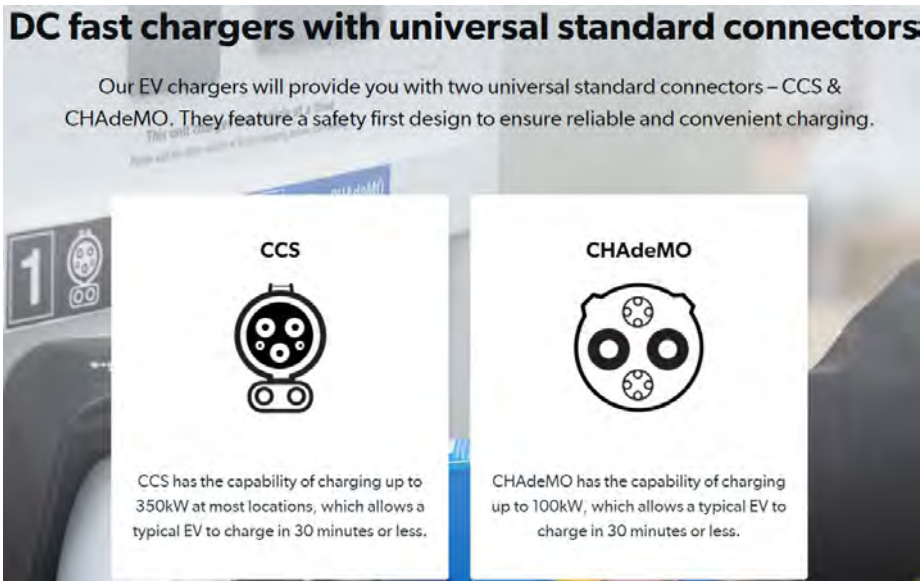
Reference: RATE DESIGN
Exhibit B-1, Section 2.1, p. 10 and Section 4.1, p. 25;
Petro-Canada website, Electric Highway section
Single rate versus differentiated rates

On its website, Petro-Canada states[1]:

Pay only for the time you charge.

We've now implemented time-based, competitive pricing at our charging stations. Pay only **$0.27 per minute** in British Columbia when you visit us on Canada's Electric Highway™, with no connection or idling fees.*

Charging speeds reach between 4 km and 30 km of range per minute of charging. Each of our EV charging stations offer up to a maximum of 200kW or 350kW of power output, depending on the station.



1.8.5.1 Please revise the Petro-Canada entry in Table 2 of the Application to reflect that the CCS connection has the capability of charging up to a maximum of 200 kW or 350 kW depending on the station and CHAdeMO has the capability of charging up to a maximum of 100 kW.

[1] https://www.petro-canada.ca/en/personal/fuel/canadas-electric-highway [retrieved on April 16, 2021]

RESPONSE:

Please see below for a reproduction of Table 2 of the Application with the requested information added.

Operator	Service	Rate (cents/min) @ Power Level	Number of Sites and Fast Chargers in B.C.
City of North Vancouver	Single 50 kW charger	20¢ 50 kW	1 site 1 charger
City of Vancouver	Single or 2x 50 kW chargers	21¢ 50 kW	5 sites 9 chargers
Electrify Canada	4x chargers up to 350 kW Ample lighting, major retail parking lots	27¢ <90kW* 57¢ >90kW* *20% member discount available for $4/month	3 sites (additional 5 sites under construction) 12 chargers
FortisBC	Single or 2x 50 kW chargers	Current: 30¢ 50 kW Proposed: 27¢ 50 kW 54¢ 100 kW	15 sites 20 chargers
Hydro Quebec Electric Circuit Network	Basic to high quality stations Single, 2x, 4x, 6x – 50 kW, and some 100 kW	20.1¢ 50 kW 20.1¢ 100 kW* *interim rate	~250 sites in Quebec
Petro-Canada	2x chargers up to 350 kW Up to a maximum of 200 kW or 350 kW depending on the station for CCS connection Up to a maximum of 100 kW for CHADdeMO connection Ample lighting, on-site amenities/staff	27¢ up to 350 kW	12 sites 23 chargers
Tesla	Proprietary stations (Tesla only) Many chargers per site	22¢ <60kW 44¢ >60kW	16 sites 172 chargers

8.0 C. RATE DESIGN

Reference: RATE DESIGN
Exhibit B-1, Section 2.1, p. 10 and Section 4.1, p. 25;
Petro-Canada website, Electric Highway section
Single rate versus differentiated rates

On page 10 of the Application, BC Hydro notes that "the time required to charge an EV will also be dependent on what the vehicle can accept and, in many cases, a similar amount of electricity is dispensed from a 25 kW, 50 kW or 100 kW stations once the battery exceeds 90 per cent capacity".

1.8.6 Please discuss the fairness of charging higher per-minute rates as the station's power level increases, even though there is no guarantee that the charging time will be less with a higher power level station or that the electricity delivered through a higher power level station will be more than through a lower power level, for the same amount of time.

RESPONSE:

BC Hydro is unable to fully assess the fairness of the rates for different station power levels until we complete the evaluation proposed in section 5 of the Application, as this is when we will have demand and energy data required to analyze the cost of service by station power level.

However, we note that it is more costly for BC Hydro to provide service at a 100 kW station than it is at a 25 kW station, even if electric vehicles do not draw the full power available at a station. This is because BC Hydro's costs are influenced by the amount of electricity capacity made available for a given service, and BC Hydro makes more electrical capacity available at a 100 kW station than it does at a 25 kW station. It is therefore fair to charge a higher rate at a station with a higher power level.

8.0 C. RATE DESIGN

Reference: RATE DESIGN
Exhibit B-1, Section 2.1, p. 10 and Section 4.1, p. 25;
Petro-Canada website, Electric Highway section
Single rate versus differentiated rates

On page 10 of the Application, BC Hydro notes that "the time required to charge an EV will also be dependent on what the vehicle can accept and, in many cases, a similar amount of electricity is dispensed from a 25 kW, 50 kW or 100 kW stations once the battery exceeds 90 per cent capacity".

1.8.7 Has BC Hydro considered a minimum charge at the start, followed by an energy charge once the EV begins charging. If so, why was this rate design alternative rejected.

RESPONSE:

BC Hydro did consider a minimum charge; however, given these are BC Hydro's first rates for electric vehicle fast charging services and we have no data on how Customers may respond to them, we determined a simpler rate design as proposed in the Application is preferable at this time.

In addition, our EV Network billing system is currently not capable of facilitating this type of fee structure.

Once BC Hydro has more data of electric vehicle charging at its fast charging stations, including how Customers may respond to the Proposed Rates, we may consider introducing more sophisticated pricing designs, such as a minimum charge.

8.0 C. RATE DESIGN

Reference: RATE DESIGN
Exhibit B-1, Section 2.1, p. 10 and Section 4.1, p. 25;
Petro-Canada website, Electric Highway section
Single rate versus differentiated rates

On page 10 of the Application, BC Hydro notes that "the time required to charge an EV will also be dependent on what the vehicle can accept and, in many cases, a similar amount of electricity is dispensed from a 25 kW, 50 kW or 100 kW stations once the battery exceeds 90 per cent capacity".

1.8.7 Has BC Hydro considered a minimum charge at the start, followed by an energy charge once the EV begins charging. If so, why was this rate design alternative rejected.

1.8.7.1 What are the pros and cons of such a rate design?

RESPONSE:

Please refer to BC Hydro's response to BCUC IR 1.8.7 where we describe that BC Hydro does not have enough experience with rates for fast charging service at this time to fully assess such a design.

Directionally, the implementation of a minimum charge should improve cost reflectivity and fair allocation of costs, relative to a time-based rate only. However, it would like also increase complexity of administration and may have more potential for controversy and customer complaints.

9.0 C. RATE DESIGN

Reference: RATE DESIGN
Tesla website, Supercharging section1
Tiered rate structure

On the Supercharging section of its website, Tesla states:

> Below are additional program details which apply to Tesla vehicles under the Supercharger program.
>
> - Where possible, owners are billed per kWh (kilowatt-hour), which is the most fair and simple method. In other areas, we bill for the service per minute.
> - When billing per minute, there are two tiers to account for changes in charging speeds, called "tier 1" and "tier 2".
>   - Tier 1 applies while cars are charging at or below 60 kW and tier 2 applies while cars are charging above 60 kW. Tier 1 is half the cost of tier 2.
>   - Tier 1 also applies anytime your vehicle is sharing Supercharger power with another car.
> - Pricing to use a Supercharger may vary by location, and prices may change from time to time. All prices include taxes and fees.
>
> **Why do some locations bill per kWh and some per minute?**
> Tesla believes that owners should pay for energy delivered to the vehicle and therefore we price the service on a per kilowatt-hour (kWh) basis for the global network. In some regions, regulations and requirements make it difficult for companies that are not utilities to sell electricity for vehicle charging per kWh. In these places, we offer the Supercharger service at a per minute price, with two tiers to account for the dynamic charge rate.

1.9.1 Considering that the charging speed can vary within one charging session and typically slows down as the battery nears its full capacity, has BC Hydro considered introducing a tiered rate similar to Tesla's to account for the non-linear nature of charging (for example, Tier 3 at $0.27/min while cars are charging above 50 kW, which gets reduced to Tier 2 at $0.21/min while cars are charging above 25 kW and at or below 50 kW and further reduced to Tier 1 at $0.12/min while cars are charging at or below 25 kW)? If not, please explain why not. If yes, please explain why BC Hydro chose not to pursue this option.

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[1] https://www.tesla.com/en_CA/support/supercharging#v3 [retrieved on April 16, 2021]

RESPONSE:

BC Hydro has not considered introducing the tiered rate described in the question. The tiered rate described appears to be a combination of an electricity and time-based rate. As described in section 2.2 of the Application, BC Hydro is unable to implement an electricity-based rate at this time.

9.0 C. RATE DESIGN

Reference: RATE DESIGN
Tesla website, Supercharging section[1]
Tiered rate structure

On the Supercharging section of its website, Tesla states:

> Below are additional program details which apply to Tesla vehicles under the Supercharger program.
>
> - Where possible, owners are billed per kWh (kilowatt-hour), which is the most fair and simple method. In other areas, we bill for the service per minute.
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>   - Tier 1 applies while cars are charging at or below 60 kW and tier 2 applies while cars are charging above 60 kW. Tier 1 is half the cost of tier 2.
>   - Tier 1 also applies anytime your vehicle is sharing Supercharger power with another car.
> - Pricing to use a Supercharger may vary by location, and prices may change from time to time. All prices include taxes and fees.
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1.9.1 Considering that the charging speed can vary within one charging session and typically slows down as the battery nears its full capacity, has BC Hydro considered introducing a tiered rate similar to Tesla's to account for the non-linear nature of charging (for example, Tier 3 at $0.27/min while cars are charging above 50 kW, which gets reduced to Tier 2 at $0.21/min while cars are charging above 25 kW and at or below 50 kW and further reduced to Tier 1 at $0.12/min while cars are charging at or below 25 kW)? If not, please explain why not. If yes, please explain why BC Hydro chose not to pursue this option.

1.9.1.1 Please discuss the pros and cons of such a rate design.

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[1] https://www.tesla.com/en_CA/support/supercharging#v3 [retrieved on April 16, 2021]

RESPONSE:

The rate described in the question of BCUC IR 1.9.1 is not feasible for BC Hydro to implement at this time as it would require metering and billing based on the electricity dispensed to the vehicle, which is not currently available to BC Hydro as described in section 2.2 of the Application.

Based on the information provided in the preamble, the design described in the question of BCUC IR 1.9.1 may improve cost reflectivity relative to a time only based rate, in particular for service to a vehicle that can take a wide range of peak demand. However, the rate design appears fairly complex, which would add to implementation cost and may increase the probability of controversy and customer complaints.

9.0 C. RATE DESIGN

Reference: RATE DESIGN
Tesla website, Supercharging section1
Tiered rate structure

On the Supercharging section of its website, Tesla states:

> Below are additional program details which apply to Tesla vehicles under the Supercharger program.
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>   - Tier 1 applies while cars are charging at or below 60 kW and tier 2 applies while cars are charging above 60 kW. Tier 1 is half the cost of tier 2.
>   - Tier 1 also applies anytime your vehicle is sharing Supercharger power with another car.
> - Pricing to use a Supercharger may vary by location, and prices may change from time to time. All prices include taxes and fees.
>
> **Why do some locations bill per kWh and some per minute?**
> Tesla believes that owners should pay for energy delivered to the vehicle and therefore we price the service on a per kilowatt-hour (kWh) basis for the global network. In some regions, regulations and requirements make it difficult for companies that are not utilities to sell electricity for vehicle charging per kWh. In these places, we offer the Supercharger service at a per minute price, with two tiers to account for the dynamic charge rate.

1.9.2 Would a tiered rate structure improve or worsen the rate design performance based on the Bonbright principles? Please explain.

RESPONSE:

As BC Hydro has not considered the rate design described in the question of BCUC IR 1.9.1, we are unable to complete a Bonbright assessment of it. To complete a Bonbright assessment, we would need to understand how the pricing and rate design relates to factors such as BC Hydro's costs of service and customer expectations.

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[1] https://www.tesla.com/en_CA/support/supercharging#v3 [retrieved on April 16, 2021]

Directionally, this rate design appears to have lower performance on the Bonbright criteria of rate stability, and practical and cost effective to implement relative to a time-base rate. It may have better performance in fair allocation of costs then a time-based rate.

9.0 C. RATE DESIGN

Reference: RATE DESIGN
Tesla website, Supercharging section[1]
Tiered rate structure

On the Supercharging section of its website, Tesla states:

> Below are additional program details which apply to Tesla vehicles under the Supercharger program.
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> - Where possible, owners are billed per kWh (kilowatt-hour), which is the most fair and simple method. In other areas, we bill for the service per minute.
> - When billing per minute, there are two tiers to account for changes in charging speeds, called "tier 1" and "tier 2".
>   - Tier 1 applies while cars are charging at or below 60 kW and tier 2 applies while cars are charging above 60 kW. Tier 1 is half the cost of tier 2.
>   - Tier 1 also applies anytime your vehicle is sharing Supercharger power with another car.
> - Pricing to use a Supercharger may vary by location, and prices may change from time to time. All prices include taxes and fees.
>
> **Why do some locations bill per kWh and some per minute?**
> Tesla believes that owners should pay for energy delivered to the vehicle and therefore we price the service on a per kilowatt-hour (kWh) basis for the global network. In some regions, regulations and requirements make it difficult for companies that are not utilities to sell electricity for vehicle charging per kWh. In these places, we offer the Supercharger service at a per minute price, with two tiers to account for the dynamic charge rate.

1.9.3 Please confirm, or otherwise explain, that it would be technically feasible for BC Hydro to implement a tiered rate structure at all its fast charging stations, regardless of power level (i.e., it would be the same tiers applied to a 25 kW, 50 kW or 100 kW stations, as applicable).

RESPONSE:

At this time, BC Hydro's EV network billing platform, built by AddEnergie Technologies, is not capable of accommodating a tiered, dynamic rate structure for an individual fast charging station. For example, it is not currently capable of billing a 25 kW rate at a 100 kW fast charging station if the maximum power the vehicle can accept does not exceed 25 kW. The single 100 kW per-minute rate would apply at a 100 kW charging station.

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1 https://www.tesla.com/en_CA/support/supercharging#v3 [retrieved on April 16, 2021]

9.0 C. RATE DESIGN

Reference: RATE DESIGN
Tesla website, Supercharging section[1]
Tiered rate structure

On the Supercharging section of its website, Tesla states:

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>   - Tier 1 also applies anytime your vehicle is sharing Supercharger power with another car.
> - Pricing to use a Supercharger may vary by location, and prices may change from time to time. All prices include taxes and fees.
>
> **Why do some locations bill per kWh and some per minute?**
> Tesla believes that owners should pay for energy delivered to the vehicle and therefore we price the service on a per kilowatt-hour (kWh) basis for the global network. In some regions, regulations and requirements make it difficult for companies that are not utilities to sell electricity for vehicle charging per kWh. In these places, we offer the Supercharger service at a per minute price, with two tiers to account for the dynamic charge rate.

1.9.3 Please confirm, or otherwise explain, that it would be technically feasible for BC Hydro to implement a tiered rate structure at all its fast charging stations, regardless of power level (i.e., it would be the same tiers applied to a 25 kW, 50 kW or 100 kW stations, as applicable).

1.9.3.1 Would it be costly to implement relative to the current proposed rates?

RESPONSE:

BC Hydro currently does not have a cost estimate from our technology vendor to implement a tiered rate structure for an individual fast charging station, based on the kW output to the vehicle during a Charging Session.

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1 https://www.tesla.com/en_CA/support/supercharging#v3 [retrieved on April 16, 2021].

9.0 C. RATE DESIGN

Reference: RATE DESIGN
Tesla website, Supercharging section[1]
Tiered rate structure

On the Supercharging section of its website, Tesla states:

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>   - Tier 1 applies while cars are charging at or below 60 kW and tier 2 applies while cars are charging above 60 kW. Tier 1 is half the cost of tier 2.
>   - Tier 1 also applies anytime your vehicle is sharing Supercharger power with another car.
> - Pricing to use a Supercharger may vary by location, and prices may change from time to time. All prices include taxes and fees.
>
> **Why do some locations bill per kWh and some per minute?**
> Tesla believes that owners should pay for energy delivered to the vehicle and therefore we price the service on a per kilowatt-hour (kWh) basis for the global network. In some regions, regulations and requirements make it difficult for companies that are not utilities to sell electricity for vehicle charging per kWh. In these places, we offer the Supercharger service at a per minute price, with two tiers to account for the dynamic charge rate.

1.9.4 Please revise the Tesla entry in Table 2 of the Application to reflect the fact that the tiered rate structure applies to all Superchargers stations (72 kW, 150 kW and 250 kW) and is a dynamic pricing structure which changes as the power level decreases during a charging session.[2]

RESPONSE:

Please see below for an updated version of Table 2 of the Application with the requested information added. This response also addressed BCUC IR 1.9.5.

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1 https://www.tesla.com/en_CA/support/supercharging#v3 [retrieved on April 16, 2021]
2 https://www.tesla.com/en_CA/support/supercharging [retrieved on April 16, 2021]

Operator	Service	Rate (cents/min) @ Power Level	Number of Sites and Fast Chargers in B.C.
City of North Vancouver	**Single 50 kW charger**	**20 ¢ 50 kW**	• **1 site** • **1 charger**
City of Vancouver	**Single or 2 x 50 kW chargers**	**21¢ 50 kW**	• **5 sites** • **9 chargers**
Electrify Canada	**4 x chargers up to 350 kW** **Ample lighting, major retail parking lots**	**27¢ <90kW*** **57¢ >90kW*** ***20% member discount available for $4/month**	• **3 sites (additional five sites under construction)** • **12 chargers**
FortisBC	**Single or 2 x 50 kW chargers**	**<u>Current</u>:** **30 ¢ 50 kW** **<u>Proposed</u>:** **27 ¢ 50 kW** **54 ¢ 100 kW**	• **15 sites** • **20 chargers**
Hydro Quebec Electric Circuit Network	**Basic to high quality stations** **Single, 2 x, 4 x, 6 x – 50 kW, and some 100 kW**	**20.1 ¢ 50 kW** **20.1 ¢ 100 kW[1]**	• **~250 sites in Quebec**
Petro-Canada	**2 x chargers up to 350 kW** **Ample lighting, on-site amenities/staff**	**27¢ up to 350 kW**	• **12 sites** • **23 chargers**
Tesla	**Proprietary stations (Tesla only)** **Many chargers per site**	**22 ¢ <60 kW[2]** **44 ¢ >60 kW[2]**	• **16 sites[3]** • **172 chargers[3]**

1. **Interim rate.**
2. **The tiered rate structure applies to all Superchargers stations (72 kW, 150 kW and 250 kW) and is a dynamic pricing structure which changes as the power level decreases during a charging session.**
3. **As of April 19, 2021, the Tesla website currently shows 18 supercharger locations in B.C.**

9.0 C. RATE DESIGN

Reference: RATE DESIGN
Tesla website, Supercharging section[1]
Tiered rate structure

On the Supercharging section of its website, Tesla states:

> Below are additional program details which apply to Tesla vehicles under the Supercharger program.
>
> - Where possible, owners are billed per kWh (kilowatt-hour), which is the most fair and simple method. In other areas, we bill for the service per minute.
> - When billing per minute, there are two tiers to account for changes in charging speeds, called "tier 1" and "tier 2".
>   - Tier 1 applies while cars are charging at or below 60 kW and tier 2 applies while cars are charging above 60 kW. Tier 1 is half the cost of tier 2.
>   - Tier 1 also applies anytime your vehicle is sharing Supercharger power with another car.
> - Pricing to use a Supercharger may vary by location, and prices may change from time to time. All prices include taxes and fees.
>
> **Why do some locations bill per kWh and some per minute?**
> Tesla believes that owners should pay for energy delivered to the vehicle and therefore we price the service on a per kilowatt-hour (kWh) basis for the global network. In some regions, regulations and requirements make it difficult for companies that are not utilities to sell electricity for vehicle charging per kWh. In these places, we offer the Supercharger service at a per minute price, with two tiers to account for the dynamic charge rate.

1.9.5 While revising Table 2 with the above adjustments, please update the number of sites and stations to reflect the most recent information (for example, as of April 19, 2021, the Tesla website currently shows 18 supercharger locations in BC)[2].

RESPONSE:

Please refer to BC Hydro's response to BCUC IR 1.9.4.

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1 https://www.tesla.com/en_CA/support/supercharging#v3 [retrieved on April 16, 2021].
2 https://www.tesla.com/en_CA/findus/list/superchargers/Canada [retrieved on April 19, 2021].

10.0 C. RATE DESIGN

Reference: RATE DESIGN
Electrify Canada website, Pricing section[1]
Alternative rate structure

On the Pricing section of its website, Electrify Canada states:

DC Fast pricing is determined by the pricing plan, and the power level in which your car is placed at the beginning of the charging session. Pricing is subject to change. Please refer to the charger screen for the most up to date pricing and power levels available for your session.

First plug the charger into your vehicle. If your car tells the charger that it can accept a maximum charging power of 75kW, for example, it is placed in the "1-90kW" power level.

The power level set at the start of your session determines the per-minute price, which stays the same throughout the session.

1.10.1 Please clarify whether BC Hydro will install 25 kW or 50 kW stations alongside 100 kW stations to accommodate all makes and models of various battery size. If not, please explain why not.

RESPONSE:

Subject to having more data, government funding program criteria, availability of parking stalls at charging sites, and available electrical capacity, BC Hydro will consider installing various DC power levels (i.e., 25 kW, 50 kW and 100 kW) at some charging sites.

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[1] https://www.electrify-canada.ca/pricing/ [retrieved on April 16, 2021]

10.0 C. RATE DESIGN

Reference: RATE DESIGN
Electrify Canada website, Pricing section[1]
Alternative rate structure

On the Pricing section of its website, Electrify Canada states:

DC Fast pricing is determined by the pricing plan, and the power level in which your car is placed at the beginning of the charging session. Pricing is subject to change. Please refer to the charger screen for the most up to date pricing and power levels available for your session.

First plug the charger into your vehicle. If your car tells the charger that it can accept a maximum charging power of 75kW, for example, it is placed in the "1-90kW" power level.

The power level set at the start of your session determines the per-minute price, which stays the same throughout the session.

1.10.2 If a car's maximum charging power is 50 kW but the only station in range is a 100 kW station, can the driver still plug the car into the 100 kW charging port and start charging?

RESPONSE:

Yes, a vehicle can plug into and charge at a charging station that is rated higher than the maximum charging capability of the electric vehicle. This means for example that an electric vehicle with a maximum charge rate of 50 kW can plug into and charge at a 100 kW station. However, the maximum charge rate during the charging session will be limited to the charging capability of the vehicle itself (i.e., 50 kW).

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[1] https://www.electrify-canada.ca/pricing/ [retrieved on April 16, 2021]

10.0 C. RATE DESIGN

Reference: RATE DESIGN
Electrify Canada website, Pricing section[1]
Alternative rate structure

On the Pricing section of its website, Electrify Canada states:

DC Fast pricing is determined by the pricing plan, and the power level in which your car is placed at the beginning of the charging session. Pricing is subject to change. Please refer to the charger screen for the most up to date pricing and power levels available for your session.

First plug the charger into your vehicle. If your car tells the charger that it can accept a maximum charging power of 75kW, for example, it is placed in the "1-90kW" power level.

The power level set at the start of your session determines the per-minute price, which stays the same throughout the session.

1.10.2 If a car's maximum charging power is 50 kW but the only station in range is a 100 kW station, can the driver still plug the car into the 100 kW charging port and start charging?

1.10.2.1 If so, would it be safe to do so? Please discuss.

RESPONSE:

BC Hydro is not aware of any safety issues by doing this.

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1 https://www.electrify-canada.ca/pricing/ [retrieved on April 16, 2021]

10.0 C. RATE DESIGN

Reference: RATE DESIGN
Electrify Canada website, Pricing section[1]
Alternative rate structure

On the Pricing section of its website, Electrify Canada states:

DC Fast pricing is determined by the pricing plan, and the power level in which your car is placed at the beginning of the charging session. Pricing is subject to change. Please refer to the charger screen for the most up to date pricing and power levels available for your session.

First plug the charger into your vehicle. If your car tells the charger that it can accept a maximum charging power of 75kW, for example, it is placed in the "1-90kW" power level.

The power level set at the start of your session determines the per-minute price, which stays the same throughout the session.

1.10.2 If a car's maximum charging power is 50 kW but the only station in range is a 100 kW station, can the driver still plug the car into the 100 kW charging port and start charging?

1.10.2.2 If so, would the driver be charged at $0.27/min even if the car's maximum charging power is 50 kW?

[1] https://www.electrify-canada.ca/pricing/ [retrieved on April 16, 2021]

RESPONSE:

As shown in Appendix B of the Application, the Availability of the Proposed Rates is based on the kW of the Fast Charging Station.

The Proposed Rates are designed for stations at different power levels, irrespective of the maximum level of power a vehicle is capable of accepting. For instance, if the electric vehicle is being charged at a station with 100 kW power level, then Proposed Rate Schedule 1561, as provided in Appendix B to the Application, would apply.

10.0 C. RATE DESIGN

Reference: RATE DESIGN
Electrify Canada website, Pricing section[1]
Alternative rate structure

On the Pricing section of its website, Electrify Canada states:

DC Fast pricing is determined by the pricing plan, and the power level in which your car is placed at the beginning of the charging session. Pricing is subject to change. Please refer to the charger screen for the most up to date pricing and power levels available for your session.

First plug the charger into your vehicle. If your car tells the charger that it can accept a maximum charging power of 75kW, for example, it is placed in the "1-90kW" power level.

The power level set at the start of your session determines the per-minute price, which stays the same throughout the session.

1.10.3 Has BC Hydro considered introducing a rate like that of Electrify Canada's pricing structure, where the car tells the charger the maximum charging power that it can take, which then determines the per-minute rate for the entire session? (For example, if a car's maximum charging power is 50 kW and it plugs into a 100 kW station, the station would recognize the car's limit and BC Hydro would only charge the $0.21/min rate.) If not, please explain why not. If yes, please explain why BC Hydro chose not to pursue this option.

