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July 26, 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 to file copy of its opening presentation for the Streamlined Review Process (**SRP**) as Attachment 1.

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

Yours sincerely,



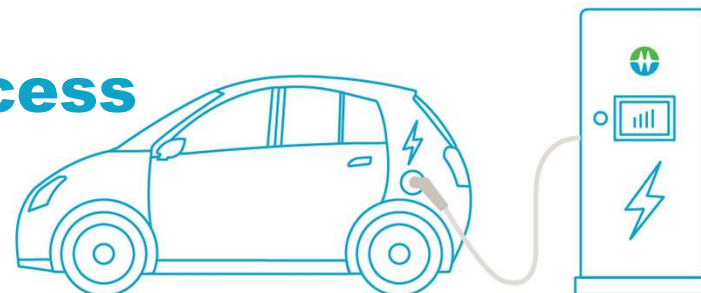
Chris Sandve
Chief Regulatory Officer

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BC Hydro Public Electric Vehicle Fast Charging Rates Application

Streamlined Review Process

BC Hydro, July 27, 2021



Approval Sought: Proposed Rates Schedules 1360, 1560 & 1561

- Full cost recovery is a long-term objective but is not possible over the near term
- As station utilization increases, revenue and cost recovery will also increase
- If rates are too high, utilization will drop, ultimately worsening revenue and cost recovery
- Ideally the Proposed Rates will maximize revenue collection from users of our public fast charging service, thereby reducing cross subsidization
- The rate design is subject to constraints:
 - Metering and billing systems do not yet support electricity-based designs
 - As this is a new service the rate design should be easy to understand and practical to administer
- There is uncertainty that cannot be resolved until we complete monitoring and evaluation:
 - Do the benefits of more sophisticated rate designs justify their additional cost and complexity?
 - Whether a different rate would better maximize revenue?
 - What is the fully allocated cost of service and is a new class of service justified?

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Customer and Stakeholder Research

- BC Hydro conducted extensive research and engagement with fast charging station customers and stakeholders to inform the Application
- Personal, in-depth interviews to test the survey questions – 9 interviews
- Public survey targeting BC Hydro Electric Vehicle Network members – 4,196 responses received
- Public workshop targeting stakeholders and organizations - 359 responses received to post-workshop survey

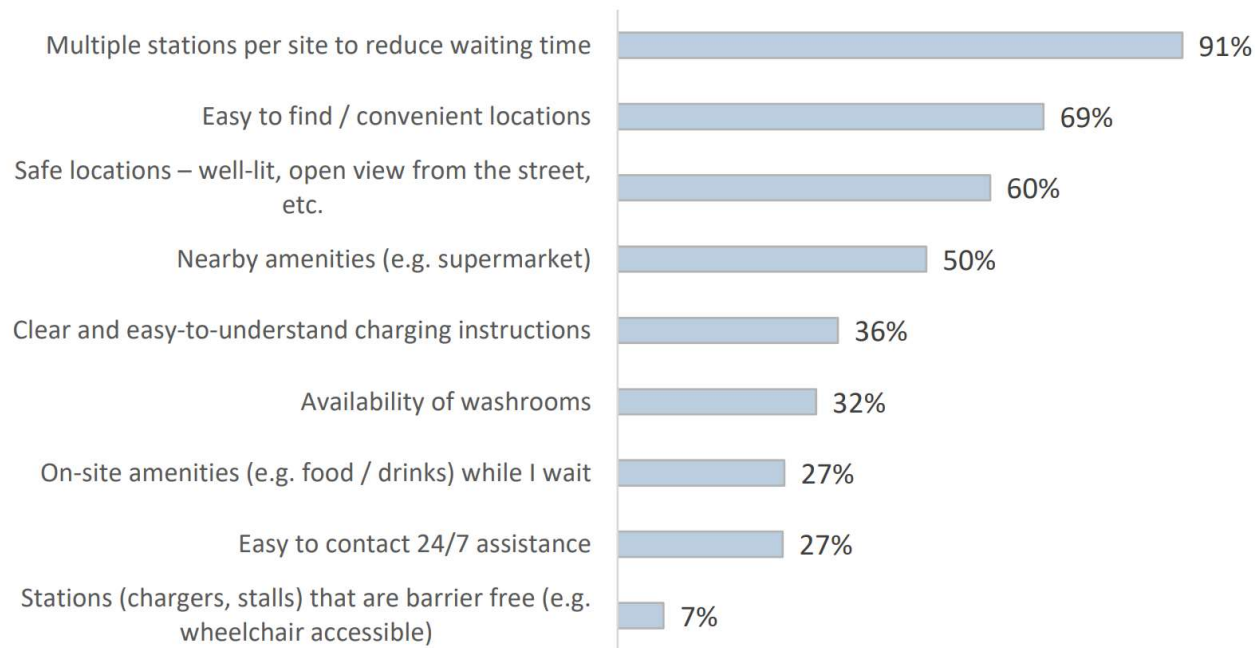


Survey Highlights

- **Support for introduction of a rate** – 59 per cent indicate it is reasonable to charge a rate for the use of a public fast charging station
- **Many Users Appear Price Sensitive** – 74 per cent indicate that being free to charge was a main reason for using the service, and 49 per cent said they would stop using the service when a rate is introduced
- **Preference for an energy-based rate design to a time-based rate design** – many respondents are concerned with fairness of time-based rate and would prefer an electricity-based rate design
- **Station users value amenities and services** - Survey respondents also valued attributes such as availability of washrooms, food and drinks, and lighting levels

Survey Highlights

Survey respondents were asked: “Which of the following attributes would you prioritize in the design of future BC Hydro fast charging stations?”