[1] https://www.electrify-canada.ca/pricing/ [retrieved on April 16, 2021]

RESPONSE:

BC Hydro has not considered the rate design described in the question of BCUC IR 1.10.3, as we cannot implement it at this time due to billing and metering constraints.

10.0 C. RATE DESIGN

Reference: RATE DESIGN
Electrify Canada website, Pricing section[1]
Alternative rate structure

On the Pricing section of its website, Electrify Canada states:

DC Fast pricing is determined by the pricing plan, and the power level in which your car is placed at the beginning of the charging session. Pricing is subject to change. Please refer to the charger screen for the most up to date pricing and power levels available for your session.

First plug the charger into your vehicle. If your car tells the charger that it can accept a maximum charging power of 75kW, for example, it is placed in the "1-90kW" power level.

The power level set at the start of your session determines the per-minute price, which stays the same throughout the session.

1.10.3 Has BC Hydro considered introducing a rate like that of Electrify Canada's pricing structure, where the car tells the charger the maximum charging power that it can take, which then determines the per-minute rate for the entire session? (For example, if a car's maximum charging power is 50 kW and it plugs into a 100 kW station, the station would recognize the car's limit and BC Hydro would only charge the $0.21/min rate.) If not, please explain why not. If yes, please explain why BC Hydro chose not to pursue this option.

[1] https://www.electrify-canada.ca/pricing/ [retrieved on April 16, 2021]

1.10.3.1 Please discuss the pros and cons of such a rate design.

RESPONSE:

The rate design described in the question of BCUC IR 1.10.3 is not feasible as we cannot implement it at this time due to billing and metering constraints.

Based on the information from the preamble, the design described in the question BCUC IR 1.10.3 would improve cost reflectivity relative to a time only based rate, in particular for a charging station that allows for a wide range of power to be dispensed to vehicles.

10.0 C. RATE DESIGN

Reference: RATE DESIGN
Electrify Canada website, Pricing section[1]
Alternative rate structure

On the Pricing section of its website, Electrify Canada states:

DC Fast pricing is determined by the pricing plan, and the power level in which your car is placed at the beginning of the charging session. Pricing is subject to change. Please refer to the charger screen for the most up to date pricing and power levels available for your session.

First plug the charger into your vehicle. If your car tells the charger that it can accept a maximum charging power of 75kW, for example, it is placed in the "1-90kW" power level.

The power level set at the start of your session determines the per-minute price, which stays the same throughout the session.

1.10.3 Has BC Hydro considered introducing a rate like that of Electrify Canada's pricing structure, where the car tells the charger the maximum charging power that it can take, which then determines the per-minute rate for the entire session? (For example, if a car's maximum charging power is 50 kW and it plugs into a 100 kW station, the station would recognize the car's limit and BC Hydro would only charge the $0.21/min rate.) If not, please explain why not. If yes, please explain why BC Hydro chose not to pursue this option.

[1] https://www.electrify-canada.ca/pricing/ [retrieved on April 16, 2021]

1.10.3.2 Would this alternative rate design improve or worsen the rate design performance based on the Bonbright principles? Please explain.

RESPONSE:

As BC Hydro has not considered the rate design described in the question of BCUC IR 1.10.3, we are unable to complete a Bonbright assessment of it. To complete a Bonbright assessment we would need to understand how the pricing and rate design relate to factors such as BC Hydro's costs of service and customer expectations.

Directionally, this rate design appears to have better performance on Bonbright criteria related to fair apportionment of costs relative to a time only based rate.

10.0 C. RATE DESIGN

Reference: RATE DESIGN
Electrify Canada website, Pricing section[1]
Alternative rate structure

On the Pricing section of its website, Electrify Canada states:

DC Fast pricing is determined by the pricing plan, and the power level in which your car is placed at the beginning of the charging session. Pricing is subject to change. Please refer to the charger screen for the most up to date pricing and power levels available for your session.

First plug the charger into your vehicle. If your car tells the charger that it can accept a maximum charging power of 75kW, for example, it is placed in the "1-90kW" power level.

The power level set at the start of your session determines the per-minute price, which stays the same throughout the session.

1.10.3 Has BC Hydro considered introducing a rate like that of Electrify Canada's pricing structure, where the car tells the charger the maximum charging power that it can take, which then determines the per-minute rate for the entire session? (For example, if a car's maximum charging power is 50 kW and it plugs into a 100 kW station, the station would recognize the car's limit and BC Hydro would only charge the $0.21/min rate.) If not, please explain why not. If yes, please explain why BC Hydro chose not to pursue this option.

[1] https://www.electrify-canada.ca/pricing/ [retrieved on April 16, 2021]

1.10.3.3 Please confirm, or otherwise explain, that it would be technically feasible for BC Hydro to implement such an alternative rate design at all its fast charging stations?

RESPONSE:

Please refer to BC Hydro's response to BCUC IR 1.9.3 regarding the technical feasibility of such an alternative rate design.

10.0 C. RATE DESIGN

Reference: RATE DESIGN
Electrify Canada website, Pricing section[1]
Alternative rate structure

On the Pricing section of its website, Electrify Canada states:

DC Fast pricing is determined by the pricing plan, and the power level in which your car is placed at the beginning of the charging session. Pricing is subject to change. Please refer to the charger screen for the most up to date pricing and power levels available for your session.

First plug the charger into your vehicle. If your car tells the charger that it can accept a maximum charging power of 75kW, for example, it is placed in the "1-90kW" power level.

The power level set at the start of your session determines the per-minute price, which stays the same throughout the session.

1.10.3 Has BC Hydro considered introducing a rate like that of Electrify Canada's pricing structure, where the car tells the charger the maximum charging power that it can take, which then determines the per-minute rate for the entire session? (For example, if a car's maximum charging power is 50 kW and it plugs into a 100 kW station, the station would recognize the car's limit and BC Hydro would only charge the $0.21/min rate.) If not, please explain why not. If yes, please explain why BC Hydro chose not to pursue this option.

[1] https://www.electrify-canada.ca/pricing/ [retrieved on April 16, 2021]

1.10.3.4 Would it be costly to implement relative to the current proposed rates?

RESPONSE:

BC Hydro does not have a cost estimate at this time.

11.0 C. RATE DESIGN

Reference: RATE DESIGN
Exhibit B-1, Section 4.1, p. 25 and Section 4.2, p. 29
Bill comparisons

On page 25, BC Hydro states that:

> For example, the average cost for a charging session at a BC Hydro fast charging station is $6. In comparison charging at a Tesla or Petro-Canada fast charging station may be $8 or more, while charging at home under BC Hydro's residential service rate schedule may be $2 and a tank of gasoline may be at least $20.

On page 29, BC Hydro states that, based on data collected from BC Hydro's fast charging stations from April 1, 2019 to March 31, 2020, the average electricity consumption per charging session is 13.1 kWh and the average charging session length is 28.6 minutes.

1.11.1 Please confirm, or otherwise explain, that BC Hydro used the average charging session length of 28.6 minutes from data it collected in 2019/2020 to calculate that the average cost for a charging session at a BC Hydro fast charging station is $6.

RESPONSE:

Confirmed.

11.0 C. RATE DESIGN

Reference: RATE DESIGN
Exhibit B-1, Section 4.1, p. 25 and Section 4.2, p. 29
Bill comparisons

On page 25, BC Hydro states that:

> For example, the average cost for a charging session at a BC Hydro fast charging station is $6. In comparison charging at a Tesla or Petro-Canada fast charging station may be $8 or more, while charging at home under BC Hydro's residential service rate schedule may be $2 and a tank of gasoline may be at least $20.

On page 29, BC Hydro states that, based on data collected from BC Hydro's fast charging stations from April 1, 2019 to March 31, 2020, the average electricity consumption per charging session is 13.1 kWh and the average charging session length is 28.6 minutes.

1.11.2 Please clarify what assumptions BC Hydro used to calculate that charging at home under BC Hydro's residential service rate schedule may be $2. Considering the Step 1 rate is $0.0941/kWh and the Step 2 rate is $0.1410/kWh, if BC Hydro used the average electricity consumption per charging session of 13.1 kWh from data it collected in 2019/2020, the home-charging bill would be range between $1.23 and $1.85.

RESPONSE:

BC Hydro used the fiscal 2022 Rate Schedule 1101 step-2 energy rate[1] and the average electricity consumption per charging session of 13.1 kWh from data collected in fiscal 2020. The discrepancy between the statement in the Application that home charging "may be $2" and actual value of $1.85 is due to rounding to the nearest dollar.

[1] **Fiscal 2022 Revenue Requirements Application, Appendix Y (page 3): https://www.bcuc.com/Documents/Proceedings/2020/DOC_60301_B-2-2-BCH-F22-RRA-Appendices-Public.pdf.**

11.0 C. RATE DESIGN

Reference: RATE DESIGN
Exhibit B-1, Section 4.1, p. 25 and Section 4.2, p. 29
Bill comparisons

On page 25, BC Hydro states that:

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On page 29, BC Hydro states that, based on data collected from BC Hydro's fast charging stations from April 1, 2019 to March 31, 2020, the average electricity consumption per charging session is 13.1 kWh and the average charging session length is 28.6 minutes.

1.11.3 Please clarify what assumptions (power level, targeted range for a charge, starting charge level, outdoor air temperature, etc.) BC Hydro used to calculate that charging at a Petro-Canada fast charging station may be $8 or more, considering that the CCS connector has the capability of charging up to 350 kW at most locations and the CHAdeMO connector has the capability of charging up to 100 kW.

RESPONSE:

The response also addresses BCUC IR 1.11.4.

BC Hydro utilized BC Hydro's fiscal 2020 average charging session data to calculate possible charging costs at Tesla or Petro-Canada fast charging station.

For Petro-Canada fast charging stations, BC Hydro assumed that similar to BC Hydro fast charging stations, customers with a wide range of electric vehicle models from various manufacturers would utilize their service. As such, in absence of actual data from Petro-Canada, BC Hydro assumed that BC Hydro's average charging session data described on page 29 of the Application would be reasonable to be used in this calculation.

The calculated charging rate at Petro-Canada fast charging station is then rounded to $8 from $7.72, using the following formula:

= (Average charging session length) X (Petro-Canada fast charging rate)

= (26.8 minutes) x (27 cents per minutes)

= $7.72

For Tesla fast charging stations, BC Hydro assumed that an average charging session length of 28.6 minutes per BC Hydro's average charging session data is reasonable for the purpose of this fast charging service cost comparison as it is less than stated Tesla's "average Supercharging session lasting around 45 to 50 minutes in city centers".[1] Unlike BC Hydro and Petro-Canada fast charging station rates, Tesla supercharging rate has a tiered structure. To address this and in absence of actual data from Tesla, BC Hydro proportioned one-quarter of the charging session taking place at the higher tier two of 44 cents per minute (while the vehicles would be charging above 60 kW) and three-quarter of the charging session at tier one of 22 cents per minute (while the vehicles would be charging at or below 60 kW or would be sharing Supercharging power) for more conservative estimated cost to charge.

The calculated charging at a Tesla supercharging station is then rounded to $8, from $7.87, using the following formula:

= [(Average Charging Session Length) X (25%) X (Tesla tier 2 supercharger rate)] + [(Average Charging Session Length) X (75%) X (Tesla tier 1 supercharger rate)]

= [(28.6 minutes) X (25%) X (44 cents per minute)] + [(28.6 minutes) X (75%) X (22 cents per minute)]

= $7.87

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[1] **Tesla website: https://www.tesla.com/en_CA/support/supercharging.**

11.0 C. RATE DESIGN

Reference: RATE DESIGN
Exhibit B-1, Section 4.1, p. 25 and Section 4.2, p. 29
Bill comparisons

On page 25, BC Hydro states that:

> For example, the average cost for a charging session at a BC Hydro fast charging station is $6. In comparison charging at a Tesla or Petro-Canada fast charging station may be $8 or more, while charging at home under BC Hydro's residential service rate schedule may be $2 and a tank of gasoline may be at least $20.

On page 29, BC Hydro states that, based on data collected from BC Hydro's fast charging stations from April 1, 2019 to March 31, 2020, the average electricity consumption per charging session is 13.1 kWh and the average charging session length is 28.6 minutes.

1.11.4 Please clarify what assumptions (power level, targeted range for a charge, starting charge level, outdoor air temperature, etc.) BC Hydro used to calculate that charging at a Tesla fast charging station may be $8 or more, considering that the rate charged by Tesla at its Superchargers is a non linear two-tier rate (Tier 1 of $0.22/min while cars are charging at or below 60 kW or sharing Supercharging power and Tier 2 of $0.44/min while cars are charging above 60 kW).

RESPONSE:

Please refer to BC Hydro's response to BCUC IR 1.11.3.

11.0 C. RATE DESIGN

Reference: RATE DESIGN
Exhibit B-1, Section 4.1, p. 25 and Section 4.2, p. 29
Bill comparisons

On page 25, BC Hydro states that:

> For example, the average cost for a charging session at a BC Hydro fast charging station is $6. In comparison charging at a Tesla or Petro-Canada fast charging station may be $8 or more, while charging at home under BC Hydro's residential service rate schedule may be $2 and a tank of gasoline may be at least $20.

On page 29, BC Hydro states that, based on data collected from BC Hydro's fast charging stations from April 1, 2019 to March 31, 2020, the average electricity consumption per charging session is 13.1 kWh and the average charging session length is 28.6 minutes.

1.11.5 Has BC Hydro conducted real-life experiments to charge an EV at various networks under the same conditions to be able to compare bills? If so, please provide a summary of the results of this experiment.

RESPONSE:

BC Hydro has not conducted real-life experiments to charge an electric vehicle at various networks under the same conditions to be able to compare bills.

11.0 C. RATE DESIGN

Reference: RATE DESIGN
Exhibit B-1, Section 4.1, p. 25 and Section 4.2, p. 29
Bill comparisons

On page 25, BC Hydro states that:

> For example, the average cost for a charging session at a BC Hydro fast charging station is $6. In comparison charging at a Tesla or Petro-Canada fast charging station may be $8 or more, while charging at home under BC Hydro's residential service rate schedule may be $2 and a tank of gasoline may be at least $20.

On page 29, BC Hydro states that, based on data collected from BC Hydro's fast charging stations from April 1, 2019 to March 31, 2020, the average electricity consumption per charging session is 13.1 kWh and the average charging session length is 28.6 minutes.

1.11.5 Has BC Hydro conducted real-life experiments to charge an EV at various networks under the same conditions to be able to compare bills? If so, please provide a summary of the results of this experiment.

1.11.5.1 If not, please explain why not.

RESPONSE:

Until May 1, 2021, BC Hydro's public fast charging service was offered at no charge. Therefore, an experiment that involved comparison of bills was not feasible.

11.0 C. RATE DESIGN

Reference: RATE DESIGN
Exhibit B-1, Section 4.1, p. 25 and Section 4.2, p. 29
Bill comparisons

On page 25, BC Hydro states that:

> For example, the average cost for a charging session at a BC Hydro fast charging station is $6. In comparison charging at a Tesla or Petro-Canada fast charging station may be $8 or more, while charging at home under BC Hydro's residential service rate schedule may be $2 and a tank of gasoline may be at least $20.

On page 29, BC Hydro states that, based on data collected from BC Hydro's fast charging stations from April 1, 2019 to March 31, 2020, the average electricity consumption per charging session is 13.1 kWh and the average charging session length is 28.6 minutes.

1.11.5 Has BC Hydro conducted real-life experiments to charge an EV at various networks under the same conditions to be able to compare bills? If so, please provide a summary of the results of this experiment.

1.11.5.2 Would BC Hydro (or its subsidiary Powertech Labs Inc.) be able to conduct such an experiment and provide the results as an evidentiary update to the BCUC?

RESPONSE:

BC Hydro does not support conducting the experiment described and providing the results as an evidentiary update to the BCUC. Rather, in the interest of regulatory efficiency, BC Hydro suggests including information on the distribution and characteristics of the bills of public electric vehicle fast charging service Customers in our planned evaluation to be filed with the BCUC by March 31, 2024.

11.0 C. RATE DESIGN

Reference: RATE DESIGN
Exhibit B-1, Section 4.1, p. 25 and Section 4.2, p. 29
Bill comparisons

On page 25, BC Hydro states that:

> For example, the average cost for a charging session at a BC Hydro fast charging station is $6. In comparison charging at a Tesla or Petro-Canada fast charging station may be $8 or more, while charging at home under BC Hydro's residential service rate schedule may be $2 and a tank of gasoline may be at least $20.

On page 29, BC Hydro states that, based on data collected from BC Hydro's fast charging stations from April 1, 2019 to March 31, 2020, the average electricity consumption per charging session is 13.1 kWh and the average charging session length is 28.6 minutes.

1.11.6 Please clarify what assumptions (fuel economy L/100 km, price per Litre, targeted range for a charge) BC Hydro used to compare these EV charging bills to a gas bill of $20? Is the gas bill inclusive of all taxes?

RESPONSE:

BC Hydro used following assumptions and the formula for the calculation of gas bill of $20:

	Values	Units
Canada's average vehicle fuel efficiency[1]	**8.9**	**L/100km**
60 per cent of typical electric vehicle range[2]	**180**	**km**

[1] **Canada Energy Regulator (CER): "In 2017, Canada's average vehicle ranked last in fuel efficiency, consuming an average of 8.9 litres of gasoline per 100 kilometres (L/100km)." https://www.cer-rec.gc.ca/en/data-analysis/energy-markets/market-snapshots/2019/market-snapshot-how-does-canada-rank-in-terms-vehicle-fuel-economy.html#:~:text=In%202017%2C%20Canada's%20average,kilometres%20(L%2F100km).&text=In%20comparison%2C%20fuel%20consumption%20averaged,4.9%20L%2F100km%20in%20Portugal**

[2] **PlugIn BC: "Most electric cars have a range of 300-600km per charge (For reference: most of us drive an average of 20km a day)." https://pluginbc.ca/ev101/#:~:text=Electric%20cars%20can%20go%20the,average%20of%2020km%20a%20day**

	Values	Units
Average retail gas price in B.C.[3]	**1.30**	**$/L**

Formula

(Canada's average vehicle fuel efficiency) X (60% of typical electric vehicle range) X (Average retail gas price in BC)

= (8.9 L/100km) x (60% x 300km) x ($1.30/L)

= $20.83

Actual value of $20.83 is rounded down to the nearest dollar of $20.

[3] **GasBuddy average B.C. retail gas price of 130 cents per litre from February 26, 2021: https://gasbuddy.com**

12.0 C. RATE DESIGN

Reference: RATE DESIGN
Exhibit B-1, Section 4.1, p. 28 and Section 2.1, p. 11
Separate rate schedules for each charging station power level

On page 28, BC Hydro states:

> Having separate Rate Schedules for each fast charging station power level service will allow BC Hydro to conduct the analysis of utilization, electricity load characteristics, costs and revenues for the purpose of the evaluation described in section 5 below. As explained in section 2.2 above, the fast charging service will be separately metered at the site level, and BC Hydro can track data on electricity use and revenue by Rate Schedule. In this respect, the Proposed Rates are consistent with the BCUC's recommendation in the Phase 2 EV Inquiry Report that non-exempt public utilities should develop a separate rate and tariff for fast charging service.

On page 11, BC Hydro states:

> BC Hydro maintains a number of 25 kW stations in inventory, mainly as temporary replacements of 50 kW stations undergoing maintenance and repair, when replacement parts for the 50 kW stations are not readily available or the stations cannot be repaired on-site. A 25 kW station may be temporarily installed to maintain fast charging availability at the site.

1.12.1 Please describe the electricity load characteristics of EV charging and how they are expected to differ by power level.

RESPONSE:

BC Hydro has not conducted load characteristics studies by comparing 50 kW and 25 kW charging stations.

The following are the electrical input specifications of the types of BC Hydro fast charging stations currently in operation:

- **50 kW AddEnergie SmartDC V2 – Input specification: 480 VAC, 3-phase, Maximum input current 67 A;**
- **50 kW AddEnergie SmartDC V3 – Input specification: 480 VAC, 3-phase, Maximum input current 65 A;**

- **50 kW ABB Terra 53 – Input specification: 480VAC, 3-phase, Maximum input current 75 A;**
- **50 kW ABB Terra 54 – Input specification: 480 VAC, 3-phase, Maximum input current 80 A; and**
- **25 kW ABB DC Wallbox – Input specification: 240 VAC, 1-phase, Maximum input current 100 A.**

For information on electrical output and charging times between 50 kW and 25 kW charging stations, please refer to the following article: https://chargedevs.com/features/case-25-kw-dc-quick-chargers/

From the period April 1, 2020 to March 31, 2021 (fiscal 2021), the averages per charging session at a 50 kW charging station were as follows:

- **Session Length - 29.6 mins; and**
- **Electricity Dispensed - 14.9 kWh.**

12.0 C. RATE DESIGN

Reference: RATE DESIGN
Exhibit B-1, Section 4.1, p. 28 and Section 2.1, p. 11
Separate rate schedules for each charging station power level

On page 28, BC Hydro states:

> Having separate Rate Schedules for each fast charging station power level service will allow BC Hydro to conduct the analysis of utilization, electricity load characteristics, costs and revenues for the purpose of the evaluation described in section 5 below. As explained in section 2.2 above, the fast charging service will be separately metered at the site level, and BC Hydro can track data on electricity use and revenue by Rate Schedule. In this respect, the Proposed Rates are consistent with the BCUC's recommendation in the Phase 2 EV Inquiry Report that non-exempt public utilities should develop a separate rate and tariff for fast charging service.

On page 11, BC Hydro states:

> BC Hydro maintains a number of 25 kW stations in inventory, mainly as temporary replacements of 50 kW stations undergoing maintenance and repair, when replacement parts for the 50 kW stations are not readily available or the stations cannot be repaired on-site. A 25 kW station may be temporarily installed to maintain fast charging availability at the site.

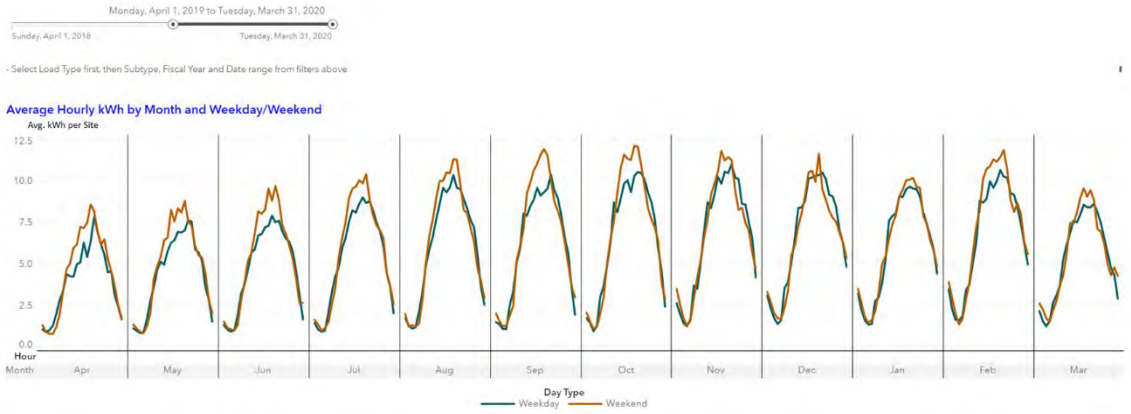
1.12.2 Please provide the actual electricity load characteristics by power level from the data BC Hydro collected from April 1, 2019 to March 31, 2020. If this data can also be presented as graphs or tables for readability, please provide them. If BC Hydro has access to more recent data than March 31, 2020, please include it in the response.

RESPONSE:

The load characteristics for the period from April 1, 2019 to March 31, 2020 are shown below based on the site-level metering information. Load characteristics for 50 kW power level charging stations based for the period of April 1, 2020 to March 31, 2021 are shown below based on the energy dispensed to the vehicle according to the measurement device built into the station.

For the period between April 1, 2019 and March 31, 2020, based on the site-level metering information for the average hourly kWh information is provided in a

graphic form below. In terms of aggregate peak hourly kWh, the peak occurred on October 20, 2019 at 4 p.m. at 915 kW.



Note to graph:

- **Most sites had a single 50 kW charging station during this period, and a few sites and two 50 kW charging stations on the same site-level meter;**
- **Up to four sites also had a level 2 charging station on the same site-level meter; and a few sites had a second 50 kW charging station; and**
- **Weekend vs. weekday granularity has been added.**

For the period from April 1, 2020 to March 31, 2021:

The load characteristics are as follows:

- **Energy Dispensed to electric vehicles: 4,146,500 kWh**
- **Duration of Connections: 8,231,382 minutes**
- **Averages per charging session:**
  - **29.6 mins**
  - **14.9 kWh**

Based on the following information:

- **83 operating DCFC's, and 79 DCFC's reporting data on April 2020;**
- **97 operating DCFC's, and 97 DCFC's reporting data on March 31, 2021; and**
- **279,167 Charging Sessions.**

12.0 C. RATE DESIGN

Reference: RATE DESIGN
Exhibit B-1, Section 4.1, p. 28 and Section 2.1, p. 11
Separate rate schedules for each charging station power level

On page 28, BC Hydro states:

> Having separate Rate Schedules for each fast charging station power level service will allow BC Hydro to conduct the analysis of utilization, electricity load characteristics, costs and revenues for the purpose of the evaluation described in section 5 below. As explained in section 2.2 above, the fast charging service will be separately metered at the site level, and BC Hydro can track data on electricity use and revenue by Rate Schedule. In this respect, the Proposed Rates are consistent with the BCUC's recommendation in the Phase 2 EV Inquiry Report that non-exempt public utilities should develop a separate rate and tariff for fast charging service.

On page 11, BC Hydro states:

> BC Hydro maintains a number of 25 kW stations in inventory, mainly as temporary replacements of 50 kW stations undergoing maintenance and repair, when replacement parts for the 50 kW stations are not readily available or the stations cannot be repaired on-site. A 25 kW station may be temporarily installed to maintain fast charging availability at the site.

1.12.3 When one 50 kW station is temporarily replaced with a 25 kW station due to repair, at a site where other 50 kW stations are operational, how will BC Hydro be able to meter the electricity used by the 50 kW station separately from the 25 kW station for its analysis and evaluation purpose, considering it meters the fast charging service at the site level? Please elaborate.

RESPONSE:

There will not be any changes to site-level metering when 50 kW stations are temporarily replaced with 25 kW stations. One BC Hydro site-level meter is located upstream of all electrical equipment, including one or more charging stations.

In addition to tracking electricity usage at the revenue meter for the entire site, BC Hydro also tracks electricity usage of the 25 kW unit at the station level, using the measurement device built into the station.

12.0 C. RATE DESIGN

Reference: RATE DESIGN
Exhibit B-1, Section 4.1, p. 28 and Section 2.1, p. 11
Separate rate schedules for each charging station power level

On page 28, BC Hydro states:

> Having separate Rate Schedules for each fast charging station power level service will allow BC Hydro to conduct the analysis of utilization, electricity load characteristics, costs and revenues for the purpose of the evaluation described in section 5 below. As explained in section 2.2 above, the fast charging service will be separately metered at the site level, and BC Hydro can track data on electricity use and revenue by Rate Schedule. In this respect, the Proposed Rates are consistent with the BCUC's recommendation in the Phase 2 EV Inquiry Report that non-exempt public utilities should develop a separate rate and tariff for fast charging service.

On page 11, BC Hydro states:

> BC Hydro maintains a number of 25 kW stations in inventory, mainly as temporary replacements of 50 kW stations undergoing maintenance and repair, when replacement parts for the 50 kW stations are not readily available or the stations cannot be repaired on-site. A 25 kW station may be temporarily installed to maintain fast charging availability at the site.

1.12.4 Considering it can take up to twice as long to charge at a 25 kW station relative to a 50 kW station, these temporary replacements may be viewed by drivers as less desirable if they are looking for a fast charge. Please discuss whether these temporary replacement of lower capacity level could affect drivers' behaviour once they discover the 50 kW station has been replaced by a 25 kW station (e.g., reduce the charging time to the minimum required to get to the next 50 kW station, not use it at all), in turn affecting the usage data BC Hydro plans to collect.

RESPONSE:

BC Hydro does not have data on whether it impacts drivers' behaviour, but anecdotal evidence from customers' posts on PlugShare shows the temporary replacement can be less desirable from a driver perspective.

In instances where a 50 kW station cannot be repaired onsite or parts are not readily available, it is more efficient and cost effective to use a 25 kW station as a temporary replacement as they are smaller, are easier to transport, and require lower inventory cost and less for installation (e.g., 50 kW stations require a truck with a crane for installation).

12.0 C. RATE DESIGN

Reference: RATE DESIGN
Exhibit B-1, Section 4.1, p. 28 and Section 2.1, p. 11
Separate rate schedules for each charging station power level

On page 28, BC Hydro states:

> Having separate Rate Schedules for each fast charging station power level service will allow BC Hydro to conduct the analysis of utilization, electricity load characteristics, costs and revenues for the purpose of the evaluation described in section 5 below. As explained in section 2.2 above, the fast charging service will be separately metered at the site level, and BC Hydro can track data on electricity use and revenue by Rate Schedule. In this respect, the Proposed Rates are consistent with the BCUC's recommendation in the Phase 2 EV Inquiry Report that non-exempt public utilities should develop a separate rate and tariff for fast charging service.

On page 11, BC Hydro states:

> BC Hydro maintains a number of 25 kW stations in inventory, mainly as temporary replacements of 50 kW stations undergoing maintenance and repair, when replacement parts for the 50 kW stations are not readily available or the stations cannot be repaired on-site. A 25 kW station may be temporarily installed to maintain fast charging availability at the site.

1.12.5 Is BC Hydro planning to inform customers of the change in charger power level (from 50 kW to 25 kW) on its EV App and all other Apps that show the BC Hydro fast chargers so that drivers know what to expect and plan accordingly? If not, why not?

RESPONSE:

The power level listed in all Apps will change when different stations are registered into the system.

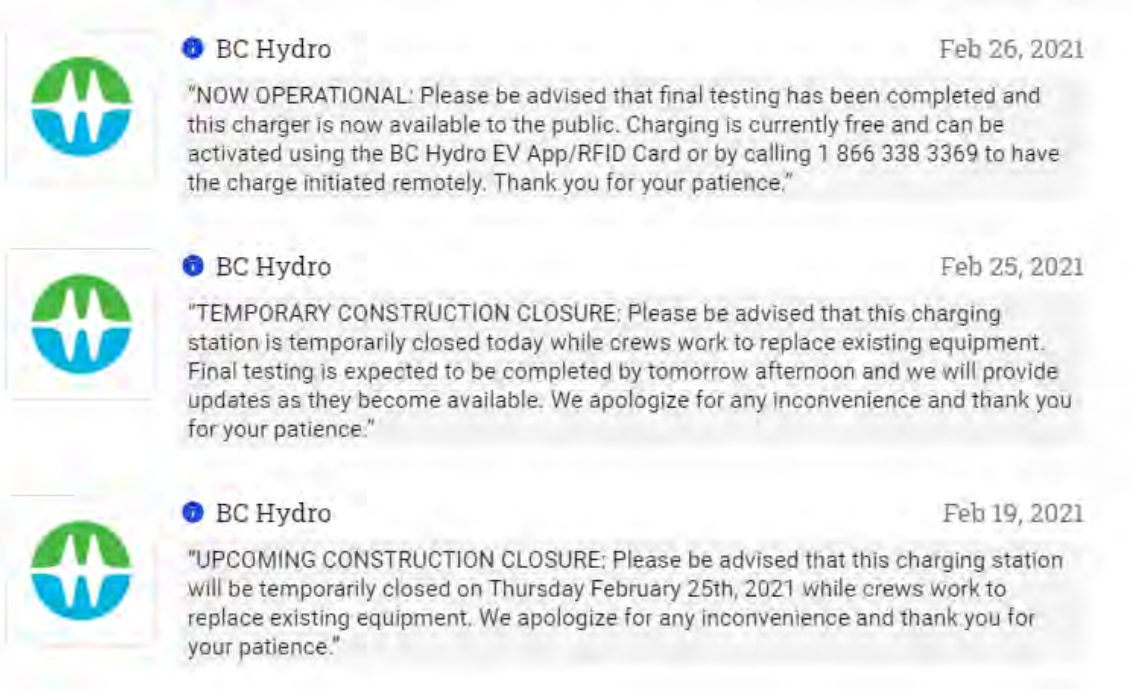
The BC Hydro EV Mobile App currently does not have the capability to provide station-specific messaging in text form. BC Hydro actively uses PlugShare and ChargeHub to provide information on any planned or unplanned outages and station status changes. BC Hydro also provides information, using PlugShare and ChargeHub, when there is a change in power level for a charging stations at a specific site. The following are some examples of different messages posted on PlugShare.

Description of the charging station at Squamish:

BC Hydro dual-standard 25 kW DC charger (one vehicle at a time), located curb-side, northbound lane. Map marker location is precise. Charger can be activated using the BC Hydro EV App/RFID Card or by calling 1-866-338-3369 to have the charge initiated remotely. FLO App/RFID Card and ChargePoint App also supported. Download our app by searching BC Hydro EV in Apple Store or Google Play More info on BC Hydro EV app at ev.bchydro.com *A friendly reminder that parking against the flow of traffic is not permitted in the District of Squamish, please follow all traffic laws when charging your vehicle at this station.*

Information on interim 25 kW charging station replacement:

Information on hardware replacement:



BC Hydro — Feb 26, 2021

"NOW OPERATIONAL: Please be advised that final testing has been completed and this charger is now available to the public. Charging is currently free and can be activated using the BC Hydro EV App/RFID Card or by calling 1 866 338 3369 to have the charge initiated remotely. Thank you for your patience."

BC Hydro — Feb 25, 2021

"TEMPORARY CONSTRUCTION CLOSURE: Please be advised that this charging station is temporarily closed today while crews work to replace existing equipment. Final testing is expected to be completed by tomorrow afternoon and we will provide updates as they become available. We apologize for any inconvenience and thank you for your patience."

BC Hydro — Feb 19, 2021

"UPCOMING CONSTRUCTION CLOSURE: Please be advised that this charging station will be temporarily closed on Thursday February 25th, 2021 while crews work to replace existing equipment. We apologize for any inconvenience and thank you for your patience."

13.0 C. RATE DESIGN

Reference: RATE DESIGN
Exhibit B-1, Section 4.2, pp. 28–30; Vancouver Sun article dated March 31, 2021: "B.C. tops North America for electric vehicle uptake in 2020, says minister"[1]
Assumptions used in cost recovery calculations

BC Hydro separates the cost of service into three components: electricity costs, station maintenance costs, and station capital costs.

BC Hydro estimates those costs using three equations that rely on known variables, like peak demand, demand charge, energy charge, annual maintenance costs and annualized capital costs and other variables like average number of sessions per station per month, average electricity use per charging session and average charging session length.

BC Hydro relies on the data it collected from April 1, 2019 and March 31, 2020 to estimate the average electricity consumption per charging session (13.1 kWh) and average charging session length (28.6 min). Regarding the average number of charging sessions per station per month, BC Hydro states that this variable is unknown and BC Hydro does not yet have enough information to estimate the station utilization after a rate is in place because the fast charging service is currently offered at no charge.

1.13.1 Please clarify why the data on average electricity consumption per charging session and average length of charging session is more reliable than the average number of sessions per station per month. Could switching from a free service to a paying service have affected these three variables to some degree? Please discuss.

RESPONSE:

The average electricity consumption per charging is expected to fairly stable as it is a function of the characteristic of the electric vehicle. These characteristics are fairly stable, changing with advancement in electric vehicle technology and the rate of turnover of electric vehicles in the market.

The average length of charging session depends on both the characteristics of the electric vehicle and customer behavior. Customer behaviour may change over

[1] B.C. tops North America for uptake in electric vehicle sales in 2020 | Vancouver Sun [published on April 7, 2021; retrieved on April 16, 2021]

time, i.e., it is possible that the average session length will go down if additional electric vehicle charging services become more widely available to Customers. However, BC Hydro expect this effect, if it occurs, will be over the longer term, and we do not view it as introducing significant uncertainty at this time.

As shown in section 3 of the Application, BC Hydro has strong evidence in the form of surveys and interviews to indicate that the average number of sessions per station per month will be impacted by the introduction of the Proposed Rate, however we do not know by how much this impact will be. Therefore, utilization is considered uncertain at this time.

13.0 C. RATE DESIGN

Reference: RATE DESIGN
Exhibit B-1, Section 4.2, pp. 28–30; Vancouver Sun article dated March 31, 2021: "B.C. tops North America for electric vehicle uptake in 2020, says minister"[1]
Assumptions used in cost recovery calculations

BC Hydro separates the cost of service into three components: electricity costs, station maintenance costs, and station capital costs.

BC Hydro estimates those costs using three equations that rely on known variables, like peak demand, demand charge, energy charge, annual maintenance costs and annualized capital costs and other variables like average number of sessions per station per month, average electricity use per charging session and average charging session length.

BC Hydro relies on the data it collected from April 1, 2019 and March 31, 2020 to estimate the average electricity consumption per charging session (13.1 kWh) and average charging session length (28.6 min). Regarding the average number of charging sessions per station per month, BC Hydro states that this variable is unknown and BC Hydro does not yet have enough information to estimate the station utilization after a rate is in place because the fast charging service is currently offered at no charge.

1.13.2 Has BC Hydro modeled what would be the stations' utilization rate at different price levels and, if so, please provide the model and its results.

RESPONSE:

BC Hydro has not modelled station utilization rates at different price levels and does not have the data to do so.

[1] B.C. tops North America for uptake in electric vehicle sales in 2020 | Vancouver Sun [published on April 7, 2021; retrieved on April 16, 2021]

13.0 C. RATE DESIGN

Reference: RATE DESIGN
Exhibit B-1, Section 4.2, pp. 28–30; Vancouver Sun article dated March 31, 2021: "B.C. tops North America for electric vehicle uptake in 2020, says minister"[1]
Assumptions used in cost recovery calculations

In the Vancouver Sun article, it is stated:

> Sales of zero-emission cars accounted for almost 10 per cent of all car sales in B.C. in 2020 — the highest electric vehicle uptake in North America — according to Bruce Ralston, the Minister of Energy, Mines and Low Carbon Innovation. […] In 2018, electric vehicle car sales made up just over four per cent of all car sales in B.C. In 2020, that figure was 9.2 per cent. "With the highest reported uptake rates of EVs in North America, B.C. is quickly becoming a leader in the EV industry," Ralston said.

On page 31 of the Application, BC Hydro presents Table 3 which shows the costs that the 50 kW station's proposed rate will recover under different utilization and cost recovery scenarios.

1.13.3 Please discuss how the rapid growth in EV adoption in BC and the emergence of makes and models with longer range and larger batteries in the last two years may have affected utilization rates, average electricity usage per session and average length of charging session, potentially rendering the data collected in 2019/2020 to be outdated.

RESPONSE:

BC Hydro expects that the impact on station utilization due to moving from a free service to one with a rate will be greater than the impact of changes to the other factors listed in the information request

The other factors described in the information request will change more gradually over time, as electric vehicle technology advances, electric vehicles adoption increases, and the additional electric vehicle charging options become available.

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[1] B.C. tops North America for uptake in electric vehicle sales in 2020 | Vancouver Sun [published on April 7, 2021; retrieved on April 16, 2021]

Generally, BC Hydro expects that station utilization will be impacted by various factors, including:

- **Overall number of electric vehicles compared to the number of fast charging stations;**
- **Evolving driver behaviour;**
- **Battery size and charge rate capability of these batteries;**
- **Increasing model availability (e.g., SUVs and pickup trucks);**
- **Convenience of charging sites (proximity to travel corridors and amenities, number of charging stations);**
- **Local competition and the convenience/quality of those sites; and**
- **General location of site (i.e., urban or rural).**

13.0 C. RATE DESIGN

Reference: RATE DESIGN
Exhibit B-1, Section 4.2, pp. 28–30; Vancouver Sun article dated March 31, 2021: "B.C. tops North America for electric vehicle uptake in 2020, says minister"[1]
Assumptions used in cost recovery calculations

In the Vancouver Sun article, it is stated:

> Sales of zero-emission cars accounted for almost 10 per cent of all car sales in B.C. in 2020 — the highest electric vehicle uptake in North America — according to Bruce Ralston, the Minister of Energy, Mines and Low Carbon Innovation. […] In 2018, electric vehicle car sales made up just over four per cent of all car sales in B.C. In 2020, that figure was 9.2 per cent. "With the highest reported uptake rates of EVs in North America, B.C. is quickly becoming a leader in the EV industry," Ralston said.

On page 31 of the Application, BC Hydro presents Table 3 which shows the costs that the 50 kW station's proposed rate will recover under different utilization and cost recovery scenarios.

1.13.4 Since the cost recovery calculations are highly dependant on BC Hydro's assumptions regarding average electricity consumption per charging session and average charging session length, please provide the following tables, in a format like Table 3:

- Holding the utilization rate at 15% and assuming a higher average electricity usage per session and a longer average session length;
- Holding the utilization rate at 15% and assuming a lower average electricity usage per session and a shorter average session length;
- Holding the utilization rate at 7.5% and assuming a higher average electricity usage per session and a longer average session length;
- Holding the utilization rate at 7.5% and assuming a lower average electricity usage per session and a shorter average session length;

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[1] B.C. tops North America for uptake in electric vehicle sales in 2020 | Vancouver Sun [published on April 7, 2021; retrieved on April 16, 2021]

- Holding the utilization rate at 5% and assuming a higher average electricity usage per session and a longer average session length; and
- Holding the utilization rate at 5% and assuming a lower average electricity usage per session and a shorter average session length.

RESPONSE:

The tables below show the cost that a 50 kW station's rate will recover under different utilization and cost recovery scenarios which include average electricity usage and average session length per session increased and decreased by 25 per cent at three utilization rate scenarios of 15 per cent, 7.5 per cent and 5 per cent. BC Hydro notes that utilization has the biggest impact on the rates as the rate goes down as utilization increases and fixed costs such as the station capital costs, and the Demand Charge are spread across more station users.

Utilization Rate		Proportional Increase or Decrease Factor		Scenario 1	Scenario 2	Scenario 3
(%)	Average Number of Charging Sessions per Station per month	Average electricity usage per charging session (%)	Average session length per charging session (%)	Electricity Costs (RS 1500 Equivalent) ($/min)	Electricity + Station Maintenance Costs ($/min)	Full Cost of Service: Electricity + Maintenance + Capital Costs ($/min)
15.0	307	0	-25	0.10	0.20	0.31
15.0	230	-25	0	0.07	0.18	0.28
15.0	307	-25	-25	0.09	0.19	0.29
15.0	230	0	0	0.09	0.19	0.29
15.0	184	25	25	0.09	0.19	0.29
15.0	230	25	0	0.10	0.20	0.31
15.0	184	0	25	0.08	0.18	0.29

Utilization Rate		Proportional Increase or Decrease Factor		Scenario 1	Scenario 2	Scenario 3
(%)	Average Number of Charging Sessions per Station per month	Average electricity usage per charging session (%)	Average electricity usage per charging session (%)	Electricity Costs (RS 1500 Equivalent) ($/min)	Electricity + Station Maintenance Costs ($/min)	Full Cost of Service: Electricity + Maintenance + Capital Costs ($/min)
7.5	115	0	-25	0.17	0.44	0.73
7.5	153	-25	0	0.09	0.25	0.41
7.5	153	-25	-25	0.13	0.33	0.54
7.5	115	0	0	0.13	0.33	0.54
7.5	92	25	25	0.13	0.33	0.54
7.5	92	25	0	0.16	0.41	0.68
7.5	115	0	25	0.10	0.26	0.44

Utilization Rate		Proportional Increase or Decrease Factor		Scenario 1	Scenario 2	Scenario 3
(%)	Average Number of Charging Sessions per Station per month	Average electricity usage per charging session (%)	Average electricity usage per charging session (%)	Electricity Costs (RS 1500 Equivalent) ($/min)	Electricity + Station Maintenance Costs ($/min)	Full Cost of Service: Electricity + Maintenance + Capital Costs ($/min)
5.0	77	0	-25	0.22	0.63	1.06
5.0	102	-25	0	0.13	0.35	0.60
5.0	102	-25	-25	0.17	0.47	0.79
5.0	77	0	0	0.17	0.47	0.79
5.0	61	25	25	0.17	0.47	0.79
5.0	61	25	0	0.21	0.59	0.99
5.0	77	0	25	0.13	0.38	0.64

14.0 C. RATE DESIGN

Reference: RATE DESIGN
Exhibit B-1, Section 4.1, p. 27, Section 4.2, Table 3, pp. 31–32
Cost recovery calculations

On page 31, BC Hydro presents the costs that the 50 kW station's proposed rate will recover under different utilization and cost recovery scenarios in the following table:

Table 3 50 kW Charging Station Rate by Utilization and Cost Recovery Scenario

Utilization Rate		Scenario 1	Scenario 2	Scenario 3
(%)	Average Number of Charging Sessions per Station per Month	Electricity Costs (RS 1500 Equivalent) ($/min)	Electricity + Station Maintenance Costs[17] ($/min)	Full Cost of Service: Electricity + Maintenance + Capital Costs ($/min)
3	46	0.25	0.76	1.29
3.7	57	0.21	0.62	1.06
5	77	0.17	0.47	0.79
10	153	0.11	0.26	0.42
15	230	0.09	0.19	0.29
20	307	0.07	0.15	0.23

On page 27, BC Hydro states:

> Other fast charging operators (i.e., exempt utilities) in BC Hydro's service territory take General Service and are charged under the applicable General Service Rate Schedule based on their electricity Demand. Adopting General Service rates as the basis for the Proposed Rates in the Application ensures that BC Hydro's rate for fast charging service is not lower than the Energy and Demand rates BC Hydro charges to other fast charging station operators. [Emphasis added]

On pages 31 to 32, BC Hydro notes that its "Proposed Rate of 21 cents per minute would recover electricity (Energy and Demand) costs as specified under the MGS rate schedule at a utilization rate of 3.7 per cent."

1.14.1 Please provide a similar analysis for the 25 kW station by updating Table 3 accordingly, using the data BC Hydro collected on the use of these 25 kW stations. If BC Hydro does not have enough actual data, please use the same assumptions for average electricity

usage per session and average length of charging session than it used for the 50 kW station.

RESPONSE:

Below is an analysis similar to Table 3 for the 25 kW station using the same assumption for average electricity usage per session and average length of charging session used for the 50 kW station on page 29 of the Application:

Utilization Rate		Scenario 1	Scenario 2	Scenario 3
(%)	Average Number of Charging Sessions per Station per Month	Electricity Costs (RS 1300 Equivalent with Demand Charge Recovery) ($/min)	Electricity + Station Maintenance Costs ($/min)	Full Cost of Service: Electricity + Maintenance + Capital Costs ($/min)
3.0	46	0.14	0.65	1.44
3.7	57	0.12	0.53	1.17
5.0	77	0.10	0.40	0.88
5.5	84	0.09	0.37	0.80
10.0	153	0.06	0.21	0.45
15.0	230	0.06	0.16	0.32
20.0	307	0.06	0.13	0.25

As discussed in BC Hydro's response to BCUC IR 1.7.2, as the Proposed Rate for 25 kW station is based on Small General Service (SGS) and does not contain a demand charge component, this may result in under recovery of demand related costs if the Propose Rate is based on the SGS rate alone. BC Hydro has therefore set the rate at 12 cents per minute, about 60 per cent of the Proposed Rate for 50 kW.

14.0 C. RATE DESIGN

Reference: RATE DESIGN
Exhibit B-1, Section 4.1, p. 27, Section 4.2, Table 3, pp. 31–32
Cost recovery calculations

On page 31, BC Hydro presents the costs that the 50 kW station's proposed rate will recover under different utilization and cost recovery scenarios in the following table:

Table 3 50 kW Charging Station Rate by Utilization and Cost Recovery Scenario

Utilization Rate		Scenario 1	Scenario 2	Scenario 3
(%)	Average Number of Charging Sessions per Station per Month	Electricity Costs (RS 1500 Equivalent) ($/min)	Electricity + Station Maintenance Costs[17] ($/min)	Full Cost of Service: Electricity + Maintenance + Capital Costs ($/min)
3	46	0.25	0.76	1.29
3.7	57	0.21	0.62	1.06
5	77	0.17	0.47	0.79
10	153	0.11	0.26	0.42
15	230	0.09	0.19	0.29
20	307	0.07	0.15	0.23

On page 27, BC Hydro states:

> Other fast charging operators (i.e., exempt utilities) in BC Hydro's service territory take General Service and are charged under the applicable General Service Rate Schedule based on their electricity Demand. Adopting General Service rates as the basis for the Proposed Rates in the Application ensures that BC Hydro's rate for fast charging service is not lower than the Energy and Demand rates BC Hydro charges to other fast charging station operators. [Emphasis added]

On pages 31 to 32, BC Hydro notes that its "Proposed Rate of 21 cents per minute would recover electricity (Energy and Demand) costs as specified under the MGS rate schedule at a utilization rate of 3.7 per cent."

1.14.2 Please provide a similar analysis for the 100 kW station by updating Table 3 accordingly, using the same assumptions for average electricity usage per session and average length of charging session than it used for the 50 kW station.

RESPONSE:

When responding to BCUC IR 1.7.2, BC Hydro noticed an error in page 32 of the Application. This page should have indicated that the utilization of 100 kW station is 5.5 per cent. This is corrected in Errata No. 1 to the Application. This error does not change the rate calculation.

Below is an analysis similar to Table 3 for the 100 kW station using the same assumption for average electricity usage per session and average length charging session used for the 50 kW station on page 29 of the Application:

Utilization Rate		Scenario 1	Scenario 2	Scenario 3
(%)	Average Number of Charging Sessions per Station per Month	Electricity Costs (RS 1500 Equivalent) ($/min)	Electricity + Station Maintenance Costs ($/min)	Full Cost of Service: Electricity + Maintenance + Capital Costs ($/min)
3.0	46	0.45	0.96	1.69
3.7	57	0.38	0.79	1.38
5.0	77	0.29	0.59	1.03
5.5	84	0.27	0.54	0.94
10.0	153	0.17	0.32	0.54
15.0	230	0.13	0.23	0.37
20.0	307	0.11	0.18	0.29

14.0 C. RATE DESIGN

Reference: RATE DESIGN
Exhibit B-1, Section 4.1, p. 27, Section 4.2, Table 3, pp. 31–32
Cost recovery calculations

On page 31, BC Hydro presents the costs that the 50 kW station's proposed rate will recover under different utilization and cost recovery scenarios in the following table:

Table 3 50 kW Charging Station Rate by Utilization and Cost Recovery Scenario

Utilization Rate		Scenario 1	Scenario 2	Scenario 3
(%)	Average Number of Charging Sessions per Station per Month	Electricity Costs (RS 1500 Equivalent) ($/min)	Electricity + Station Maintenance Costs[17] ($/min)	Full Cost of Service: Electricity + Maintenance + Capital Costs ($/min)
3	46	0.25	0.76	1.29
3.7	57	0.21	0.62	1.06
5	77	0.17	0.47	0.79
10	153	0.11	0.26	0.42
15	230	0.09	0.19	0.29
20	307	0.07	0.15	0.23

On page 27, BC Hydro states:

> Other fast charging operators (i.e., exempt utilities) in BC Hydro's service territory take General Service and are charged under the applicable General Service Rate Schedule based on their electricity Demand. Adopting General Service rates as the basis for the Proposed Rates in the Application ensures that BC Hydro's rate for fast charging service is not lower than the Energy and Demand rates BC Hydro charges to other fast charging station operators. [Emphasis added]

On pages 31 to 32, BC Hydro notes that its "Proposed Rate of 21 cents per minute would recover electricity (Energy and Demand) costs as specified under the MGS rate schedule at a utilization rate of 3.7 per cent."

1.14.3 Please confirm, or otherwise explain, that if the utilization rate were to remain at 15 percent, the full cost of service (COS) would be $0.29/min and other BC Hydro ratepayers would

cross-subsidized the EV fast charging service at the level of $0.08/min under the proposed rate of $0.21/min.

RESPONSE:

Confirmed.

14.0 C. RATE DESIGN

Reference: RATE DESIGN
Exhibit B-1, Section 4.1, p. 27, Section 4.2, Table 3, pp. 31–32
Cost recovery calculations

On page 31, BC Hydro presents the costs that the 50 kW station's proposed rate will recover under different utilization and cost recovery scenarios in the following table:

Table 3 50 kW Charging Station Rate by Utilization and Cost Recovery Scenario

Utilization Rate		Scenario 1	Scenario 2	Scenario 3
(%)	Average Number of Charging Sessions per Station per Month	Electricity Costs (RS 1500 Equivalent) ($/min)	Electricity + Station Maintenance Costs[17] ($/min)	Full Cost of Service: Electricity + Maintenance + Capital Costs ($/min)
3	46	0.25	0.76	1.29
3.7	57	0.21	0.62	1.06
5	77	0.17	0.47	0.79
10	153	0.11	0.26	0.42
15	230	0.09	0.19	0.29
20	307	0.07	0.15	0.23

On page 27, BC Hydro states:

> Other fast charging operators (i.e., exempt utilities) in BC Hydro's service territory take General Service and are charged under the applicable General Service Rate Schedule based on their electricity Demand. Adopting General Service rates as the basis for the Proposed Rates in the Application ensures that BC Hydro's rate for fast charging service is not lower than the Energy and Demand rates BC Hydro charges to other fast charging station operators. [Emphasis added]

On pages 31 to 32, BC Hydro notes that its "Proposed Rate of 21 cents per minute would recover electricity (Energy and Demand) costs as specified under the MGS rate schedule at a utilization rate of 3.7 per cent."

1.14.4 Please confirm, or otherwise explain, that if the utilization rate were at the lower end of BC Hydro's expected range of utilization rate, i.e., 3 percent, the full COS would be $1.29/min and other BC Hydro ratepayers would cross-subsidize the EV fast charging

service at the level of $1.08/min under the proposed rate of $0.21/min.

RESPONSE:

Confirmed. Cross-subsidization refers to the revenue difference between the amount collected under the Proposed Rates and the remaining amount to be collected from all ratepayers as allowed under section 18 of the *Clean Energy Act*).

14.0 C. RATE DESIGN

Reference: RATE DESIGN
Exhibit B-1, Section 4.1, p. 27, Section 4.2, Table 3, pp. 31–32
Cost recovery calculations

On page 31, BC Hydro presents the costs that the 50 kW station's proposed rate will recover under different utilization and cost recovery scenarios in the following table:

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10	153	0.11	0.26	0.42
15	230	0.09	0.19	0.29
20	307	0.07	0.15	0.23

On page 27, BC Hydro states:

> Other fast charging operators (i.e., exempt utilities) in BC Hydro's service territory take General Service and are charged under the applicable General Service Rate Schedule based on their electricity Demand. Adopting General Service rates as the basis for the Proposed Rates in the Application ensures that BC Hydro's rate for fast charging service is not lower than the Energy and Demand rates BC Hydro charges to other fast charging station operators. [Emphasis added]

On pages 31 to 32, BC Hydro notes that its "Proposed Rate of 21 cents per minute would recover electricity (Energy and Demand) costs as specified under the MGS rate schedule at a utilization rate of 3.7 per cent."

1.14.5 Please confirm, or otherwise explain, that the actual level of cross-subsidization from other BC Hydro ratepayers is highly dependant on the utilization rate of the stations, the average electricity usage per session and the average length of a charging

session and will only be known with more certainty as BC Hydro collects data on these variables once the Proposed Rates take effect on May 1, 2021.

RESPONSE:

BC Hydro confirms that the level of cross-subsidization (that is, the revenue difference between the amount collected under the Proposed Rates and the remaining amount to be collected from all ratepayers as allowed under section 18 of the *Clean Energy Act*) will depend on the utilization rate of the stations, the average electricity usage per session and the average length of a charging session.

For clarity, we note the timeline on which we expect to be able to assess these factors, considering data availability, is described in section 5 of the Application, where we described our planned evaluation to be filed by March 2024.

14.0 C. RATE DESIGN

Reference: RATE DESIGN
Exhibit B-1, Section 4.1, p. 27, Section 4.2, Table 3, pp. 31–32
Cost recovery calculations

On page 31, BC Hydro presents the costs that the 50 kW station's proposed rate will recover under different utilization and cost recovery scenarios in the following table:

Table 3 50 kW Charging Station Rate by Utilization and Cost Recovery Scenario

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10	153	0.11	0.26	0.42
15	230	0.09	0.19	0.29
20	307	0.07	0.15	0.23

On page 27, BC Hydro states:

> Other fast charging operators (i.e., exempt utilities) in BC Hydro's service territory take General Service and are charged under the applicable General Service Rate Schedule based on their electricity Demand. Adopting General Service rates as the basis for the Proposed Rates in the Application ensures that BC Hydro's rate for fast charging service is not lower than the Energy and Demand rates BC Hydro charges to other fast charging station operators. [Emphasis added]

On pages 31 to 32, BC Hydro notes that its "Proposed Rate of 21 cents per minute would recover electricity (Energy and Demand) costs as specified under the MGS rate schedule at a utilization rate of 3.7 per cent."

1.14.6 Please confirm, or otherwise explain, that if the utilization rate were at the lower end of BC Hydro's expected range of utilization rate, i.e., 3 percent, BC Hydro's proposed rate of $0.21/min would not fully recover the cost of electricity at $0.25/min.

RESPONSE:

Confirmed.

14.0 C. RATE DESIGN

Reference: RATE DESIGN
Exhibit B-1, Section 4.1, p. 27, Section 4.2, Table 3, pp. 31–32
Cost recovery calculations

On page 31, BC Hydro presents the costs that the 50 kW station's proposed rate will recover under different utilization and cost recovery scenarios in the following table:

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10	153	0.11	0.26	0.42
15	230	0.09	0.19	0.29
20	307	0.07	0.15	0.23

On page 27, BC Hydro states:

> Other fast charging operators (i.e., exempt utilities) in BC Hydro's service territory take General Service and are charged under the applicable General Service Rate Schedule based on their electricity Demand. Adopting General Service rates as the basis for the Proposed Rates in the Application ensures that BC Hydro's rate for fast charging service is not lower than the Energy and Demand rates BC Hydro charges to other fast charging station operators. [Emphasis added]

On pages 31 to 32, BC Hydro notes that its "Proposed Rate of 21 cents per minute would recover electricity (Energy and Demand) costs as specified under the MGS rate schedule at a utilization rate of 3.7 per cent."

1.14.6 Please confirm, or otherwise explain, that if the utilization rate were at the lower end of BC Hydro's expected range of utilization rate, i.e., 3 percent, BC Hydro's proposed rate of $0.21/min would not fully recover the cost of electricity at $0.25/min.

1.14.6.1 If confirmed, please reconcile with BC Hydro's statement that adopting the General Service rates as a basis for the Proposed Rates ensures that BC Hydro's rate for fast charging service is not lower than the Energy and Demand rates BC Hydro charges to other operators.

RESPONSE:

Please refer to BC Hydro's response to BCUC IR 1.14.6 where we confirm that at very low utilization levels, a rate of $0.21/minute may not fully recover the cost of electricity.

BC Hydro's longer-term rate design objective is for the fast charging service rates to collect sufficient revenues from the customers taking this service to recover its full costs. Over the near term, our rates are intended to collect sufficient revenue to recover at least the cost of electricity based on BC Hydro's General Service Rate Schedules.

BC Hydro's success in achieving these objectives will largely depend on station utilization. If the station utilization is too low, neither objective will be achieved. As this is a new service for BC Hydro, we do not know what the station utilization will be once the Proposed Rates or other approved rates are introduced.

BC Hydro's view is that our Proposed Rates are reasonable based on the information available at this time, and that our proposed monitoring and evaluation plan presented in section 5 of the Application provides a reasonable process for collecting the required information to refine our pricing structure towards increased cost recovery from the customers of electric vehicle fast charging service.

14.0 C. RATE DESIGN

Reference: RATE DESIGN
Exhibit B-1, Section 4.1, p. 27, Section 4.2, Table 3, pp. 31–32
Cost recovery calculations

On page 31, BC Hydro presents the costs that the 50 kW station's proposed rate will recover under different utilization and cost recovery scenarios in the following table:

Table 3 50 kW Charging Station Rate by Utilization and Cost Recovery Scenario

Utilization Rate		Scenario 1	Scenario 2	Scenario 3
(%)	Average Number of Charging Sessions per Station per Month	Electricity Costs (RS 1500 Equivalent) ($/min)	Electricity + Station Maintenance Costs[17] ($/min)	Full Cost of Service: Electricity + Maintenance + Capital Costs ($/min)
3	46	0.25	0.76	1.29
3.7	57	0.21	0.62	1.06
5	77	0.17	0.47	0.79
10	153	0.11	0.26	0.42
15	230	0.09	0.19	0.29
20	307	0.07	0.15	0.23

On page 27, BC Hydro states:

> Other fast charging operators (i.e., exempt utilities) in BC Hydro's service territory take General Service and are charged under the applicable General Service Rate Schedule based on their electricity Demand. Adopting General Service rates as the basis for the Proposed Rates in the Application ensures that BC Hydro's rate for fast charging service is not lower than the Energy and Demand rates BC Hydro charges to other fast charging station operators. [Emphasis added]

On pages 31 to 32, BC Hydro notes that its "Proposed Rate of 21 cents per minute would recover electricity (Energy and Demand) costs as specified under the MGS rate schedule at a utilization rate of 3.7 per cent."

1.14.7 Please discuss whether BC Hydro should charge a minimum rate of $0.25/min to ensure full recovery of the electricity costs if the utilization rate were to be at the lower end of BC Hydro's expected range of utilization rate.

RESPONSE:

BC Hydro does not expect that a minimum rate of $0.25/min would ensure full recovery of the electricity costs. As described on page 15 of the Application, about half (49 per cent) of customers surveyed indicate they will stop using BC Hydro's fast charging service once a rate is introduced. This indicates such customers are price sensitive. Increased rates may therefore reduce station utilization, which would correspondingly reduce revenue and increase revenue collection (in rates) from all ratepayers as required under section 18 of the *Clean Energy Act*.

BC Hydro's Proposed Rates are intended to encourage station utilization while maintaining a level playing field with other fast charging station operators by considering prices of other operators and the range of prices that research indicates customers are willing to pay, and collecting sufficient revenue to recover at least the cost of electricity.

14.0 C. RATE DESIGN

Reference: RATE DESIGN
Exhibit B-1, Section 4.1, p. 27, Section 4.2, Table 3, pp. 31–32
Cost recovery calculations

On page 31, BC Hydro presents the costs that the 50 kW station's proposed rate will recover under different utilization and cost recovery scenarios in the following table:

Table 3 50 kW Charging Station Rate by Utilization and Cost Recovery Scenario

Utilization Rate		Scenario 1	Scenario 2	Scenario 3
(%)	Average Number of Charging Sessions per Station per Month	Electricity Costs (RS 1500 Equivalent) ($/min)	Electricity + Station Maintenance Costs[17] ($/min)	Full Cost of Service: Electricity + Maintenance + Capital Costs ($/min)
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On pages 31 to 32, BC Hydro notes that its "Proposed Rate of 21 cents per minute would recover electricity (Energy and Demand) costs as specified under the MGS rate schedule at a utilization rate of 3.7 per cent."

1.14.8 Please confirm, or otherwise explain, that if exempt providers (who buy their electricity from BC Hydro) had utilization rates of 3 percent, and the assumptions for average electricity usage per charging session and average length of charging session were

identical to BC Hydro's,[1] the electricity component of the costs borne by these networks would also be $0.25/min.

RESPONSE:

The cost of electricity for BC Hydro customers, including customers who offer fast charging service, will depend on the applicable rate schedules under which they take service from BC Hydro and how they use electricity.

In a hypothetical scenario where the customer was served under the Medium General Service Rate, and their account covered only a 50 kW fast charging station with no other end uses such as lighting or a retail outlet, and the characteristics of electric vehicle charging load matched the description provided on page 28 and 29 of the Application, then the calculations shown in Table 3 for "Utilization Rate" and "Scenario 1 Electricity Costs" would apply. In this instance, a rate of $0.25 per minute should recover electricity costs if utilization is 3 per cent.

[1] Average electricity usage per charging session at 13.1 kWh and average length of charging session at 28.6 minutes.

14.0 C. RATE DESIGN

Reference: RATE DESIGN
Exhibit B-1, Section 4.1, p. 27, Section 4.2, Table 3, pp. 31–32
Cost recovery calculations

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Utilization Rate		Scenario 1	Scenario 2	Scenario 3
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1.14.8 Please confirm, or otherwise explain, that if exempt providers (who buy their electricity from BC Hydro) had utilization rates of 3 percent, and the assumptions for average electricity usage per charging session and average length of charging session were

identical to BC Hydro's,[1] the electricity component of the costs borne by these networks would also be $0.25/min.

1.14.8.1 Hypothetically, if these networks charged $0.27/min, does that mean they have $0.02/min to contribute towards maintenance and capital costs? Why or why not.

RESPONSE:

BC Hydro does not have insight to how other providers of fast charging service may fund maintenance and capital costs. We reasonably expect that a variety of business models exist for how maintenance and capital costs are funded.

[1] Average electricity usage per charging session at 13.1 kWh and average length of charging session at 28.6 minutes.

14.0 C. RATE DESIGN

Reference: RATE DESIGN
Exhibit B-1, Section 4.1, p. 27, Section 4.2, Table 3, pp. 31–32
Cost recovery calculations

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identical to BC Hydro's,[1] the electricity component of the costs borne by these networks would also be $0.25/min.

1.14.8.2 Based on the General Service rate that BC Hydro charges to exempt providers, can one expect their cost of electricity to reflect the third column of Table 3 under the same assumptions of utilization rate, average electricity usage per charging session and average length of charging session?

RESPONSE:

Please refer to BC Hydro's response to BCUC IR 1.14.8.

[1] Average electricity usage per charging session at 13.1 kWh and average length of charging session at 28.6 minutes.

14.0 C. RATE DESIGN

Reference: RATE DESIGN
Exhibit B-1, Section 4.1, p. 27, Section 4.2, Table 3, pp. 31–32
Cost recovery calculations

In the Vancouver Sun article, it states:

> Sales of zero-emission cars accounted for almost 10 per cent of all car sales in B.C. in 2020 — the highest electric vehicle uptake in North America — according to Bruce Ralston, the Minister of Energy, Mines and Low Carbon Innovation. […] In 2018, electric vehicle car sales made up just over four per cent of all car sales in B.C. In 2020, that figure was 9.2 per cent. "With the highest reported uptake rates of EVs in North America, B.C. is quickly becoming a leader in the EV industry," Ralston said.

1.14.9 Given that BC has the highest reported uptake rates of EVs in North America, please discuss why BC Hydro is proposing EV charging rates to recover less than its full cost of service, when taking into account the electricity, maintenance and capital costs. Please discuss why any cross subsidization from other BC Hydro ratepayers is necessary.

RESPONSE:

At shown in Table 3 of the Application, full cost recovery from fast charging service Customers would require either a rate of over $1.00 per minute at low utilization levels, or a rate similar to the Proposed Rates with utilization of 20 per cent.

A rate of over $1.00 per minute would be far greater than any other fast charging service provider (please refer to Table 2 of the Application). We reasonably expect that such a rate would result in Customers avoiding using BC Hydro's fast charging service, which would reduce revenue from the fast charging service and increase cross subsidization from other ratepayers.

A utilization of 20 per cent is a longer-term objective, but BC Hydro has no evidence to indicate that such utilization levels will be achieved over the near term. As described on page 32 of the Application, when the service was free, the average utilization was 15 per cent; however, potential station users indicated that they may stop using the service if a rate is introduced which shows they are price sensitive.

15.0 C. RATE DESIGN

Reference: RATE DESIGN
Exhibit B-1, Section 1.1, pp. 2–3, Section 1.3.3, p. 7, Section 4.1, p. 25; BCUC An Inquiry into the Regulation of Electric Vehicle Charging Service, Phase Two Report (Phase 2 EV Inquiry), p. i; FortisBC Inc. (FBC) Application for Approval of Rate Design and Rates for Electric Vehicle Direct Current Fast Charging Service (FBC Application)1, p. 12; Exhibit B-16, response to BCUC IR 2 20.6
Level playing field and cross-subsidization

In the Phase 2 EV Inquiry, one of the BCUC's findings states that:

> It is in the public interest to ensure that the playing field remains as level as possible. There is an opportunity for thoughtful regulation to ensure that non-exempt public utility investments do not crowd out exempt utility investments.

On pages 2 to 3, BC Hydro states:

> Under section 18 of the *Clean Energy Act*, BC Hydro is allowed "to collect sufficient revenue in each fiscal year to enable it to recover its costs incurred with respect to the prescribed undertaking.

On page 7, BC Hydro states:

> Section 18 does not specify from whom the revenue should be collected. For fast charging stations that qualify as prescribed undertakings, BC Hydro can recover costs from all ratepayers and not just from those who use the service. The Proposed Rates, if approved, would allow BC Hydro to collect revenues directly from those who use the fast charging service, which will reduce costs that need to be recovered from all ratepayers.

On page 25, BC Hydro states:

> In addition, as suggested in the customer feedback, BC Hydro's Proposed Rates are higher than the rate to charge at home, but less than that of operators such as Tesla and Petro-Canada, and also less than the equivalent of a tank of gas. [Emphasis added]

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1 Available at BCUC website: https://www.bcuc.com/ApplicationView.aspx?ApplicationId=611

In the FBC Application, FBC proposes rates for FBC-owned EV DCFC charging stations at a rate of $0.26/minute for 50 kW stations and $0.54/minute at 100 kW stations.[2] On page 12 of the FBC Application, it states:

> The proposed rate is based on a cost of service analysis of the stations and assumes a reasonable level of use based on both FBC's experience with its existing stations, as well as the projected growth in sales of EVs in BC over the next 10 years.

In a CityNews article dated March 31, 2021,[3] John Stonier with the Vancouver Electric Vehicle Association is quoted stating:

> We're concerned that if the monopoly utility puts out a rate that's low enough and doesn't reflect proper capital costs, private companies and businesses won't be able to afford to put in charging stations when our population of electric cars doubles, triples quadruples in the years ahead. […] We want to make sure that the rates that are set will adequately encourage the building of that infrastructure in the future.

1.15.1 Please explain why BC Hydro's EV fast charging service costs should be recovered from all ratepayers and not just paid for by those who use the service.

RESPONSE:

Please refer to BC Hydro's response to BCUC IR 1.2.4, where BC Hydro explains that while section 18(2) of the *Clean Energy Act* does not specify from whom or by what means the revenues are collected and the costs are recovered with respect to the electric vehicle fast charging stations, it does require that the BCUC, when setting rates, must ensure that a public utility like BC Hydro is allowed to collect sufficient revenue in each fiscal year to enable it to recover its costs incurred with respect to the prescribed undertakings. As explained in the Application, over the near-term, revenue collected under the Proposed Rates will not recover all costs of service; thus, the remaining costs will be recovered from all ratepayers as allowed under section 18(2) of the *Clean Energy Act*.

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2 FBC Application, Exhibit B-16, response to BCUC IR2 20.6.

3 Electric car charging fees coming to B.C. in May - NEWS 1130 (citynews1130.com) [published on April 1, 2021; retrieved on April 16, 2021]

15.0 C. RATE DESIGN

Reference: RATE DESIGN
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> It is in the public interest to ensure that the playing field remains as level as possible. There is an opportunity for thoughtful regulation to ensure that non-exempt public utility investments do not crowd out exempt utility investments.

On pages 2 to 3, BC Hydro states:

> Under section 18 of the *Clean Energy Act*, BC Hydro is allowed "to collect sufficient revenue in each fiscal year to enable it to recover its costs incurred with respect to the prescribed undertaking.

On page 7, BC Hydro states:

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On page 25, BC Hydro states:

> In addition, as suggested in the customer feedback, BC Hydro's Proposed Rates are higher than the rate to charge at home, but less than that of operators such as Tesla and Petro-Canada, and also less than the equivalent of a tank of gas. [Emphasis added]

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1.15.1.1 Please confirm, or explain otherwise, that the Proposed Rates are designed to have all BC Hydro ratepayers subsidize customers who use BC Hydro's public EV charging services. Please discuss how the Proposed Rates are not unduly preferential and not unduly discriminatory pursuant to section 59 to 61 of the UCA.

RESPONSE:

The BCUC must set a rate for BC Hydro to provide the regulated fast charging service.

The Proposed Rates are not designed to have all ratepayers subsidize the customers of the electric vehicle fast charging service. As described on page 2 of the Application, the Proposed Rates are designed to minimize cost impact on non-electric vehicle fast charging customers (i.e., the contribution of non-electric vehicle fast charging service customers to the cost of the service).

Given that the Proposed Rates are for fast charging service stations that are "prescribed undertakings" under section 5 of the Greenhouse Reduction (Clean Energy) Regulation, and that by virtue of section 18(2) of the *Clean Energy Act* the

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2 FBC Application, Exhibit B-16, response to BCUC IR2 20.6.

3 Electric car charging fees coming to B.C. in May - NEWS 1130 (citynews1130.com) [published on April 1, 2021; retrieved on April 16, 2021]

BCUC must allow BC Hydro to recover the cost of service from non-electric vehicle fast charging service customers, the rate design objective - minimizing the cost impact on all ratepayers (or the contribution from non-electric vehicle fast charging service customers) - is why the Proposed Rates meet the statutory requirements of sections 59 to 61 of the *Utilities Commission Act*.

15.0 C. RATE DESIGN

Reference: RATE DESIGN
Exhibit B-1, Section 1.1, pp. 2–3, Section 1.3.3, p. 7, Section 4.1, p. 25; BCUC An Inquiry into the Regulation of Electric Vehicle Charging Service, Phase Two Report (Phase 2 EV Inquiry), p. i; FortisBC Inc. (FBC) Application for Approval of Rate Design and Rates for Electric Vehicle Direct Current Fast Charging Service (FBC Application)1, p. 12; Exhibit B-16, response to BCUC IR 2 20.6
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> Under section 18 of the *Clean Energy Act*, BC Hydro is allowed "to collect sufficient revenue in each fiscal year to enable it to recover its costs incurred with respect to the prescribed undertaking.

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1.15.1.2 Please confirm, or explain otherwise, that in light of section 18 of the *Clean Energy Act*, the reverse situation could occur where customers who use BC Hydro's public EV charging services could also cross subsize all BC Hydro ratepayers.

RESPONSE:

The hypothetical situation described in this information request could only arise if the BCUC sets the rates for electric vehicle fast charging service at a level that would result in revenues from customers of this service that exceeded the cost of the service. As explained in section 4 of the Application and shown in Table 3 of the Application, this outcome is highly implausible at the present time, given the expected low station utilization in the near-term and the potential further decrease of station utilization if the rates were set higher than electric vehicle fast charging station operators in BC Hydro's service territory. Section 18 of the *Clean Energy Act* and section 5 of the Greenhouse Reduction (Clean Energy) Regulation have no bearing on this hypothetical situation.

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2 FBC Application, Exhibit B-16, response to BCUC IR2 20.6.

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1.15.2 Please discuss how BC Hydro could play a part in levelling the playing field as much as possible considering that exempt providers of fast charging service in BC may not have access to another pool of customers/ratepayers to recover costs from if the EV fast charging rates are insufficient to recover the full costs of the fast charging service.

RESPONSE:

BC Hydro plays a part in levelling the playing field by proposing fast charging rates that are designed to recover at least the cost of electricity (energy and demand), and that fall within the range of other operators in our service territory.

BC Hydro notes that each fast charging operator has their own business model and approach to cost recovery. We are unable to confirm that exempt providers of fast charging service do not have access to a pool of customers from which to recover their costs.

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1.15.3 Considering BC Hydro is proposing rates that are lower than those of alternative networks, please discuss the risk that BC Hydro's investment drive out private investment over time.

RESPONSE:

As shown in Table 2 of the Application, BC Hydro's Proposed Rates fall within the range of other fast charging operators in our service territory and therefore there is limited risk that BC Hydro's investment drive out private investment over time.

BC Hydro's investment in fast charging service is expected to support electric vehicle adoption, which should help increase the size of the fast charging market overall. BC Hydro encourages investment by others in public electric vehicle fast charging services as such services reduce a barrier to electric vehicle adoption. Electric vehicle adoption, in turn, is expected to benefit all BC Hydro's ratepayers in the form of increased electricity sales and revenues.

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Exhibit B-1, Section 1.1, pp. 2–3, Section 1.3.3, p. 7, Section 4.1, p. 25; BCUC An Inquiry into the Regulation of Electric Vehicle Charging Service, Phase Two Report (Phase 2 EV Inquiry), p. i; FortisBC Inc. (FBC) Application for Approval of Rate Design and Rates for Electric Vehicle Direct Current Fast Charging Service (FBC Application)1, p. 12; Exhibit B-16, response to BCUC IR 2 20.6
Level playing field and cross-subsidization

In the Phase 2 EV Inquiry, one of the BCUC's findings states that:

> It is in the public interest to ensure that the playing field remains as level as possible. There is an opportunity for thoughtful regulation to ensure that non-exempt public utility investments do not crowd out exempt utility investments.

On pages 2 to 3, BC Hydro states:

> Under section 18 of the *Clean Energy Act*, BC Hydro is allowed "to collect sufficient revenue in each fiscal year to enable it to recover its costs incurred with respect to the prescribed undertaking.

On page 7, BC Hydro states:

> Section 18 does not specify from whom the revenue should be collected. For fast charging stations that qualify as prescribed undertakings, BC Hydro can recover costs from all ratepayers and not just from those who use the service. The Proposed Rates, if approved, would allow BC Hydro to collect revenues directly from those who use the fast charging service, which will reduce costs that need to be recovered from all ratepayers.

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In the FBC Application, FBC proposes rates for FBC-owned EV DCFC charging stations at a rate of $0.26/minute for 50 kW stations and $0.54/minute at 100 kW stations.[2] On page 12 of the FBC Application, it states:

> The proposed rate is based on a cost of service analysis of the stations and assumes a reasonable level of use based on both FBC's experience with its existing stations, as well as the projected growth in sales of EVs in BC over the next 10 years.

In a CityNews article dated March 31, 2021,[3] John Stonier with the Vancouver Electric Vehicle Association is quoted stating:

> We're concerned that if the monopoly utility puts out a rate that's low enough and doesn't reflect proper capital costs, private companies and businesses won't be able to afford to put in charging stations when our population of electric cars doubles, triples quadruples in the years ahead. […] We want to make sure that the rates that are set will adequately encourage the building of that infrastructure in the future.

1.15.4 As BC Hydro and FBC are both regulated by the BCUC, please explain why BC Hydro customers (i.e. partial cost of service) should be treated differently than FBC customers (i.e. full cost of service).

RESPONSE:

Each of BC Hydro's and FortisBC's applications should be assessed individually by the BCUC based on their own merits and the regulatory and legal framework that applies.

BC Hydro does not believe that a full cost recovery is feasible for BC Hydro at this time at the anticipated utilization level at BC Hydro's fast charging stations, and has therefore proposed rates in the Application to recover the electricity supply cost based on applicable general service rates and also at a level to not discourage station utilization. In the longer term, BC Hydro expects that utilization rates will increase, and the rates will recover more of the cost of fast charging service.

BC Hydro's Proposed Rates and our monitoring and evaluation plan described in section 5 of the Application are developed in recognition that there is

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2 FBC Application, Exhibit B-16, response to BCUC IR2 20.6.

3 Electric car charging fees coming to B.C. in May - NEWS 1130 (citynews1130.com) [published on April 1, 2021; retrieved on April 16, 2021]

considerable uncertainly at this time regarding station utilization and fast charging service revenues.

Station utilization is a critical input variable in the calculation of revenue and cost recovery; however, BC Hydro does not yet have enough information to estimate the station utilization after a rate is in place because the approved interim rate for the fast charging station service just commenced on May 1, 2021. BC Hydro therefore makes no assumptions at this time about future station utilization levels and future cost recovery.

In this application, we have proposed reasonable rates based on applicable general service rates, taking into consideration customer feedback and jurisdictional review, and with the intent to recover at least the electricity costs. We have proposed to monitor and evaluate utilization and report back in fiscal 2024. By that time, BC Hydro should have sufficient utilization data to develop a reliable forecast on which to base a revenue and cost recovery forecast.

BC Hydro notes that the FortisBC approach is set to recover costs on a levelized basis and that there are periods when their forecast station utilization is low and other ratepayers will bear some of the cost of the fast charging service.

15.0 C. RATE DESIGN

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1.15.4.1 If the BC Hydro is directed to implement public EV fast charging service rates that would reflect BC Hydro's full cost of service, what rates would BC Hydro propose?

RESPONSE:

BC Hydro does not believe that there is a public fast charging service rate that would recover BC Hydro's full cost of service at this time. As shown in Table 3 of the Application, full cost recovery would require either a rate of over $1.00 per minute at low station utilization levels, or a rate similar to the Proposed Rates but with utilization levels of 20 per cent.

BC Hydro reasonably expects customers would avoid using BC Hydro fast charging service at a rate of $1.00 per minute, which would reduce revenue and negatively impact cost recovery.

BC Hydro has no evidence at this time to suggest that utilization levels will reach 20 per cent once a rate is introduced. When the service was free, the average utilization level was 15 per cent. As shown in the survey in section 3.1 of the Application, the level of station utilization would decrease as potential station users indicated that they would stop using the service if a rate is introduced.

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1.15.4.2 Please discuss the parameters that would trigger BC Hydro to implement public EV fast charging service rates that would reflect BC Hydro's full cost of service.

RESPONSE:

There is no specific trigger that would allow BC Hydro to implement fast charging rates that reflect BC Hydro's full cost of service. The Proposed Rates as filed would recover the full cost of service if station utilization increases enough.

BC Hydro's longer-term rate design objective is for the fast charging service rates to collect sufficient revenues from the customers of the service to recover its full costs of service. Achieving this goal will require station utilization and revenues to grow.

As described in section 5 of the Application, we intend to monitor station utilization, revenues and costs and, if warranted, file an application to propose new rate(s) for fast charging service by March 31, 2024.

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2 FBC Application, Exhibit B-16, response to BCUC IR2 20.6.

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1.15.5 How much weight did BC Hydro place on customer feedback when selecting its proposed rates versus other factors like the BCUC Phase 2 EV Inquiry findings, appropriate level of cross-subsidization, revenue maximization, impact on utilization rate, etc.?

RESPONSE:

Please refer to BC Hydro's response to BCUC IR 1.8.2.

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16.0 C. RATE DESIGN

Reference: RATE DESIGN
Exhibit B-1, Section 3.1, p. 15, Section 4.2, pp. 31–32
Utilization rate assumptions

On page 32, BC Hydro states that "[w]hen the service was free, the average utilization was 15 per cent."

On page 15, BC Hydro states:

> *Support for a fee*: While almost two-thirds (59 per cent) indicate it is reasonable to charge a rate for the use of a public fast charging station, about half (49 per cent) indicate they would stop using the service if a rate is introduced. One-third (34 per cent) indicate public charging service is critical to them and they have nowhere else to charge.

On page 31, BC Hydro states that "based on a market study, we believe that the range of 3 to 5 per cent utilization is a reasonable estimate at this time for the 50 kW station."

The market study referenced in the above quote is from the Rocky Mountain Institute and is entitled "DCFC Rate Design Study" (RMI Study).[1]

At pages 12-13, the RMI Study states:

Utilization Rates

We define "utilization rate" as the total time a charger is actively charging divided by the duration being evaluated. In this report, we use a one-month time period to calculate station utilization. For example, in a month with 30 days, there are 720 hours. If a charger were in use for a total of 36 hours over the course of the month (on average, 72 minutes a day), the charger would have a 5% utilization rate (5% of 720 hours is 36 hours).

In the United States, most DCFC charging stations are on tariffs that are prohibitively expensive for DCFC network operators while utilization rates on the chargers are low. Since most of the country still has a relatively small number of EVs on the road, utilization rates on the chargers are generally low, where the tariffs impose

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very high demand-charge costs on the network operators because of the spiky, infrequent nature of the load of a public DCFC. We detailed this issue in depth in our March 2017 report, *EVgo Fleet and Tariff Analysis*. We believe that when utilization rates on DCFC charging stations increase to roughly 30%, the charging stations will be able to operate profitably under a typical utility tariff while at the same time offering pricing to EV drivers that is at parity with refueling using gasoline or diesel.[ii] But until the EV market matures considerably and the demand for public DCFC charging grows to increase the utilization rates of the chargers, most tariffs currently offered by utilities are untenable and are inhibiting the growth of public fast-charging networks.

Therefore, it is important to test any proposed tariff under multiple utilization rates to understand what kinds of costs it will impose on DCFC network operators today, in the early days of EV adoption, and what those costs might be in a growing and mature market. Accordingly, we modeled the public DCFC loads under the following utilization rates to represent a 10-year period of rapid growth in EV adoption:

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- A 10% utilization rate for the next three years to represent what a typical public DCFC load might be when the market begins to grow
- A 30% utilization rate for the next four years to represent what a typical public DCFC load might look like as the market matures

1.16.1 Considering that only about half of the survey respondents indicated that they would stop using the service if a rate was introduced, please explain why BC Hydro does not expect the utilization rate to be around 7.5%.

RESPONSE:

As this is BC Hydro's first rates for electric vehicle fast charging service, we have no actual data on how customers may respond to the newly introduced rates. While BC Hydro's expectation is that the station utilization will vary with to the rates to be set and the survey response is indicative of this, there are also various other factors aside from rates, such as electric vehicle sales, that affect station utilization as further discussed in BC Hydro's response to BCUC IR 1.16.5.

BC Hydro notes that if utilization is higher than expected, this will be a good outcome to the benefit of all ratepayers as described in section 1.3.2 of the Application.

16.0 C. RATE DESIGN

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Utilization rate assumptions

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- A 30% utilization rate for the next four years to represent what a typical public DCFC load might look like as the market matures

1.16.1.1 Please add a line to Table 3 corresponding to a utilization rate of 7.5%.

RESPONSE:

Below is a revised Table 3 for 50 kW station with an added row for a 7.5 per cent utilization rate:

Utilization Rate		Scenario 1	Scenario 2	Scenario 3
(%)	**Average Number of Charging Sessions per Station per Month**	**Electricity Costs (RS 1500 Equivalent) ($/min)**	**Electricity + Station Maintenance Costs ($/min)**	**Full Cost of Service: Electricity + Maintenance + Capital Costs ($/min)**
3.0	**46**	**0.25**	**0.76**	**1.29**
3.7	**57**	**0.21**	**0.62**	**1.06**
5.0	**77**	**0.17**	**0.47**	**0.79**
7.5	**115**	**0.13**	**0.33**	**0.54**
10.0	**153**	**0.11**	**0.26**	**0.42**
15.0	**230**	**0.09**	**0.19**	**0.29**
20.0	**307**	**0.07**	**0.15**	**0.23**

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1.16.2 Considering that about a third of the survey respondents indicated that they have nowhere else to charge, meaning that they would likely continue to use the service even if a rate was charged, please explain why BC Hydro does not expect the utilization rate to be at 5% at a minimum.

RESPONSE:

Please refer to BC Hydro's response to BCUC IR 1.16.1.

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1.16.3 Considering the minimum utilization rate analyzed in the RMI Study, please explain why BC Hydro believes that the range of 3 to 5 percent utilization is a reasonable estimate.

RESPONSE:

Please refer to BC Hydro's response to BCUC IR 1.16.1.

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The market study referenced in the above quote is from the Rocky Mountain Institute and is entitled "DCFC Rate Design Study" (RMI Study).[1]

At pages 12-13, the RMI Study states:

Utilization Rates

We define "utilization rate" as the total time a charger is actively charging divided by the duration being evaluated. In this report, we use a one-month time period to calculate station utilization. For example, in a month with 30 days, there are 720 hours. If a charger were in use for a total of 36 hours over the course of the month (on average, 72 minutes a day), the charger would have a 5% utilization rate (5% of 720 hours is 36 hours).

In the United States, most DCFC charging stations are on tariffs that are prohibitively expensive for DCFC network operators while utilization rates on the chargers are low. Since most of the country still has a relatively small number of EVs on the road, utilization rates on the chargers are generally low, where the tariffs impose

[1] Fitzgerald, G. & Nelder, C., DCFC Rate Design Study For The Colorado Energy Office (2019), retrieved from https://rmi.org/insight/dcfc-rate-design-study/

very high demand-charge costs on the network operators because of the spiky, infrequent nature of the load of a public DCFC. We detailed this issue in depth in our March 2017 report, *EVgo Fleet and Tariff Analysis*. We believe that when utilization rates on DCFC charging stations increase to roughly 30%, the charging stations will be able to operate profitably under a typical utility tariff while at the same time offering pricing to EV drivers that is at parity with refueling using gasoline or diesel.[ii] But until the EV market matures considerably and the demand for public DCFC charging grows to increase the utilization rates of the chargers, most tariffs currently offered by utilities are untenable and are inhibiting the growth of public fast-charging networks.

Therefore, it is important to test any proposed tariff under multiple utilization rates to understand what kinds of costs it will impose on DCFC network operators today, in the early days of EV adoption, and what those costs might be in a growing and mature market. Accordingly, we modeled the public DCFC loads under the following utilization rates to represent a 10-year period of rapid growth in EV adoption:

- A 5% utilization rate for the first three years to represent a typical public DCFC load in today's early EV market
- A 10% utilization rate for the next three years to represent what a typical public DCFC load might be when the market begins to grow
- A 30% utilization rate for the next four years to represent what a typical public DCFC load might look like as the market matures

1.16.4 Does BC Hydro have information on the driving habits of the survey respondents or the context in which they used the BC Hydro fast charging stations to help BC Hydro better assess the implications of the survey responses? For example, if drivers have been relying on BC Hydro's fast charging stations for road trips, they would likely continue to use the service even if a rate is introduced, but if they have been using the BC Hydro's stations in lieu of charging at home because it was free, they may now charge at home as this becomes the next least expensive option.

RESPONSE:

BC Hydro does not have the overall driving habits of the survey respondents provided in the Application. All the questions that were asked in the survey are provided in Appendix D of the Application.

BC Hydro expects that reduction in station utilization at a particular station resulting from the implementation of the rate will be lowest for those stations that are on driving corridors where there are no alternatives (e.g., Britton Creek). For the urban and suburban stations, it is expected that the implementation of the rate will have the greatest impact on station utilization.

16.0 C. RATE DESIGN

Reference: RATE DESIGN
Exhibit B-1, Section 3.1, p. 15, Section 4.2, pp. 31–32
Utilization rate assumptions

On page 32, BC Hydro states that "[w]hen the service was free, the average utilization was 15 per cent."

On page 15, BC Hydro states:

> *Support for a fee*: While almost two-thirds (59 per cent) indicate it is reasonable to charge a rate for the use of a public fast charging station, about half (49 per cent) indicate they would stop using the service if a rate is introduced. One-third (34 per cent) indicate public charging service is critical to them and they have nowhere else to charge.

On page 31, BC Hydro states that "based on a market study, we believe that the range of 3 to 5 per cent utilization is a reasonable estimate at this time for the 50 kW station."

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Utilization Rates

We define "utilization rate" as the total time a charger is actively charging divided by the duration being evaluated. In this report, we use a one-month time period to calculate station utilization. For example, in a month with 30 days, there are 720 hours. If a charger were in use for a total of 36 hours over the course of the month (on average, 72 minutes a day), the charger would have a 5% utilization rate (5% of 720 hours is 36 hours).

In the United States, most DCFC charging stations are on tariffs that are prohibitively expensive for DCFC network operators while utilization rates on the chargers are low. Since most of the country still has a relatively small number of EVs on the road, utilization rates on the chargers are generally low, where the tariffs impose

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very high demand-charge costs on the network operators because of the spiky, infrequent nature of the load of a public DCFC. We detailed this issue in depth in our March 2017 report, *EVgo Fleet and Tariff Analysis*. We believe that when utilization rates on DCFC charging stations increase to roughly 30%, the charging stations will be able to operate profitably under a typical utility tariff while at the same time offering pricing to EV drivers that is at parity with refueling using gasoline or diesel.[ii] But until the EV market matures considerably and the demand for public DCFC charging grows to increase the utilization rates of the chargers, most tariffs currently offered by utilities are untenable and are inhibiting the growth of public fast-charging networks.

Therefore, it is important to test any proposed tariff under multiple utilization rates to understand what kinds of costs it will impose on DCFC network operators today, in the early days of EV adoption, and what those costs might be in a growing and mature market. Accordingly, we modeled the public DCFC loads under the following utilization rates to represent a 10-year period of rapid growth in EV adoption:

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- A 30% utilization rate for the next four years to represent what a typical public DCFC load might look like as the market matures

1.16.5 Please discuss the factors, aside from rates, that could lead to a higher/lower utilization rate of the charging stations over the short-term (1-3 years) and mid-term (4-5 years) (e.g., strategic location of chargers, EV adoption growth rate, average range of EVs, DCFC rates, competition, government policy, government subsidies, more stations per site, etc.)

RESPONSE:

Aside from rates, in BC Hydro's view, over both the short and medium terms (i.e., one to five years), it is expected that EV sales will influence demand for electric vehicle charging service and accordingly station utilization. As the number of EVs on the road increases, it is expected that there will be a proportional increase in the demand for EV fast charging services. For a specific fast charging station, the increase of utilization (i.e., the demand for the service) may be influenced by the numbers of stations in the vicinity offered by other operators (i.e., the supply of the service) and their respective pricing structures.

16.0 C. RATE DESIGN

Reference: RATE DESIGN
Exhibit B-1, Section 3.1, p. 15, Section 4.2, pp. 31–32
Utilization rate assumptions

On page 32, BC Hydro states that "[w]hen the service was free, the average utilization was 15 per cent."

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very high demand-charge costs on the network operators because of the spiky, infrequent nature of the load of a public DCFC. We detailed this issue in depth in our March 2017 report, *EVgo Fleet and Tariff Analysis*. We believe that when utilization rates on DCFC charging stations increase to roughly 30%, the charging stations will be able to operate profitably under a typical utility tariff while at the same time offering pricing to EV drivers that is at parity with refueling using gasoline or diesel.[ii] But until the EV market matures considerably and the demand for public DCFC charging grows to increase the utilization rates of the chargers, most tariffs currently offered by utilities are untenable and are inhibiting the growth of public fast-charging networks.

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- A 30% utilization rate for the next four years to represent what a typical public DCFC load might look like as the market matures

1.16.5.1 Does BC Hydro expect the utilization rate to increase/decrease over the next three years? Five years? If so, at what rate annually?

RESPONSE:

BC Hydro expects that once the interim rate is in place on May 1, 2021, station utilization rates will decrease at stations where alternate charging opportunities exist (e.g., urban/suburban stations and the corridor stations located in population centres). Stations along driving corridors without a significant population nearby (e.g., Britton Creek, Rogers Pass) are expected to experience only a minor decrease in station utilization.

Following these initial decreases in station utilization, BC Hydro expects utilization rates to increase, and the increase will likely be proportional to the growth in EV sales and may be influenced by fast charging service offered by other operators as explained in BC Hydro's response to BCUC IR 1.16.5.

BC Hydro proposes to monitor several aspects of the fast charging service, including station utilization (at different power levels), revenue collected under the applicable Rate Schedules, costs incurred, and customer feedback, and provide an evaluation report to the BCUC by March 31, 2024 as described in section 5 of the Application.

17.0 C. RATE DESIGN

Reference: RATE DESIGN
Exhibit B-1, Section 3.2, p. 21–22, Section 4.3, pp. 33–34
Special conditions

On page 33, BC Hydro states that "[i]n the proposed RS 1360, RS 1560 and RS 1561 (shown in Appendix B) BC Hydro proposes several special conditions specific to fast charging service. Feedback on these proposed special conditions was sought during the public engagement session as shown in section 3.2."

On page 21, BC Hydro describes the special conditions on which it sought feedback from survey respondents:

1. BC Hydro can temporarily waive the rate for an individual charger or station site to maintain the service rather than shutting down individual chargers if they are not fully functioning (e.g., due to charger only partially functioning, maintenance, new charger commissioning, IT system errors, or issues with physical access, local cellular network, lighting and signage).
2. BC Hydro can treat electric vehicle drivers as a unique customer group but cannot guarantee security and privacy with respect to its EV mobile app user profile and web services required to use the charging station service.
3. BC Hydro can provide additional charger activation options but cannot guarantee roaming activation via third-parties.

On page 22, BC Hydro notes that the special conditions No. 1, No. 2 and No. 3 received 40, 22 and 25 percent support respectively.

In the proposed RS 1360, RS 1560 and RS 1561, the special conditions read as follows:

Special Conditions	1. BC Hydro does not guarantee charging speeds at a Fast Charging Station. 2. BC Hydro may disconnect, interrupt or terminate Service at a Fast Charging Station due to existing or expected system, safety, accessibility, technical, environmental or other constraints at a Charging Site or at a Fast Charging Station as determined by BC Hydro. BC Hydro will, whenever practical, give notice of such disconnection, interruption, or termination to Customers, by posting information at the Fast Charging Station and the Charging Site and on a relevant third party website. In the event of a disconnection or interruption of Service, BC Hydro, whenever possible, to provide information on the expected duration of disconnection or interruption.

	Neither BC Hydro nor any of its representatives or agent will be responsible or liable for any loss, injury, damage or expense caused by or resulting from such disconnection, interruption, or termination. 3. A Customer using the Fast Charging Station is solely responsible for the supply, compatibility, connectivity, safety and use of any third party equipment, device, hardware, software and telecommunications networks necessary for the use of the Fast Charging Station, including any and all fees. In addition to and without restriction of any other limitations of liability of BC Hydro, BC Hydro is specifically not liable for any loss, damage, injury or expense caused by or resulting from the use of such third party equipment, device, hardware, software and telecommunications networks. 4. If a Customer intends to use a BC Hydro radio frequency identification card (**RFID**) to receive Service from a Fast Charging Station, a one-time fee of $15 will be applied for the initial purchase of the RFID card.

	5. The Customer taking Service under this Rate Schedule will be billed in Canadian currency and make payment of the billed amount in full at the end of each Charging Session, through a payment method accepted by BC Hydro. Subject to Special Condition No. 4, no other fees or charges in addition to the billed amount will be applicable for the use of a Fast Charging Station. For greater certainty, back-billing or re-billing because the original billings were discovered to be either too high (over-billed) or too low (under-billed) is inapplicable to the Service. 6. BC Hydro may, in its sole discretion, waive all or part of the payment owed to BC Hydro for each Charging Session. The cause of the waiver may include metering or billing errors not attributable to, or beyond the reasonable control of, the Customer using the Fast Charging Station.

1.17.1 Please explain why BC Hydro has not included any of the special conditions on which it sought feedback in the proposed RS 1360, RS 1560 and RS 1561.

RESPONSE:

BC Hydro sought public feedback on Special Condition 3 and 6 either prior to or subsequent to the public engagement session on December 7, 2020. While BC Hydro did not seek feedback on the exact same wordings of two special conditions (Special Condition 3 and 6), BC Hydro did seek input on the concept of those conditions that are included in the special conditions of the proposed RS 1360, RS 1560 and RS 1561.

Special Condition 3 reflects the unique nature of providing the fast charging service, such as accessibility through third-party equipment or device. As indicated in the preamble, BC Hydro sought feedback from survey respondents regarding security of mobile apps and inability to guarantee roaming activation through third-parties.

Special Condition 6 regarding BC Hydro's ability to waive all or part of payment in its sole discretion is reflected from the feedback from survey respondents regarding temporary waiving of rate for charging sessions.

BC Hydro did not seek specific feedback on Special Condition 1 and 2 prior to the public engagement on December 7, 2020, because they are similar to the terms and conditions of BC Hydro's Electric Tariff. More specially, Special Condition 1 is similar to section 9.5 of the Electric Tariff (Liability of BC Hydro). BC Hydro discussed this concept during the public engagement session as shown in page 39 of Appendix E.

BC Hydro did not seek feedback on Special Condition 4 and 5 because those topics were not yet under consideration as Special Conditions at the time of the public engagement session.

Appendix F to the Application provides a summary of the feedback received following the public consultation session on December 7, 2020.

17.0 C. RATE DESIGN

Reference: RATE DESIGN
Exhibit B-1, Section 3.2, p. 21–22, Section 4.3, pp. 33–34
Special conditions

On page 33, BC Hydro states that "[i]n the proposed RS 1360, RS 1560 and RS 1561 (shown in Appendix B) BC Hydro proposes several special conditions specific to fast charging service. Feedback on these proposed special conditions was sought during the public engagement session as shown in section 3.2."

On page 21, BC Hydro describes the special conditions on which it sought feedback from survey respondents:

1. BC Hydro can temporarily waive the rate for an individual charger or station site to maintain the service rather than shutting down individual chargers if they are not fully functioning (e.g., due to charger only partially functioning, maintenance, new charger commissioning, IT system errors, or issues with physical access, local cellular network, lighting and signage).
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On page 22, BC Hydro notes that the special conditions No. 1, No. 2 and No. 3 received 40, 22 and 25 percent support respectively.

In the proposed RS 1360, RS 1560 and RS 1561, the special conditions read as follows:

Special Conditions	1. BC Hydro does not guarantee charging speeds at a Fast Charging Station. 2. BC Hydro may disconnect, interrupt or terminate Service at a Fast Charging Station due to existing or expected system, safety, accessibility, technical, environmental or other constraints at a Charging Site or at a Fast Charging Station as determined by BC Hydro. BC Hydro will, whenever practical, give notice of such disconnection, interruption, or termination to Customers, by posting information at the Fast Charging Station and the Charging Site and on a relevant third party website. In the event of a disconnection or interruption of Service, BC Hydro, whenever possible, to provide information on the expected duration of disconnection or interruption.

	Neither BC Hydro nor any of its representatives or agent will be responsible or liable for any loss, injury, damage or expense caused by or resulting from such disconnection, interruption, or termination. 3. A Customer using the Fast Charging Station is solely responsible for the supply, compatibility, connectivity, safety and use of any third party equipment, device, hardware, software and telecommunications networks necessary for the use of the Fast Charging Station, including any and all fees. In addition to and without restriction of any other limitations of liability of BC Hydro, BC Hydro is specifically not liable for any loss, damage, injury or expense caused by or resulting from the use of such third party equipment, device, hardware, software and telecommunications networks. 4. If a Customer intends to use a BC Hydro radio frequency identification card (**RFID**) to receive Service from a Fast Charging Station, a one-time fee of $15 will be applied for the initial purchase of the RFID card.

	5. The Customer taking Service under this Rate Schedule will be billed in Canadian currency and make payment of the billed amount in full at the end of each Charging Session, through a payment method accepted by BC Hydro. Subject to Special Condition No. 4, no other fees or charges in addition to the billed amount will be applicable for the use of a Fast Charging Station. For greater certainty, back-billing or re-billing because the original billings were discovered to be either too high (over-billed) or too low (under-billed) is inapplicable to the Service. 6. BC Hydro may, in its sole discretion, waive all or part of the payment owed to BC Hydro for each Charging Session. The cause of the waiver may include metering or billing errors not attributable to, or beyond the reasonable control of, the Customer using the Fast Charging Station.

1.17.2 Please clarify if BC Hydro sought feedback on any of the special conditions it has included in the proposed RS 1360, RS 1560 and RS 1561. If not, please explain why not. If yes, please provide the feedback received.

RESPONSE:

Please refer to BC Hydro's response to BCUC IR 1.17.1.

17.0 C. RATE DESIGN

Reference: RATE DESIGN
Exhibit B-1, Section 3.2, p. 21–22, Section 4.3, pp. 33–34
Special conditions

On page 33, BC Hydro states that "[i]n the proposed RS 1360, RS 1560 and RS 1561 (shown in Appendix B) BC Hydro proposes several special conditions specific to fast charging service. Feedback on these proposed special conditions was sought during the public engagement session as shown in section 3.2."

On page 21, BC Hydro describes the special conditions on which it sought feedback from survey respondents:

1. BC Hydro can temporarily waive the rate for an individual charger or station site to maintain the service rather than shutting down individual chargers if they are not fully functioning (e.g., due to charger only partially functioning, maintenance, new charger commissioning, IT system errors, or issues with physical access, local cellular network, lighting and signage).
2. BC Hydro can treat electric vehicle drivers as a unique customer group but cannot guarantee security and privacy with respect to its EV mobile app user profile and web services required to use the charging station service.
3. BC Hydro can provide additional charger activation options but cannot guarantee roaming activation via third-parties.

On page 22, BC Hydro notes that the special conditions No. 1, No. 2 and No. 3 received 40, 22 and 25 percent support respectively.

In the proposed RS 1360, RS 1560 and RS 1561, the special conditions read as follows:

Special Conditions	1. BC Hydro does not guarantee charging speeds at a Fast Charging Station. 2. BC Hydro may disconnect, interrupt or terminate Service at a Fast Charging Station due to existing or expected system, safety, accessibility, technical, environmental or other constraints at a Charging Site or at a Fast Charging Station as determined by BC Hydro. BC Hydro will, whenever practical, give notice of such disconnection, interruption, or termination to Customers, by posting information at the Fast Charging Station and the Charging Site and on a relevant third party website. In the event of a disconnection or interruption of Service, BC Hydro, whenever possible, to provide information on the expected duration of disconnection or interruption.

	Neither BC Hydro nor any of its representatives or agent will be responsible or liable for any loss, injury, damage or expense caused by or resulting from such disconnection, interruption, or termination. 3. A Customer using the Fast Charging Station is solely responsible for the supply, compatibility, connectivity, safety and use of any third party equipment, device, hardware, software and telecommunications networks necessary for the use of the Fast Charging Station, including any and all fees. In addition to and without restriction of any other limitations of liability of BC Hydro, BC Hydro is specifically not liable for any loss, damage, injury or expense caused by or resulting from the use of such third party equipment, device, hardware, software and telecommunications networks. 4. If a Customer intends to use a BC Hydro radio frequency identification card (**RFID**) to receive Service from a Fast Charging Station, a one-time fee of $15 will be applied for the initial purchase of the RFID card.

	5. The Customer taking Service under this Rate Schedule will be billed in Canadian currency and make payment of the billed amount in full at the end of each Charging Session, through a payment method accepted by BC Hydro. Subject to Special Condition No. 4, no other fees or charges in addition to the billed amount will be applicable for the use of a Fast Charging Station. For greater certainty, back-billing or re-billing because the original billings were discovered to be either too high (over-billed) or too low (under-billed) is inapplicable to the Service. 6. BC Hydro may, in its sole discretion, waive all or part of the payment owed to BC Hydro for each Charging Session. The cause of the waiver may include metering or billing errors not attributable to, or beyond the reasonable control of, the Customer using the Fast Charging Station.

1.17.2.1 Regarding proposed special condition No. 1, did BC Hydro seek feedback from respondents on a special condition stating that "BC Hydro does not guarantee charging speeds at a Fast Charging Station" while it would have explained to respondents that this condition would be attached to a time-based rate? If not, please explain why not. If yes, please provide the feedback received.

RESPONSE:

Please refer to BC Hydro's response to BCUC IR 1.17.1 where BC Hydro discusses the feedback received with respect to the special conditions in the proposed Rate Schedules.

17.0 C. RATE DESIGN

Reference: RATE DESIGN
Exhibit B-1, Section 3.2, p. 21–22, Section 4.3, pp. 33–34
Special conditions

On page 33, BC Hydro states that "[i]n the proposed RS 1360, RS 1560 and RS 1561 (shown in Appendix B) BC Hydro proposes several special conditions specific to fast charging service. Feedback on these proposed special conditions was sought during the public engagement session as shown in section 3.2."

On page 21, BC Hydro describes the special conditions on which it sought feedback from survey respondents:

1. BC Hydro can temporarily waive the rate for an individual charger or station site to maintain the service rather than shutting down individual chargers if they are not fully functioning (e.g., due to charger only partially functioning, maintenance, new charger commissioning, IT system errors, or issues with physical access, local cellular network, lighting and signage).
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On page 22, BC Hydro notes that the special conditions No. 1, No. 2 and No. 3 received 40, 22 and 25 percent support respectively.

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Special Conditions	1. BC Hydro does not guarantee charging speeds at a Fast Charging Station. 2. BC Hydro may disconnect, interrupt or terminate Service at a Fast Charging Station due to existing or expected system, safety, accessibility, technical, environmental or other constraints at a Charging Site or at a Fast Charging Station as determined by BC Hydro. BC Hydro will, whenever practical, give notice of such disconnection, interruption, or termination to Customers, by posting information at the Fast Charging Station and the Charging Site and on a relevant third party website. In the event of a disconnection or interruption of Service, BC Hydro, whenever possible, to provide information on the expected duration of disconnection or interruption.

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1.17.2.2 Regarding proposed special condition No. 1, would BC Hydro be amenable to add a brief explanation of why it does not guarantee charging speeds, such as “because the actual charging speed can vary based on [list all the variables that can affect the charging speed]”.

RESPONSE:

BC Hydro does not support including the suggested text in the Electric Tariff.

Providing descriptive information regarding Customer-owned equipment is not standard practice for the Electric Tariff, which aims to be a concise document providing the terms, conditions and rates for electrical service.

BC Hydro notes that the type of information described in this information request is publicly posted at bchydro.com. For an example, please see the links below.

https://electricvehicles.bchydro.com/how-use-our-fast-chargers/how-long-will-my-charge-take

https://electricvehicles.bchydro.com/how-use-our-fast-chargers/why-does-my-ev-get-different-range-each-time

17.0 C. RATE DESIGN

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Exhibit B-1, Section 3.2, p. 21–22, Section 4.3, pp. 33–34
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Special Conditions	1. BC Hydro does not guarantee charging speeds at a Fast Charging Station. 2. BC Hydro may disconnect, interrupt or terminate Service at a Fast Charging Station due to existing or expected system, safety, accessibility, technical, environmental or other constraints at a Charging Site or at a Fast Charging Station as determined by BC Hydro. BC Hydro will, whenever practical, give notice of such disconnection, interruption, or termination to Customers, by posting information at the Fast Charging Station and the Charging Site and on a relevant third party website. In the event of a disconnection or interruption of Service, BC Hydro, whenever possible, to provide information on the expected duration of disconnection or interruption.

	Neither BC Hydro nor any of its representatives or agent will be responsible or liable for any loss, injury, damage or expense caused by or resulting from such disconnection, interruption, or termination. 3. A Customer using the Fast Charging Station is solely responsible for the supply, compatibility, connectivity, safety and use of any third party equipment, device, hardware, software and telecommunications networks necessary for the use of the Fast Charging Station, including any and all fees. In addition to and without restriction of any other limitations of liability of BC Hydro, BC Hydro is specifically not liable for any loss, damage, injury or expense caused by or resulting from the use of such third party equipment, device, hardware, software and telecommunications networks. 4. If a Customer intends to use a BC Hydro radio frequency identification card (**RFID**) to receive Service from a Fast Charging Station, a one-time fee of $15 will be applied for the initial purchase of the RFID card.

	5. The Customer taking Service under this Rate Schedule will be billed in Canadian currency and make payment of the billed amount in full at the end of each Charging Session, through a payment method accepted by BC Hydro. Subject to Special Condition No. 4, no other fees or charges in addition to the billed amount will be applicable for the use of a Fast Charging Station. For greater certainty, back-billing or re-billing because the original billings were discovered to be either too high (over-billed) or too low (under-billed) is inapplicable to the Service. 6. BC Hydro may, in its sole discretion, waive all or part of the payment owed to BC Hydro for each Charging Session. The cause of the waiver may include metering or billing errors not attributable to, or beyond the reasonable control of, the Customer using the Fast Charging Station.

1.17.2.3 Regarding proposed special condition No. 2, would BC Hydro also give notice to customers of the disconnection, interruption, or termination of service by posting information on the BC Hydro EV App and the third-party EV networks' mobile apps with whom it has established roaming agreements (e.g., FLO and ChargePoint)?

RESPONSE:

Currently, only PlugShare and ChargeHub allow the "operator" to post text-based messaging and status notices. The BC Hydro EV App and roaming apps do not currently have the functionality for the "operator" to post text-based messages.

For any significant multi-site messaging, BC Hydro will use its additional communications channels such as bchydro.com.

17.0 C. RATE DESIGN

Reference: RATE DESIGN
Exhibit B-1, Section 3.2, p. 21–22, Section 4.3, pp. 33–34
Special conditions

On page 33, BC Hydro states that "[i]n the proposed RS 1360, RS 1560 and RS 1561 (shown in Appendix B) BC Hydro proposes several special conditions specific to fast charging service. Feedback on these proposed special conditions was sought during the public engagement session as shown in section 3.2."

On page 21, BC Hydro describes the special conditions on which it sought feedback from survey respondents:

1. BC Hydro can temporarily waive the rate for an individual charger or station site to maintain the service rather than shutting down individual chargers if they are not fully functioning (e.g., due to charger only partially functioning, maintenance, new charger commissioning, IT system errors, or issues with physical access, local cellular network, lighting and signage).
2. BC Hydro can treat electric vehicle drivers as a unique customer group but cannot guarantee security and privacy with respect to its EV mobile app user profile and web services required to use the charging station service.
3. BC Hydro can provide additional charger activation options but cannot guarantee roaming activation via third-parties.

On page 22, BC Hydro notes that the special conditions No. 1, No. 2 and No. 3 received 40, 22 and 25 percent support respectively.

In the proposed RS 1360, RS 1560 and RS 1561, the special conditions read as follows:

Special Conditions	1. BC Hydro does not guarantee charging speeds at a Fast Charging Station. 2. BC Hydro may disconnect, interrupt or terminate Service at a Fast Charging Station due to existing or expected system, safety, accessibility, technical, environmental or other constraints at a Charging Site or at a Fast Charging Station as determined by BC Hydro. BC Hydro will, whenever practical, give notice of such disconnection, interruption, or termination to Customers, by posting information at the Fast Charging Station and the Charging Site and on a relevant third party website. In the event of a disconnection or interruption of Service, BC Hydro, whenever possible, to provide information on the expected duration of disconnection or interruption.

	Neither BC Hydro nor any of its representatives or agent will be responsible or liable for any loss, injury, damage or expense caused by or resulting from such disconnection, interruption, or termination. 3. A Customer using the Fast Charging Station is solely responsible for the supply, compatibility, connectivity, safety and use of any third party equipment, device, hardware, software and telecommunications networks necessary for the use of the Fast Charging Station, including any and all fees. In addition to and without restriction of any other limitations of liability of BC Hydro, BC Hydro is specifically not liable for any loss, damage, injury or expense caused by or resulting from the use of such third party equipment, device, hardware, software and telecommunications networks. 4. If a Customer intends to use a BC Hydro radio frequency identification card (**RFID**) to receive Service from a Fast Charging Station, a one-time fee of $15 will be applied for the initial purchase of the RFID card.

	5. The Customer taking Service under this Rate Schedule will be billed in Canadian currency and make payment of the billed amount in full at the end of each Charging Session, through a payment method accepted by BC Hydro. Subject to Special Condition No. 4, no other fees or charges in addition to the billed amount will be applicable for the use of a Fast Charging Station. For greater certainty, back-billing or re-billing because the original billings were discovered to be either too high (over-billed) or too low (under-billed) is inapplicable to the Service. 6. BC Hydro may, in its sole discretion, waive all or part of the payment owed to BC Hydro for each Charging Session. The cause of the waiver may include metering or billing errors not attributable to, or beyond the reasonable control of, the Customer using the Fast Charging Station.

1.17.2.4 Regarding proposed special condition No. 5, please clarify which instances could lead to original billings being either too high or too low.

RESPONSE:

BC Hydro is not aware of all the potential under-billing or over-billing scenarios at this time. As an example, an over-billing scenario could occur if the internal timing device in the charging station does not stop when the session ends, which results in the customer being billed for a longer session than the actual charging period.

Special Condition No. 6 is specifically proposed to allow BC Hydro to consider any billing disputes and adjust the billed amount without having to seek a variance from the approved rates (if required).

17.0 C. RATE DESIGN

Reference: RATE DESIGN
Exhibit B-1, Section 3.2, p. 21–22, Section 4.3, pp. 33–34
Special conditions

On page 33, BC Hydro states that "[i]n the proposed RS 1360, RS 1560 and RS 1561 (shown in Appendix B) BC Hydro proposes several special conditions specific to fast charging service. Feedback on these proposed special conditions was sought during the public engagement session as shown in section 3.2."

On page 21, BC Hydro describes the special conditions on which it sought feedback from survey respondents:

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	5. The Customer taking Service under this Rate Schedule will be billed in Canadian currency and make payment of the billed amount in full at the end of each Charging Session, through a payment method accepted by BC Hydro. Subject to Special Condition No. 4, no other fees or charges in addition to the billed amount will be applicable for the use of a Fast Charging Station. For greater certainty, back-billing or re-billing because the original billings were discovered to be either too high (over-billed) or too low (under-billed) is inapplicable to the Service. 6. BC Hydro may, in its sole discretion, waive all or part of the payment owed to BC Hydro for each Charging Session. The cause of the waiver may include metering or billing errors not attributable to, or beyond the reasonable control of, the Customer using the Fast Charging Station.

1.17.2.5 Regarding proposed special condition No. 6, would the term "refund" instead of "waive" be more appropriate since customers would have already paid for the session immediately at the end of the session and therefore, if they were later disputing the bill, BC Hydro would refund all or part of the payment rather than waiving all or part of the payment? Please explain.

RESPONSE:

BC Hydro uses the word "waive" to reflect the fact that may be situations where the customers will be allowed to charge an electric vehicle without any payment, due to, for instance, technical issues to connect to local cellular networks for payment.

17.0 C. RATE DESIGN

Reference: RATE DESIGN
Exhibit B-1, Section 3.2, p. 21–22, Section 4.3, pp. 33–34
Special conditions

On page 34, BC Hydro states:

> If a fast charging service Customer contacts BC Hydro to dispute a bill, then BC Hydro has the discretion to waive payment if the Customer experienced operational issues outside their control such as local cellular network issues, physical access barriers, or information technology system errors.

1.17.3 Please clarify how a customer facing physical access barriers could start a charging session and be billed for it.

RESPONSE:

Physical barriers are those that significantly impede the customer from being able to access the charging station. Either absolute barrier (such as road closed), or a partial barrier that the customer may be able to overcome with additional individual effort (such as the station is blocked by an object, but the customer is able to reach the cable around the object, which may put extreme strain on the cable or vehicle connection point).

A significant accumulation of snow that the Customer had to clear in order to access the Charging Site provides an example of a physical access barrier where a Customer may still be able to start, complete and be billed for a Charging Session.

On further consideration, BC Hydro has determined that if a Customer was facing physical access barriers and was still able to start, complete and be billed for a Charging Session, then payment should not be waived. We have updated our business practices to reflect this change.

17.0 C. RATE DESIGN

Reference: RATE DESIGN
Exhibit B-1, Section 3.2, p. 21–22, Section 4.3, pp. 33–34
Special conditions

On page 34, BC Hydro states:

> If a fast charging service Customer contacts BC Hydro to dispute a bill, then BC Hydro has the discretion to waive payment if the Customer experienced operational issues outside their control such as local cellular network issues, physical access barriers, or information technology system errors.

1.17.4 Please clarify how local cellular network issues could affect the charging sessions, and therefore the bill.

RESPONSE:

Customers activating with a mobile application (such as BC Hydro Mobile App) or with a credit card for one-time access generally require their own cellular network to be fully functional as well as the network to which the charging station is connected. If there is a local cellular network issue to either the network to which the station is connected or the network to which the mobile application is connected, there may result in a billing error to the customer.

18.0 C. RATE DESIGN

Reference: RATE DESIGN
Exhibit B-1, Section 3.1, p. 18, Section 4.4, p. 35; Tesla website, Supercharging section[1]; Electrify Canada website, Pricing section[2]
Idle fees

On page 35, BC Hydro states that "per minute charge discourages inefficient use of stations by reducing wait times." On page 18 of the Application, BC Hydro states:

> Time-versus electricity-based pricing: Respondents overwhelmingly favour electricity-based pricing. Time-based pricing is viewed as unfair due to variability in the amount of electricity dispensed from a charger arising from factors such as the electric vehicle make and model and the outside air temperatures. Time-based pricing has some support from those who believe it might encourage drivers to not linger too long at the station.

1.18.1 Please elaborate what is meant by encouraging drivers "to not linger too long at the station". Could this be interpreted as support for the proposed time-based rate given that once an EV charging station is occupied, it prevents other users from charging and therefore the amount of electricity delivered is less relevant?

RESPONSE:

For many EV models, the speed of charging falls significantly once the vehicle is charged to or exceeding about 90 per cent and the charging enters the "slow" charging period. A time-based rate could deter customers from continuing to charge their vehicles when the vehicles enter the "slow" charging period.

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1 https://www.tesla.com/en_CA/support/supercharging#idle-fee [retrieved on April 16, 2021]

2 https://www.electrify-canada.ca/pricing/ [retrieved on April 16, 2021]

18.0 C. RATE DESIGN

Reference: RATE DESIGN
Exhibit B-1, Section 3.1, p. 18, Section 4.4, p. 35; Tesla website, Supercharging section[1]; Electrify Canada website, Pricing section[2]
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1.18.1.1 Please discuss any other advantages or rationale to implement a time-based rate.

RESPONSE:

As discussed in section 2.2 of the Application, only a time-based rate is possible at this time due to the lack of a Measurement Canadian approved standard to measure direct current (DC) power. In addition to discouraging customers from lingering at the station when the vehicle is charged to certain level a time-based rate at this time also has the following advantages:

- **They are practical for BC Hydro to administer; and**
- **They are also easy for customers to understand. Given the Proposed Rates are BC Hydro's first rates for electric vehicle fast charging services, simple rate design is preferable at this time.**

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1 https://www.tesla.com/en_CA/support/supercharging#idle-fee [retrieved on April 16, 2021]
2 https://www.electrify-canada.ca/pricing/ [retrieved on April 16, 2021]

18.0 C. RATE DESIGN

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1.18.2 What other considerations or rate design alternatives has BC Hydro considered in order to encourage customers "to not linger too long at the station"?

RESPONSE:

Due to metering and billing limitations as discussed in section 2.2 of the Application, BC Hydro is limited to a time-based rate design at this time.

BC Hydro does post information on our website to encourage good charging station etiquette, including not to linger too long at the station. For an example see the link below.

https://electricvehicles.bchydro.com/how-use-our-fast-chargers/how-long-can-i-charge-fast-charging-station

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1 https://www.tesla.com/en_CA/support/supercharging#idle-fee [retrieved on April 16, 2021]
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Idle fees

On the Supercharging section of its website, Tesla describes idle fees:

> Idle fee
>
> **What are idle fees?**
> Idle fees apply to any car occupying a Supercharger if the station is at least 50% full and once the charge session is complete. If the car is moved within 5 minutes of the charge session completion, the fee is waived. To be clear, this is purely about increasing customer happiness and we hope to never make any money from it.
>
> **How long can I park at a Supercharger?**
> Once your vehicle has reached the range necessary to get to your next destination, please move your vehicle so other drivers can charge. Vehicles parked at a Supercharger beyond an active charge session will be subject to idle fees.

> Supercharger Idle Fee
>
> We designed the Supercharger network to enable a seamless, enjoyable road trip experience. Therefore, we understand that it can be frustrating to arrive at a station only to discover fully charged Tesla cars occupying spaces. To create a better experience for all owners, we're introducing a fleet-wide idle fee that aims to increase Supercharger availability.
>
> We envision a future where cars move themselves once fully charged, enhancing network efficiency and the customer experience even further. Until then, we ask that vehicles be moved from the Supercharger once fully charged. A customer would never leave a car parked by the pump at a gas station and the same thinking applies with Superchargers.
>
> The Tesla app allows owners to remotely monitor their vehicle, alerting them when their charge is nearly complete and again once fully charged. For every additional minute a car remains connected to the Supercharger, it will incur an idle fee. If the car is moved within 5 minutes, the fee is waived. Idle fees only apply when a Supercharger station is at 50% capacity or more. Idle fees double when the station is at 100% capacity. To be clear, this is purely about increasing customer happiness and we hope to never make any money from it.

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2 https://www.electrify-canada.ca/pricing/ [retrieved on April 16, 2021]

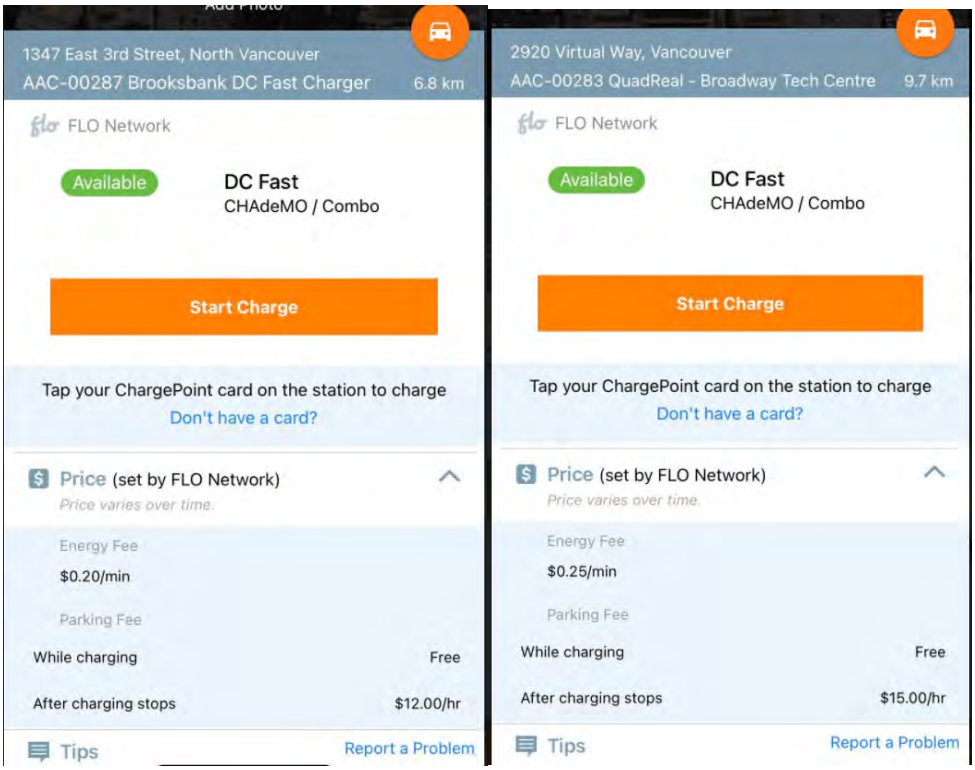
Idle Fees By Country

Country	Currency	Idle fee (per minute)	Idle fee (per minute) when the station is 100% occupied
United States	USD	$0.50	$1.00
Canada	CAD	$0.50	$1.00

On the Pricing section of its website, Electrify Canada described idle fees:

Idle Fee: Once charging stops, you pay $0.40/min. after a 10-minute grace period.

On the FLO Network, the following fees are shown for DC Fast Chargers, where an energy fee of either $0.20/min ($12.00/hour) or $0.25/min ($15.00/hour) is charged to the customer when the car is charging (while no parking fee is charged) and after charging, a parking fee set at the same level is charged.



1.18.3 Please discuss the pros and cons of idle fees.

RESPONSE:

The Idle fees, as described in the preamble, could dissuade users of a fast charging station from occupying the station longer than necessary, thereby potentially as a means to maximize availability of fast charging stations for all users.

However, as described in BC Hydro's response to BCUC IR 1.18.7, it is not currently technically feasible to have an idle fee in BC Hydro's EV network billing platform. BC Hydro also does not have sufficient data or customer input regarding charging idle fees at this time. BC Hydro will collect data where possible and practical and will monitor customer behaviour with respect to idle time.

18.0 C. RATE DESIGN

Reference: RATE DESIGN
Exhibit B-1, Section 3.1, p. 18, Section 4.4, p. 35; Tesla website, Supercharging section[1]; Electrify Canada website, Pricing section[2]
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> **What are idle fees?**
> Idle fees apply to any car occupying a Supercharger if the station is at least 50% full and once the charge session is complete. If the car is moved within 5 minutes of the charge session completion, the fee is waived. To be clear, this is purely about increasing customer happiness and we hope to never make any money from it.
>
> **How long can I park at a Supercharger?**
> Once your vehicle has reached the range necessary to get to your next destination, please move your vehicle so other drivers can charge. Vehicles parked at a Supercharger beyond an active charge session will be subject to idle fees.

> Supercharger Idle Fee
>
> We designed the Supercharger network to enable a seamless, enjoyable road trip experience. Therefore, we understand that it can be frustrating to arrive at a station only to discover fully charged Tesla cars occupying spaces. To create a better experience for all owners, we're introducing a fleet-wide idle fee that aims to increase Supercharger availability.
>
> We envision a future where cars move themselves once fully charged, enhancing network efficiency and the customer experience even further. Until then, we ask that vehicles be moved from the Supercharger once fully charged. A customer would never leave a car parked by the pump at a gas station and the same thinking applies with Superchargers.
>
> The Tesla app allows owners to remotely monitor their vehicle, alerting them when their charge is nearly complete and again once fully charged. For every additional minute a car remains connected to the Supercharger, it will incur an idle fee. If the car is moved within 5 minutes, the fee is waived. Idle fees only apply when a Supercharger station is at 50% capacity or more. Idle fees double when the station is at 100% capacity. To be clear, this is purely about increasing customer happiness and we hope to never make any money from it.

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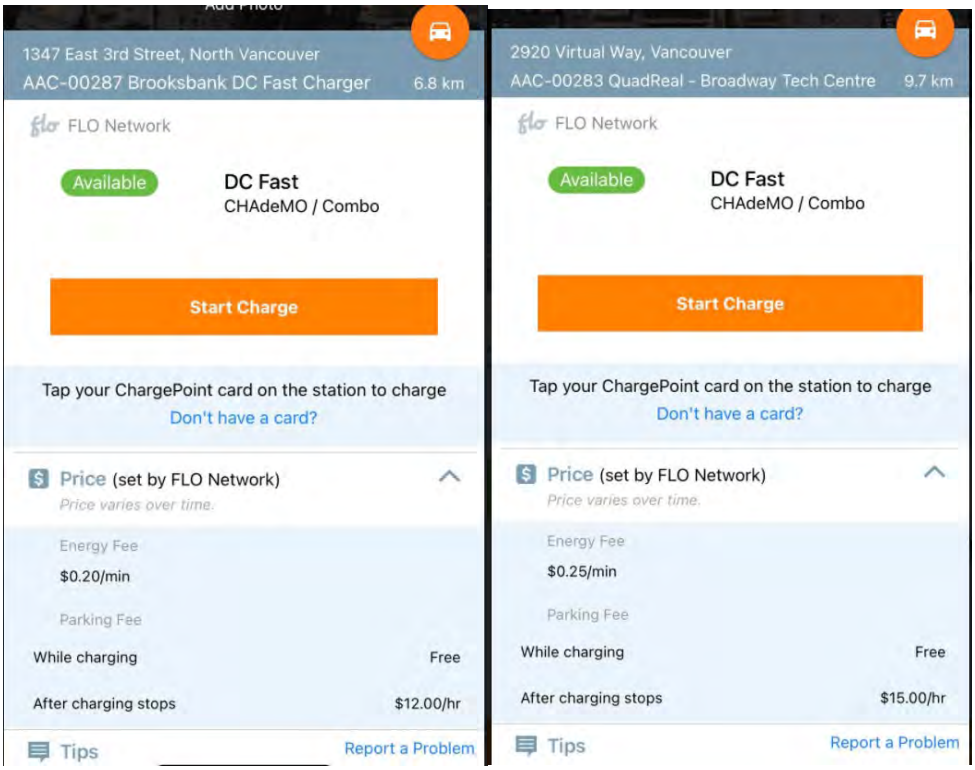
Idle Fee: Once charging stops, you pay $0.40/min. after a 10-minute grace period.

On the FLO Network, the following fees are shown for DC Fast Chargers, where an energy fee of either $0.20/min ($12.00/hour) or $0.25/min ($15.00/hour) is charged to the customer when the car is charging (while no parking fee is charged) and after charging, a parking fee set at the same level is charged.



1.18.4 Please confirm, or otherwise explain, that BC Hydro does not plan to charge idle fees to customers who continue to occupy a charging station once the charging is complete.

RESPONSE:

At this time, BC Hydro does not plan on charging an idle fee to customers who continue to occupy a charging station once the charging session is completed.

18.0 C. RATE DESIGN

Reference: RATE DESIGN
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> **How long can I park at a Supercharger?**
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> We envision a future where cars move themselves once fully charged, enhancing network efficiency and the customer experience even further. Until then, we ask that vehicles be moved from the Supercharger once fully charged. A customer would never leave a car parked by the pump at a gas station and the same thinking applies with Superchargers.
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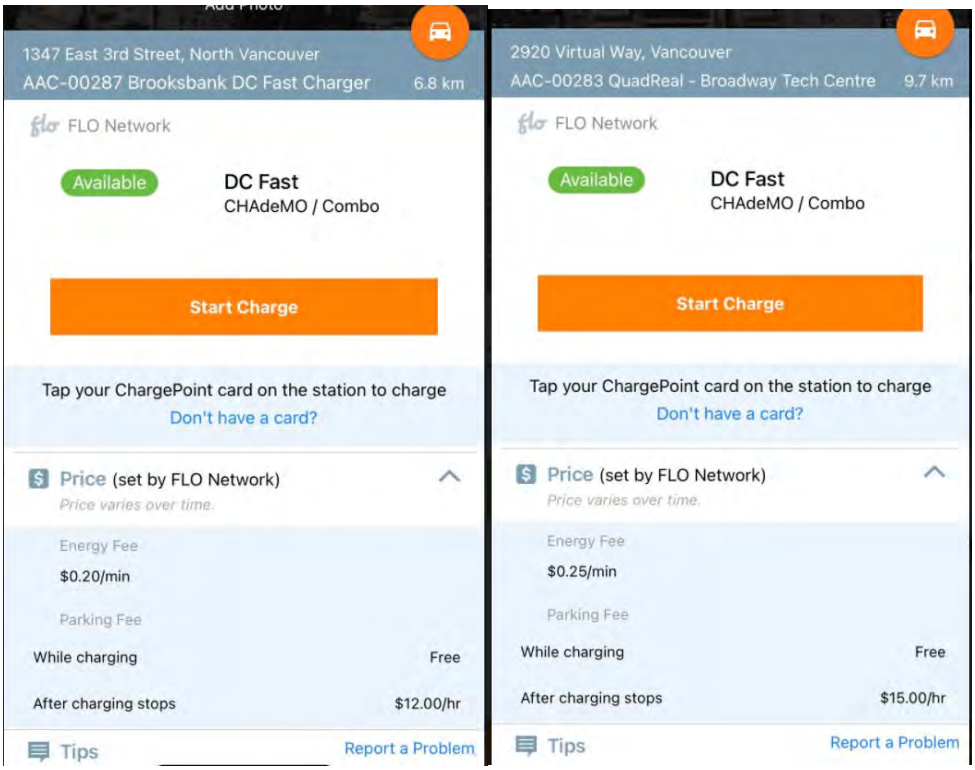

1.18.4 Please confirm, or otherwise explain, that BC Hydro does not plan to charge idle fees to customers who continue to occupy a charging station once the charging is complete.

1.18.4.1 Please discuss the rationale for not charging idle fees.

RESPONSE:

As described in BC Hydro's response to BCUC IR 1.18.7, it is not currently technically feasible to have an idle fee in BC Hydro's EV network billing platform. BC Hydro also does not have sufficient data or customer input regarding charging idle fees at this time. BC Hydro will collect data where possible and practical and will monitor customer behaviour with respect to idle time.

18.0 C. RATE DESIGN

Reference: RATE DESIGN
Exhibit B-1, Section 3.1, p. 18, Section 4.4, p. 35; Tesla website, Supercharging section[1]; Electrify Canada website, Pricing section[2]
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> Once your vehicle has reached the range necessary to get to your next destination, please move your vehicle so other drivers can charge. Vehicles parked at a Supercharger beyond an active charge session will be subject to idle fees.

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Idle Fees By Country

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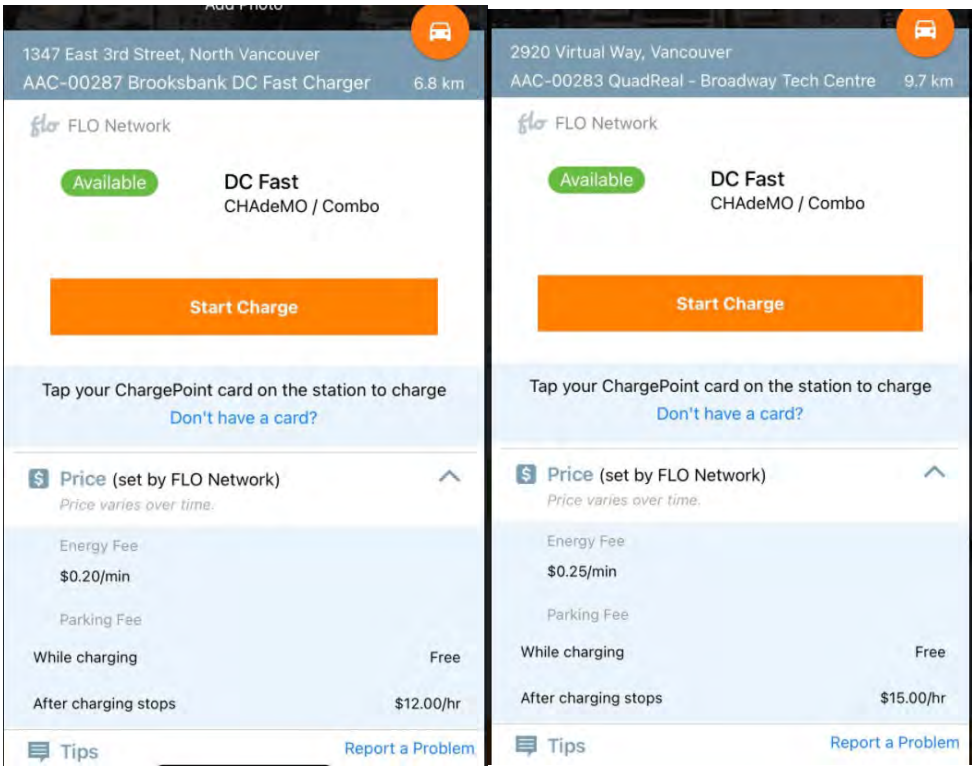
On the Pricing section of its website, Electrify Canada described idle fees:

Idle Fee: Once charging stops, you pay $0.40/min. after a 10-minute grace period.

On the FLO Network, the following fees are shown for DC Fast Chargers, where an energy fee of either $0.20/min ($12.00/hour) or $0.25/min ($15.00/hour) is charged to the customer when the car is charging (while no parking fee is charged) and after charging, a parking fee set at the same level is charged.



1.18.4 Please confirm, or otherwise explain, that BC Hydro does not plan to charge idle fees to customers who continue to occupy a charging station once the charging is complete.

1.18.4.2 On page 18 of the Application, BC Hydro indicated that time-based pricing has some support from those who believe it might encourage drivers to not linger too long at the station. Could idle fees also incent drivers "to not linger too long at the station"? Please discuss.

RESPONSE:

Yes, it's possible that idle fees (if designed and proactively communicated correctly) could incent drivers "to not linger too long at the station"

18.0 C. RATE DESIGN

Reference: RATE DESIGN
Exhibit B-1, Section 3.1, p. 18, Section 4.4, p. 35; Tesla website, Supercharging section[1]; Electrify Canada website, Pricing section[2]
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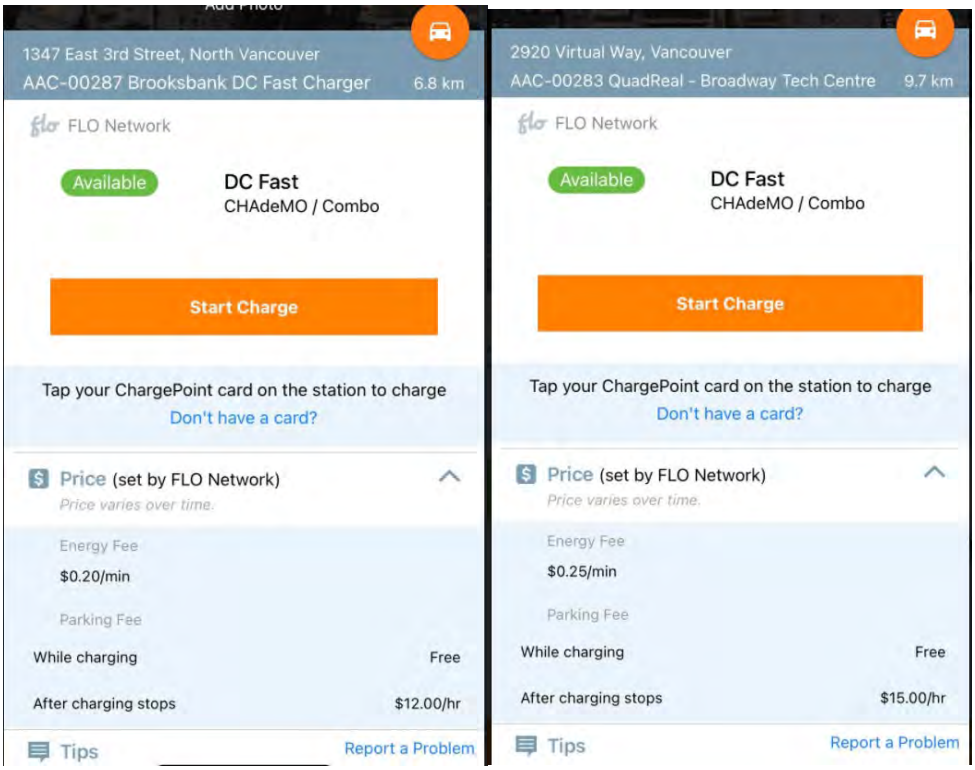

1.18.5 Are there any legal restrictions or implications for BC Hydro to charge idle fees? Please discuss.

RESPONSE:

BC Hydro is not aware of any legal restrictions against charging an "idle fee", assuming that the vehicle "idles" or the customer does not move the vehicle immediately after charging at a fast charging station.

18.0 C. RATE DESIGN

Reference: RATE DESIGN
Exhibit B-1, Section 3.1, p. 18, Section 4.4, p. 35; Tesla website, Supercharging section[1]; Electrify Canada website, Pricing section[2]
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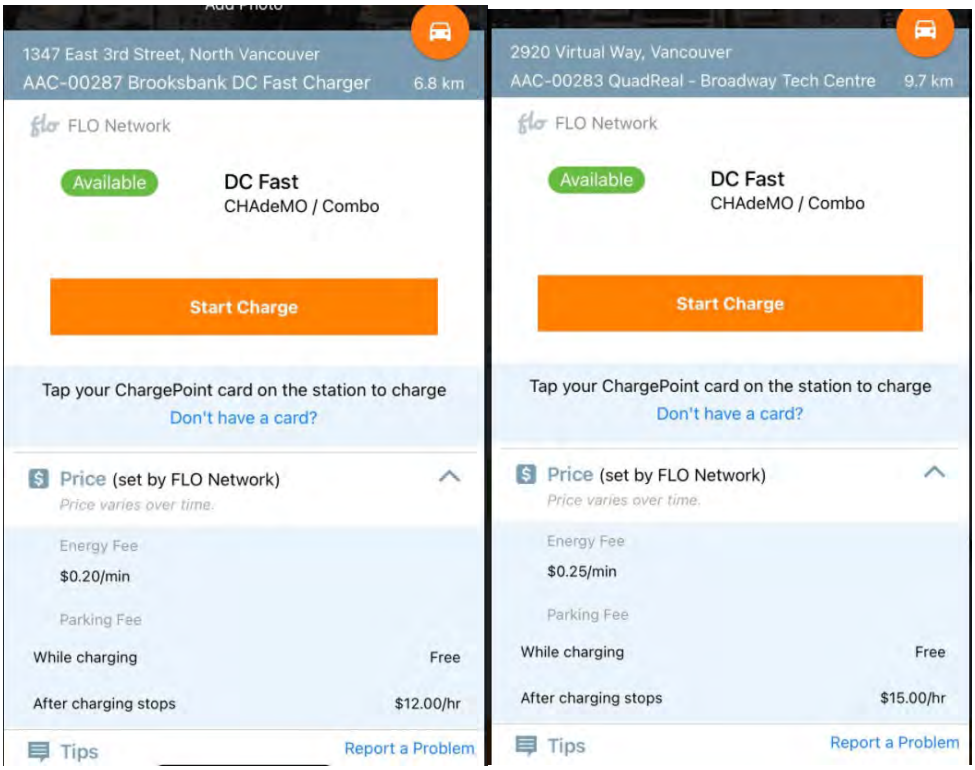
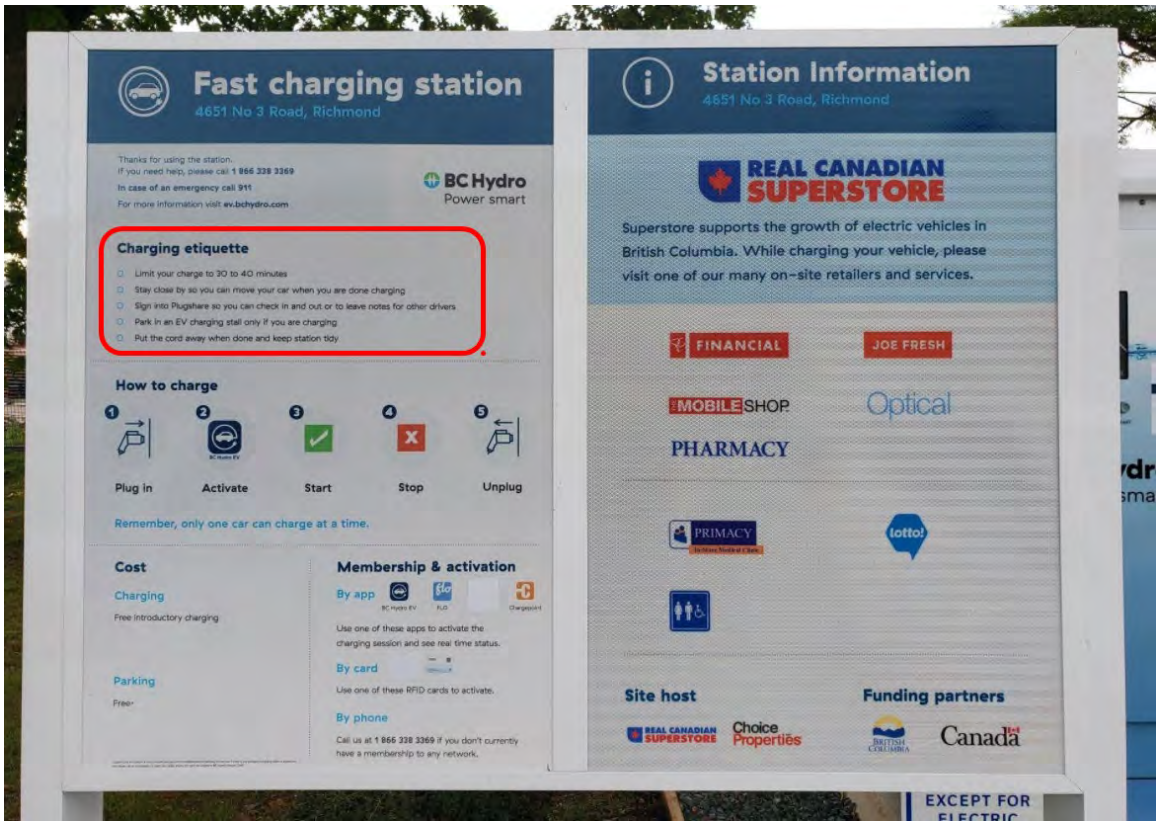


1.18.6 Please discuss how BC Hydro plans to prevent EV drivers to remain connected to the station and/or parked in the EV charging stall after the charging session has stopped.

RESPONSE:

BC Hydro will focus on educating EV drivers and at this time and will not prevent EV drivers from remaining connected after the charging session has stopped. To this end, BC Hydro has posted "Etiquette" signage at most station sites as well as on bchydro.com as shown below.

A time-based rate may also discourage customers from lingering at a station.



18.0 C. RATE DESIGN

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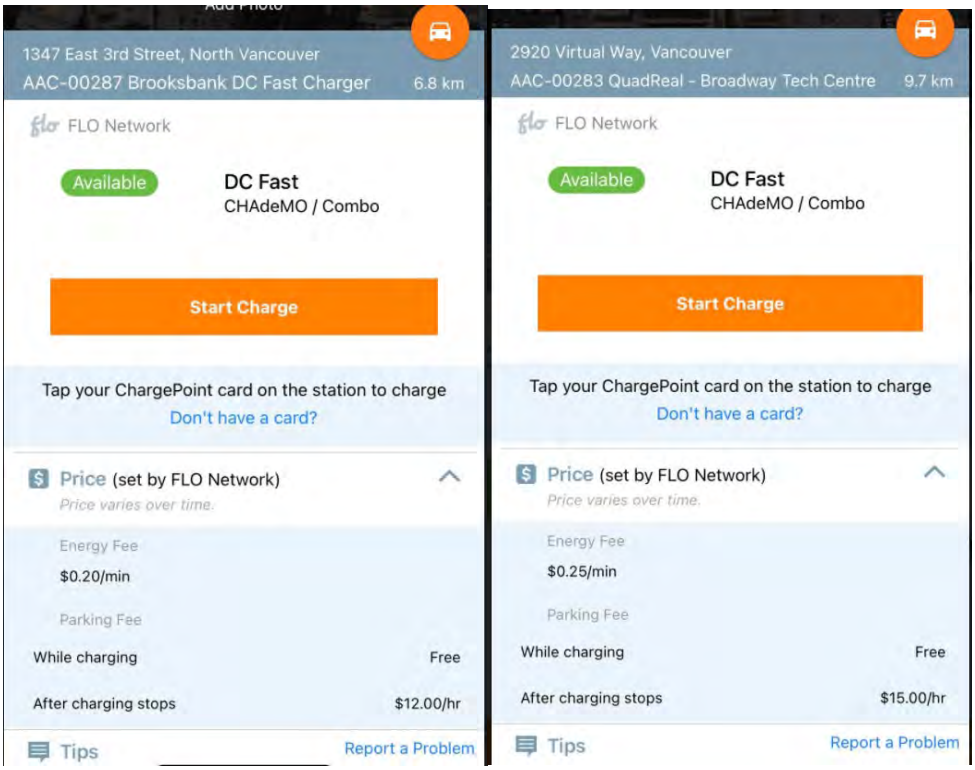

1.18.6 Please discuss how BC Hydro plans to prevent EV drivers to remain connected to the station and/or parked in the EV charging stall after the charging session has stopped.

1.18.6.1 If this were to occur, please discuss the potential impact on the utilization rate of the charging stations and, in turn, on the full cost of service.

RESPONSE:

As explained in BC Hydro's response to BCUC IR 1.18.4, BC Hydro does not currently plan on charging an idle fee to customers who continue to occupy a charging station once the charging session is completed. For technical reasons we are unable to implement such a design at this time.

Please refer to BC Hydro's response to BCUC IR 1.18.3 where BC Hydro states that the idle fees could dissuade users of a fast charging station from occupying the station longer than necessary, thereby potentially as a means to maximize availability of fast charging stations for all users. Thus, if an idle fee were to be set, it could increase station utilization. However, we do not have sufficient information to provide a quantitative estimate any resulting increase in utilization or cost recovery.

BC Hydro notes that an idle fee could reduce overall customer satisfaction.

18.0 C. RATE DESIGN

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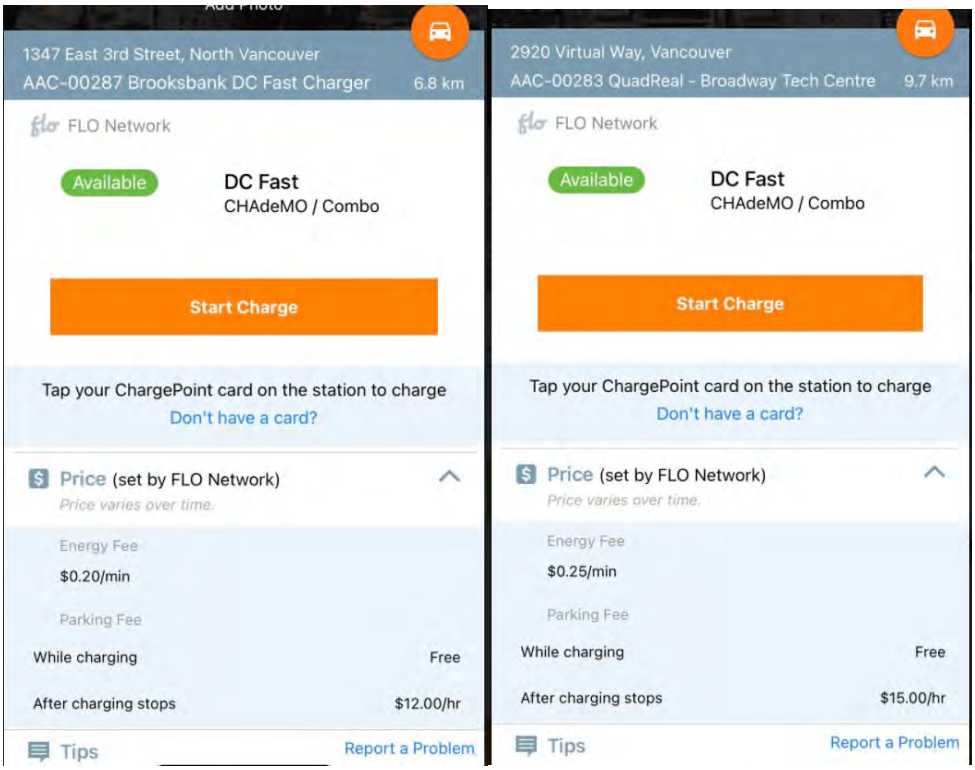

1.18.7 If BC Hydro was directed to implement idle fees for cars who remain connected to the station once the charging is complete, please discuss how it would design this portion of the rate.

RESPONSE:

BC Hydro is unable to design and implement an idle fee as it is not currently technically feasible to charge an idle fee or have a grace period in BC Hydro's EV network billing platform that was developed by AddEnergie Technologies. The charging session "clock" stops when either the vehicle reaches 100 per cent or when the customer presses the stop button on the charging station.

BC Hydro does not have a technical feasibility assessment or a timeline of when this capability will be available.

18.0 C. RATE DESIGN

Reference: RATE DESIGN
Exhibit B-1, Section 3.1, p. 18, Section 4.4, p. 35; Tesla website, Supercharging section1; Electrify Canada website, Pricing section2
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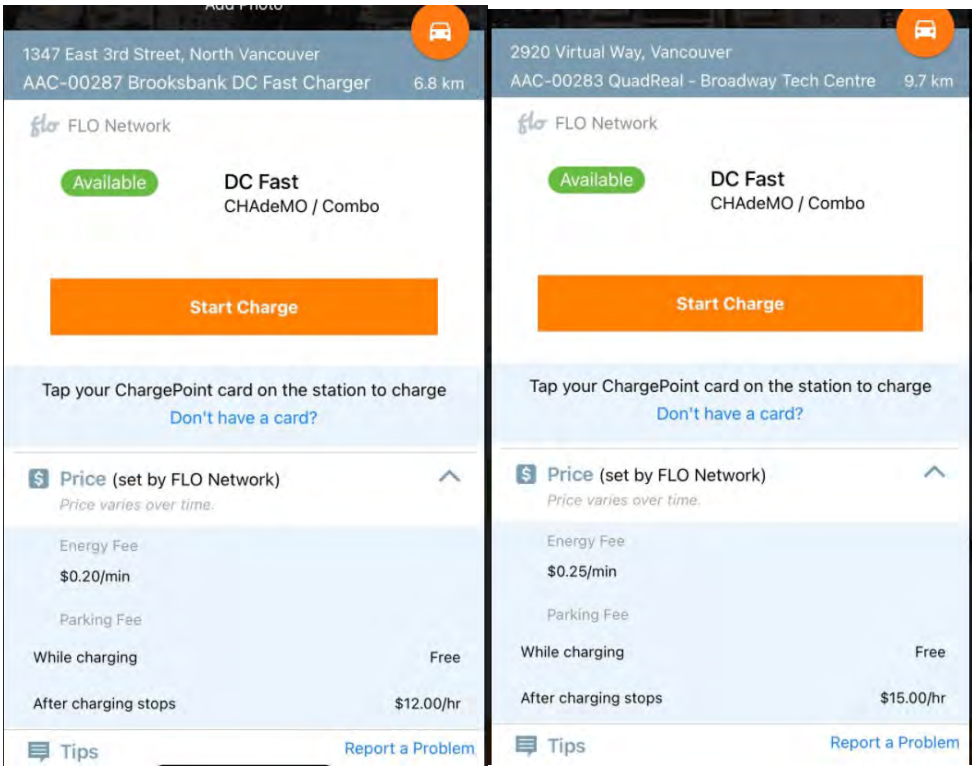

1.18.7 If BC Hydro was directed to implement idle fees for cars who remain connected to the station once the charging is complete, please discuss how it would design this portion of the rate.

1.18.7.1 Please confirm, or otherwise explain, that it would also be technically feasible for BC Hydro to implement idle fees at its charging stations.

RESPONSE:

Please refer to BC Hydro's response to BCUC IR 1.18.7.

18.0 C. RATE DESIGN

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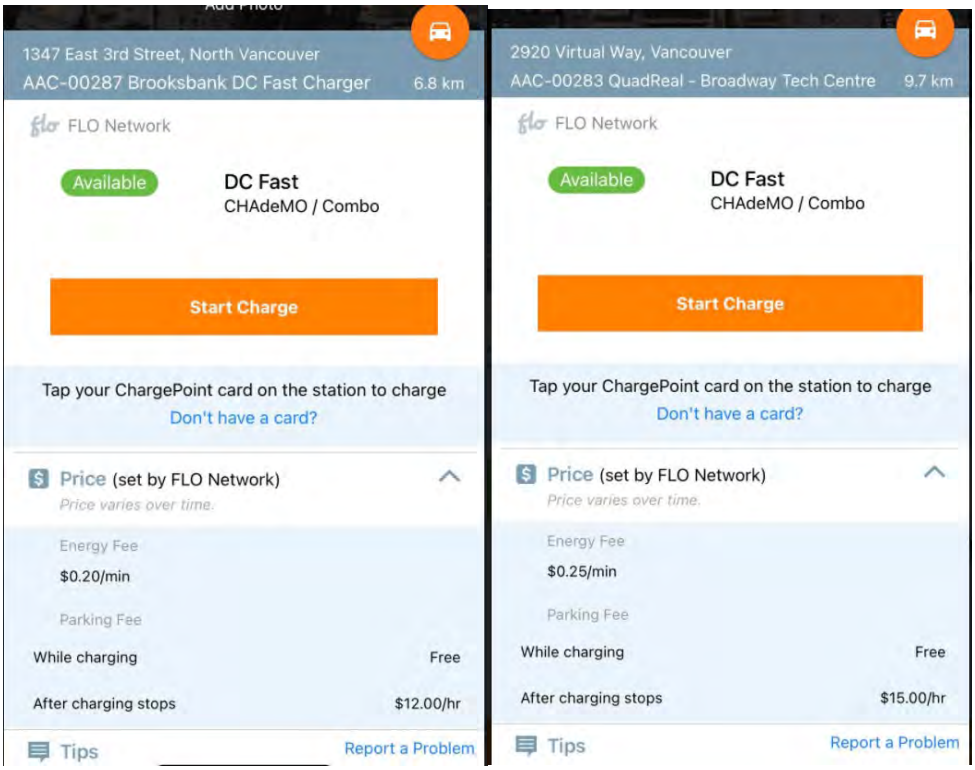

1.18.7 If BC Hydro was directed to implement idle fees for cars who remain connected to the station once the charging is complete, please discuss how it would design this portion of the rate.

1.18.7.2 Would it be costly to implement?

RESPONSE:

BC Hydro does not have a cost estimate for implementing an idle fee because, as explained in BC Hydro's response to BCUC IR 1.18.7, BC Hydro does not currently have technical capability to implement such fee and also does not have a timeline for the development of such capability.

18.0 C. RATE DESIGN

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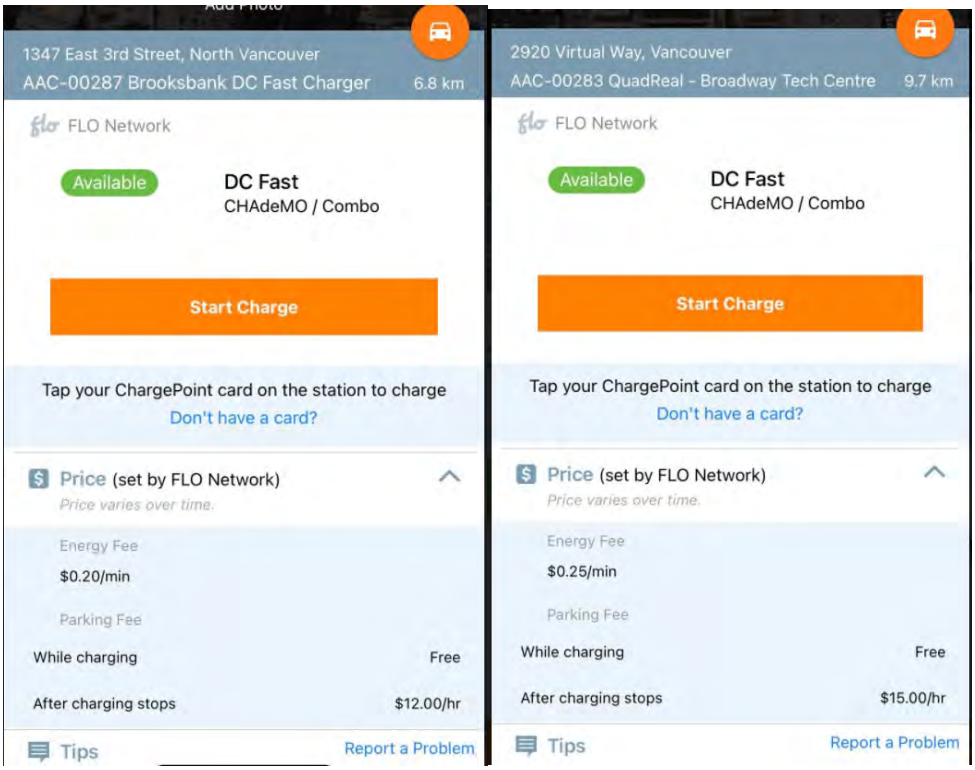

1.18.8 If BC Hydro were to implement idle fees, would it need to add a special condition in the rate schedules 1360, 1560 and 1561 to describe those idle fees? If not, how would BC Hydro provide information on idle fees to the EV fast charging stations customers?

RESPONSE:

As explained in BC Hydro's response to BCUC IR 1.18.7, BC Hydro does not currently have the technical capability to charge such a fee. As such we are unable to suggest what special conditions might apply to such a fee.

18.0 C. RATE DESIGN

Reference: RATE DESIGN
Exhibit B-1, Section 3.1, p. 18, Section 4.4, p. 35; Tesla website, Supercharging section[1]; Electrify Canada website, Pricing section[2]
Idle fees

On the Supercharging section of its website, Tesla describes idle fees:

> Idle fee
>
> **What are idle fees?**
> Idle fees apply to any car occupying a Supercharger if the station is at least 50% full and once the charge session is complete. If the car is moved within 5 minutes of the charge session completion, the fee is waived. To be clear, this is purely about increasing customer happiness and we hope to never make any money from it.
>
> **How long can I park at a Supercharger?**
> Once your vehicle has reached the range necessary to get to your next destination, please move your vehicle so other drivers can charge. Vehicles parked at a Supercharger beyond an active charge session will be subject to idle fees.
>
> Supercharger Idle Fee
>
> We designed the Supercharger network to enable a seamless, enjoyable road trip experience. Therefore, we understand that it can be frustrating to arrive at a station only to discover fully charged Tesla cars occupying spaces. To create a better experience for all owners, we're introducing a fleet-wide idle fee that aims to increase Supercharger availability.
>
> We envision a future where cars move themselves once fully charged, enhancing network efficiency and the customer experience even further. Until then, we ask that vehicles be moved from the Supercharger once fully charged. A customer would never leave a car parked by the pump at a gas station and the same thinking applies with Superchargers.
>
> The Tesla app allows owners to remotely monitor their vehicle, alerting them when their charge is nearly complete and again once fully charged. For every additional minute a car remains connected to the Supercharger, it will incur an idle fee. If the car is moved within 5 minutes, the fee is waived. Idle fees only apply when a Supercharger station is at 50% capacity or more. Idle fees double when the station is at 100% capacity. To be clear, this is purely about increasing customer happiness and we hope to never make any money from it.

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1 https://www.tesla.com/en_CA/support/supercharging#idle-fee [retrieved on April 16, 2021]
2 https://www.electrify-canada.ca/pricing/ [retrieved on April 16, 2021]

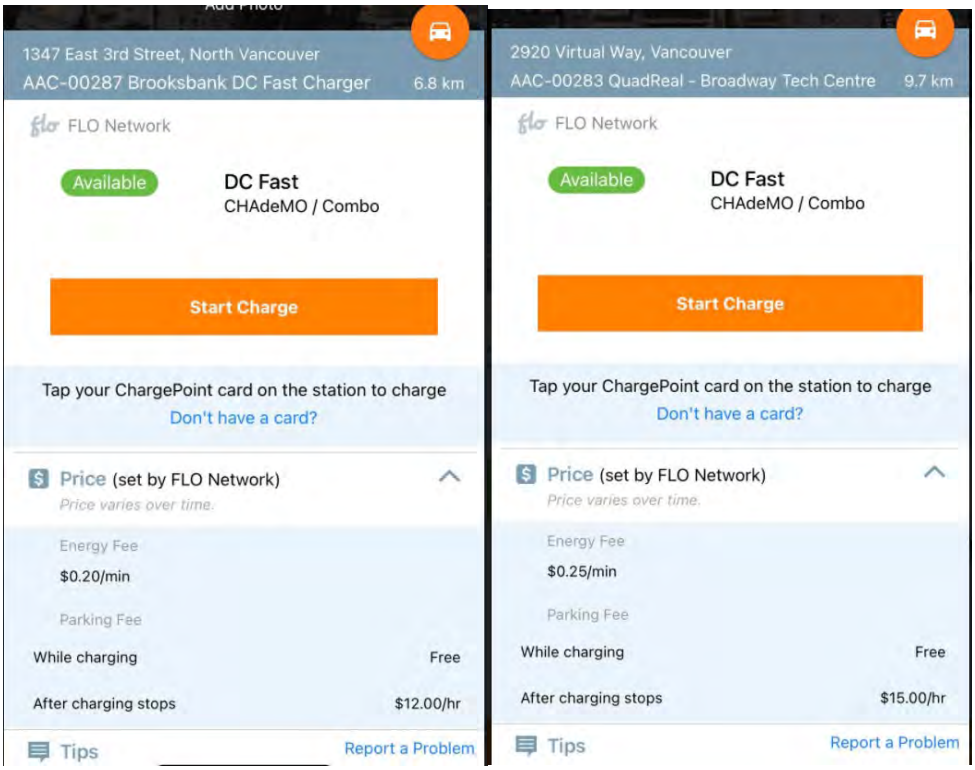
Idle Fees By Country

Country	Currency	Idle fee (per minute)	Idle fee (per minute) when the station is 100% occupied
United States	USD	$0.50	$1.00
Canada	CAD	$0.50	$1.00

On the Pricing section of its website, Electrify Canada described idle fees:

Idle Fee: Once charging stops, you pay $0.40/min. after a 10-minute grace period.

On the FLO Network, the following fees are shown for DC Fast Chargers, where an energy fee of either $0.20/min ($12.00/hour) or $0.25/min ($15.00/hour) is charged to the customer when the car is charging (while no parking fee is charged) and after charging, a parking fee set at the same level is charged.



1.18.9 Please describe, at a high level, the locations of the current 96 BC Hydro fast charging stations. For example, are they located in parking lot of malls, near tourist attractions, hotels, restaurants, where there may be increased likelihood of customers leaving their car parked at the charging station even after the session is complete? Or are they located at rest areas along the highway, where there may be increased likelihood of customers staying in their car while the car is charging and leaving the station immediately after the session is complete?

RESPONSE:

At a high-level, the sites for BC Hydro fast charging stations include:

- **Grocery store parking lots;**
- **Highway rest areas or visitor centres;**
- **Municipal parking lots (such as community centres or other municipal lots); and**
- **Urban curbsides.**

Where possible and practical, BC Hydro chooses locations based on the availability of nearby amenities. Signage at stations indicate a recommended time limit for charging. For instance, in the case of 50 kW charging stations, BC Hydro suggests a 40-minute time limit.

18.0 C. RATE DESIGN

Reference: RATE DESIGN
Exhibit B-1, Section 3.1, p. 18, Section 4.4, p. 35; Tesla website, Supercharging section1; Electrify Canada website, Pricing section2
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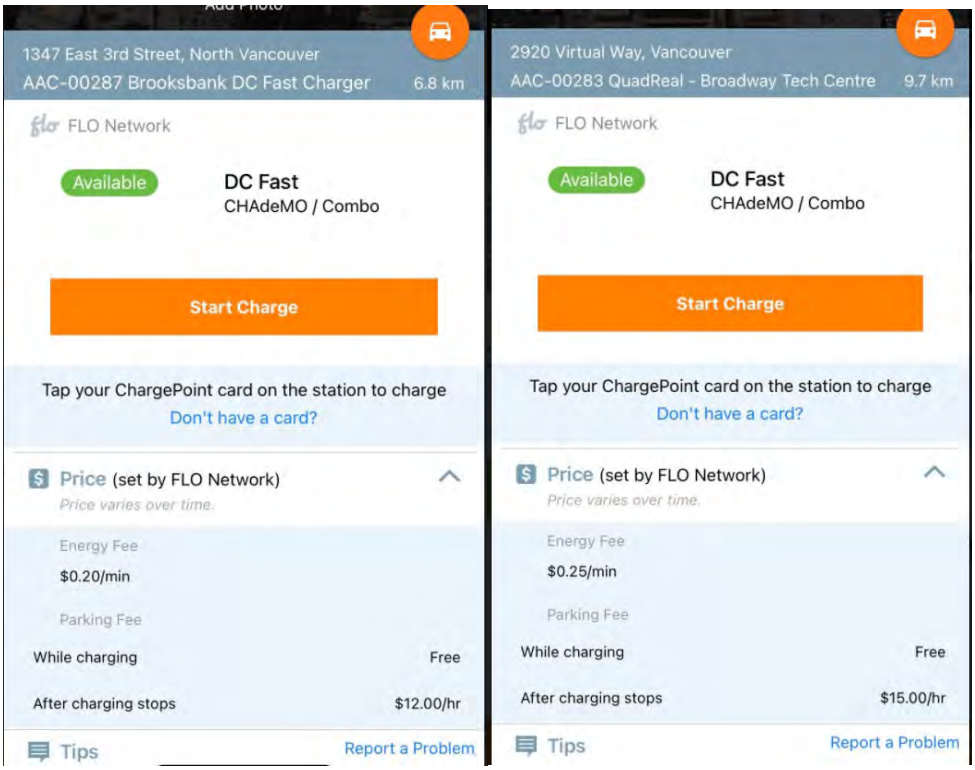

1.18.10 At the current sites, how many charging stations are installed and operational? If only one to two stations per site, please elaborate on what are BC Hydro's plans to install more than two stations at each site to reduce wait times.

RESPONSE:

As of April 26, 2021, BC Hydro has 93 public 50 kW charging stations and four public 25 kW charging stations located on 71 sites in operation.

For single charging station sites, BC Hydro plans to upgrade the majority of these sites over the next two year to dual fast charging station sites (subject to physical space and electrical capacity). All new sites going forward will have two or more fast charging stations.

To install more than two charging stations at each site, BC Hydro will assess the customer demand for expansion beyond two charging stations per site after the implementation of the interim rate that took effect on May 1, 2021, and will review the utilization of our busier stations at the end of the summer 2021 and update our workplan in the fall 2021, which may include consideration of expansion of sites to have more than two charging stations.

Please refer to BC Hydro's response to BCUC IR 1.16.5 where BC Hydro discusses the key consideration for supplying fast charging stations.

19.0 D. MONITORING AND EVALUATION

Reference: MONITORING AND EVALUATION
Exhibit B-1, Section 1.2, p. 4, Section 5, p. 36;
BC Hydro Fiscal 2022 Revenue Requirements Application, Exhibit B-4, BCUC IR 1.7.2 response
Data collection

On page 36, BC Hydro states that:

> We propose to file the evaluation report and, if warranted, an application to propose new rate(s) for fast charging service, by March 31, 2024. This timeline will allow for the collection and analysis of two full fiscal years of utilization and financial data (fiscal 2022 and fiscal 2023) as well as the completion of customer and stakeholder engagement informed by the results of the evaluation.

On page 4, BC Hydro states that:

> BC Hydro proposes to complete and file with the BCUC in fiscal 2024 an evaluation of RS 1360, RS 1560 and RS 1561 to inform whether any changes to the Proposed Rates should be made based on factors such as station utilization, customer and stakeholder feedback, industry developments, as well as potential developments to metering and billing technologies.

1.19.1 Considering that the cost recovery scenarios are highly dependent on many assumptions, such as utilization rate, average electricity usage per session and average length of charging session, amongst other variables, please discuss the pros and cons of filing the evaluation report a year earlier on March 31, 2023.

RESPONSE:

The reasons to adopt BC Hydro's proposed evaluation filing schedule of March 31, 2024 for the Proposed Rates as filed are as described below.

This timeline will allow for the collection and analysis of two full years of cost of service-related data, which will improve the reliability of the results. If an early evaluation is 2023 as directed, it will have only one year of cost of service data covering fiscal 2022. Fiscal 2022 data will likely be impacted by a the COVID-19 pandemic that has substantially impacted driving habits and BC Hydro's electricity sales, which could reduce confidence in our ability to use the results of the analysis to inform future year pricing.

An evaluation in 2023 limits the scope to one year of cost of service analysis because this analysis requires a full year of data, and the final clean data set for a given fiscal year is not available until late summer. A full year of data is required to capture demand related costs, which are seasonal. The lag between the end of the fiscal year and the availability of the clean final data set is due to data cleaning and reconciliation of bills.

The proposed timeline also allows for increased penetration of electric vehicles which we expect to impact utilization. The additional year increases the likelihood of utilization data being robust enough to identify of trends that could inform repricing.

In addition, the proposed timeline considers the benefit of rate stability to fast charging customers and considers regulatory efficiency and the costs associated with conducting evaluations.

19.0 D. MONITORING AND EVALUATION

Reference: MONITORING AND EVALUATION
Exhibit B-1, Section 1.2, p. 4, Section 5, p. 36;
BC Hydro Fiscal 2022 Revenue Requirements Application, Exhibit B-4, BCUC IR 1.7.2 response
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1.19.2 Considering that BC Hydro has developed the proposed rates based in part on the one-year data it collected from April 1, 2019 to March 31, 2020, please confirm, or otherwise explain, that collecting data over fiscal 2022 would be sufficient for the purposes of analyzing utilization and financial data to support a new rates application, if warranted.

RESPONSE:

Please refer to BC Hydro's response to BCUC IR 1.19.1.

19.0 D. MONITORING AND EVALUATION

Reference: MONITORING AND EVALUATION
Exhibit B-1, Section 1.2, p. 4, Section 5, p. 36;
BC Hydro Fiscal 2022 Revenue Requirements Application, Exhibit B-4, BCUC IR 1.7.2 response
Data collection

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1.19.3 Considering the level of support from the public for kWh-based billing over time-based billing and the fact that Measurement Canada expects to allow, in the next 18 months, existing and new EV charging stations that meet established technical standards to charge based on kWh consumed, please discuss the pros and cons of switching to kWh-based billing as soon as it is technically feasible.

RESPONSE:

Please refer to BC Hydro's response to BCUC IR 1.5.15.

19.0 D. MONITORING AND EVALUATION

Reference: MONITORING AND EVALUATION
Exhibit B-1, Section 1.2, p. 4, Section 5, p. 36;
BC Hydro Fiscal 2022 Revenue Requirements Application, Exhibit B-4, BCUC IR 1.7.2 response
Data collection

In response to BCUC IR 1.7.2 of the BC Hydro Fiscal 2022 Revenue Requirements Application, with regard to BC Hydro's short-term, medium and long-term EV charging infrastructure build-out plans, BC Hydro provided the following:

- For the short-term (to mid-2023), BC Hydro's plan is to deploy the electric vehicle charging stations identified in Appendix C as "incomplete".[1]
- For the medium term (to December 31, 2025), BC Hydro will continue to work with the Ministry of Energy, Mines and Low Carbon Innovation to develop a deployment plan. BC Hydro will also work with the Ministry of Transportation and Infrastructure, FortisBC Inc. and other applicable parties when developing the plan.
- BC Hydro will develop a long-term deployment plan (beyond December 31, 2025), when more information becomes available on the electric vehicle environment (e.g., market dynamics and technology).

1.19.4 As part of BC Hydro's proposed monitoring and evaluation over the next two to three years, please discuss whether it would be appropriate for BC Hydro to provide an EV charging infrastructure deployment plan for BCUC review. If so, please indicate what contents would be expected in the deployment plan. If not, please explain why.

RESPONSE:

BC Hydro believes that the revenue requirements application is the most appropriate process to provide updates on station deployments and plans.

This is because deployment plans are subject to ongoing revision and adjustment in response to changes, such as the ongoing availability of third-party funding for stations, growth in EV ownership, station utilization (with approved rates), technological change, the availability of suitable leasehold properties, and the

[1] As shown in BC Hydro's response to BCUC IR 1.3.3. Attachment 1 in Exhibit B-4 of BC Hydro's F2022 RRA.

deployment of fast charging stations by other entities. Sites or station deployments may shift in and out of the annual plan rapidly based on changing conditions.

20.0 E. IMPLEMENTATION, STATION ACTIVATION AND PAYMENT

Reference: IMPLEMENTATION, STATION ACTIVATION AND PAYMENT
Exhibit B-1, Section 6, pp. 37–38
Station activation and use

BC Hydro describes four methods to activate BC Hydro's EV charging stations: 1) BC Hydro EV App; 2) a pre-purchased RFID card; 3) a QR code sticker; and 4) via the FLO or ChargePoint mobile apps.

1.20.1 Do FLO or ChargePoint charge a network management fee to BC Hydro to allow users to active BC Hydro's stations through their mobile apps? If so, how much is it and where does BC Hydro record this cost?

RESPONSE:

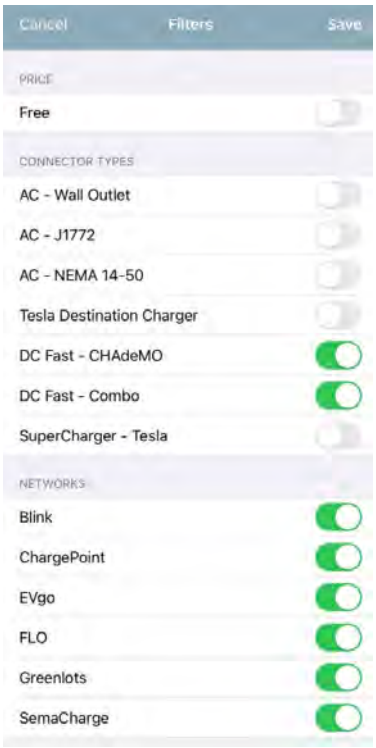
FLO or ChargePoint networks do not charge BC Hydro a separate network management fee to allow their users to activate BC Hydro's stations via roaming.

BC Hydro pays a consistent transaction fee to AddEnergie for all charging sessions on BC Hydro stations, regardless of the activation method (BC Hydro EV App, RFID card, QR code/one-time activation or roaming via the FLO or ChargePoint apps). These transaction fee costs are recorded in the Customer Service Key Business Unit.

20.0 E. IMPLEMENTATION, STATION ACTIVATION AND PAYMENT

Reference: IMPLEMENTATION, STATION ACTIVATION AND PAYMENT
Exhibit B-1, Section 6, pp. 37–38
Station activation and use

The following is a BCUC staff screenshot of the ChargePoint app taken on April 8, 2021 which shows the different networks available to be activated through the ChargePoint mobile app:



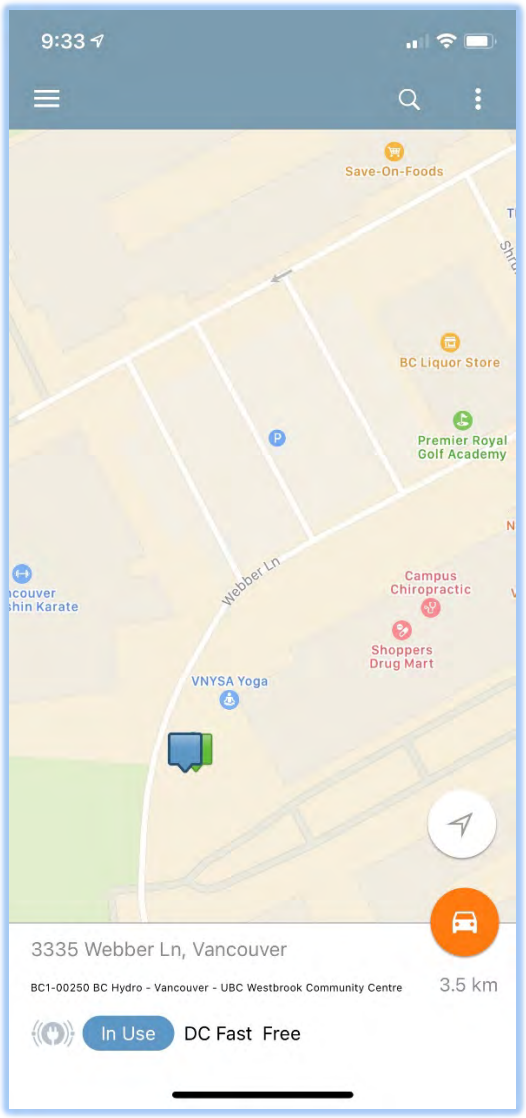
1.20.2 Please explain how a customer can activate a BC Hydro charging session through the ChargePoint mobile app when the BC Hydro network does not appear to be an available network on this app.

RESPONSE:

BC Hydro cannot speculate on app functionality decisions of its roaming partners. However, based on BC Hydro's review of ChargePoint app version 5.77, a user must be logged-in to the CharePoint app to view and activate BC Hydro stations as seen in the screenshot below. The network filter functionality does not seem to

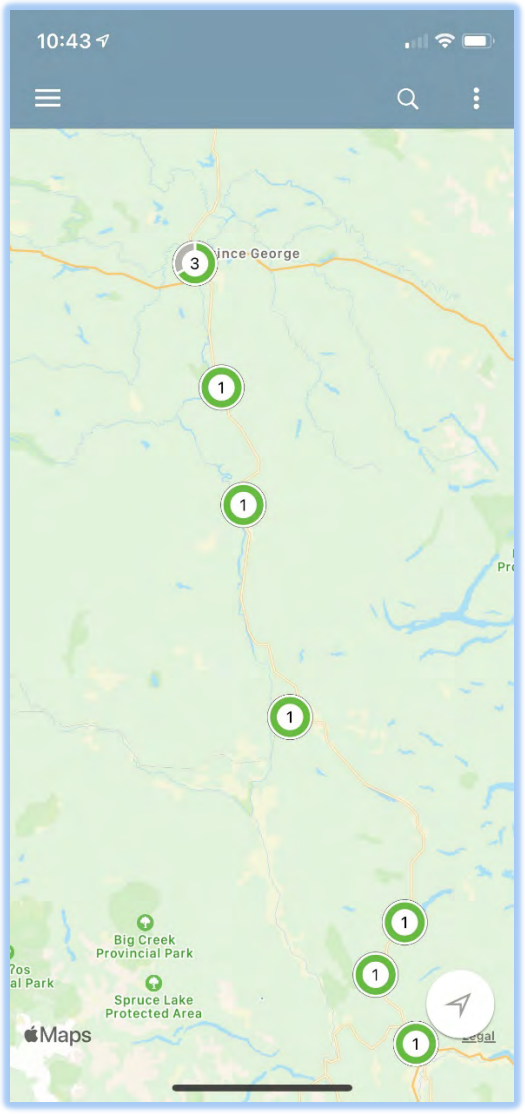
be working as turning off all the network filters seems to have no impact on which stations appear in the map.

The BC Hydro charging station at the UBC campus is shown in the ChargePoint app screenshot below. One charger is in-use (blue) and one charger is available (green).



The following screenshot of the ChargePoint app identifies the EV fast charging stations on Highway 97 between Cache Creek and Prince George. All of the

stations in this view are BC Hydro stations with the exception of one of three in Prince George.



20.0 E. IMPLEMENTATION, STATION ACTIVATION AND PAYMENT

Reference: IMPLEMENTATION, STATION ACTIVATION AND PAYMENT
Exhibit B-1, Section 6, pp. 37–38
Station activation and use

On page 38, BC Hydro states that "[t]he station will not activate if the balance is $0. The station users will be able to load their account by credit card using the "Add funds" option in the BC Hydro EV mobile app or website. A minimum of $10 needs to be loaded."

1.20.3 Please clarify whether the charging session would automatically stop if the account balance is drawn down to zero or if the charging session would continue, resulting in a negative account balance that the customer would need to pay before the next time if wants to use a station.

RESPONSE:

After the implementation of the rate as of May 1, 2021, customers could incur a negative account balance at the end of a charging session as long as they begin their session with a positive balance. That is, the customers must have a positive balance in their accounts before activating any charging session.

21.0 E. IMPLEMENTATION, STATION ACTIVATION AND PAYMENT

Reference: IMPLEMENTATION, STATION ACTIVATION AND PAYMENT
Exhibit B-1, Section 6, pp. 38–39
Billing and payment

On page 38, BC Hydro states that "[o]ptions one and two above (BC Hydro app and BC Hydro RFID card), are linked to a BC Hydro EV account to which funds can be preloaded by credit card. […] For option three, payment is by credit card".

On page 39, BC Hydro states that "[p]ayment for fast charging service must be made at the end of each charging session, and not on a billing cycle. In all cases payment is preauthorized prior to the charging session commencing, and payment is made in full when the charging session completes. Based on the method of station activation and payment, the station user may remain anonymous to BC Hydro".

1.21.1 Has BC Hydro considered allowing payment by credit card or debit card like at gas stations, i.e., allowing the customer to pay without the need to create an account via an app, buy a $15 RFID card or to use a QR code? What are the pros and cons of such payment method, would BC Hydro have to pay merchant fees, and if so, how much, and would BC Hydro be able to implement it? Please discuss.

RESPONSE:

Gas pumps at gas stations generally have physical credit card readers, and gas stations also usually have staff on-site for manual in-store activation if card readers fail.

BC Hydro has not pursued physical credit card readers for its fast charging stations as this would add additional cost and complexity.

Using the QR code on the station through a mobile phone to activate stations on a one-time basis with payment made by a credit card has been the most common approach for EV charging networks across North America. This method does not require a dedicated mobile application, network membership or a physical card reader.

21.0 E. IMPLEMENTATION, STATION ACTIVATION AND PAYMENT

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1.21.2 Has BC Hydro considered allowing payment by Apple Pay or Google Pay, i.e., allowing the customer to pay without the need to create an account via an app, buy a $15 RFID card or to use a QR code? What are the pros and cons of such payment method and would BC Hydro be able to implement it? Please discuss.

RESPONSE:

BC Hydro is considering Apply Pay and Google Pay options but does not have a definitive launch date for these capabilities.

Over time, BC Hydro will continue to explore additional payment and roaming options, such as software-based enhancements that do not require hardware changes. For each added method, there would be convenience provided, which needs to be balanced against potential implementation and operational costs.