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Public Workshop Highlights


- **Preference for the rate to vary by station power level** – 73 per cent indicate that the rates should be different for different charger power station levels
- **Preference for the 50 kW station rate to be less than 25 cents/min** – 51 per cent of respondents indicated the rate should be less than 20 cents /min and another 38 per cent indicated it should be between 20 to 25 cents / min
- **Support for special conditions** – Support for BC Hydro to temporarily waive charges due to technical or network issues.



Jurisdiction Review Summary

Station Owner	Directly associated value-add station features & amenities	Charging Station Power Level	Rate Including GST (cents/min)
Ministry of Transportation	Restrooms at some locations	25 kW 50 kW	Free Free
Nanaimo Airport	N/A	50 kW	Free
City of North Vancouver	N/A	50 kW	20
City of Vancouver	N/A	50 kW	22-25.2
FortisBC Inc.	N/A	50 kW 100 kW	Proposed: 27.3 56.7
Electrify Canada	Ample lighting, quad stations, weather shelters being installed at all sites	Up to 350 kW CCS, up to 100 kW CHAdeMO	28.4 (<90 kW) 59.9 (>90 kW)
Suncor (Petro-Canada)	Ample lighting, on site retail, restrooms & on-site staff	Up to 200 kW or 350 kW CCS, up to 100 kW CHAdeMO	27
Tesla	Ample lighting, many sites have more than a dozen charging stations	72 kW, 150 kW and 250 kW	25 (<60 kW) 50 (>60 kW)

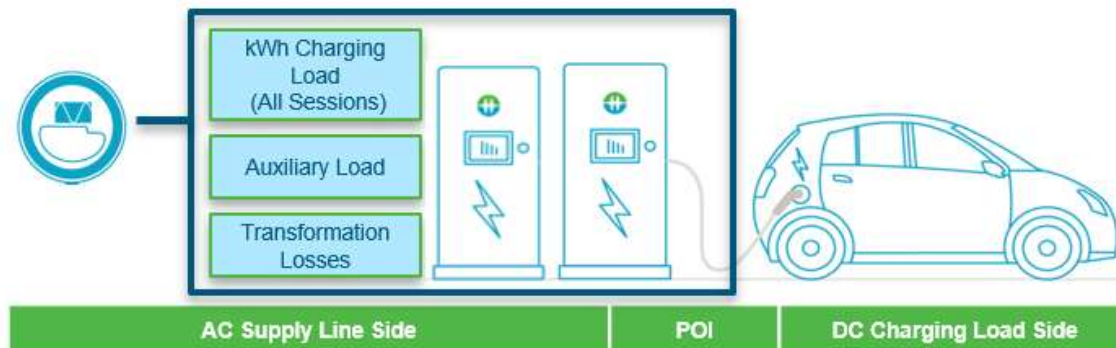
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Power smart

Metering Constraints – Current Status

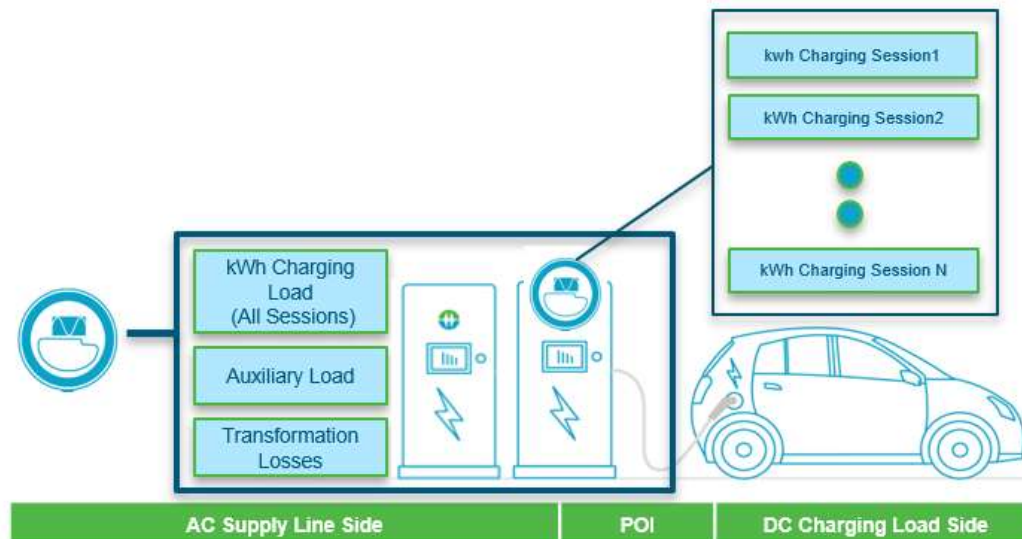
- Embedded DC Fast Charging Metering is not approved for electricity-based transactions
- Standard AC BC Hydro Revenue Meter measures the entire DC Fast charging site load
- BC Hydro metering system is not designed to perform bill reconciliation on a per-charging session basis, using the standard AC BC Hydro Revenue meter today.
- Because billing using AC Revenue meters is not practical, we have not estimated a time or cost to bill on this basis.



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Metering Constraints - Progress

- **DC Metering Standard now published** - in May 2021, the American National Standards Institute (ANSI) published a DC metering standard (ANSI C12.32) to establish acceptable performance criteria for revenue grade DC kWh energy and kW demand meters.
- **Measurement Canada is now actively working on developing a standard, based on ANSI C12.32, for DC Fast Charging station metering, with an expected date of approval in Q3/4-2022.**
- **BC Hydro is actively participating in the Measurement Canada consultation.**



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Rate Design Approach, 50 kW stations

- Calculate rates, in cents per minute, that would be required to recover different levels of electricity + maintenance + capital costs
- Identify a reasonable range for average utilization as being between 3 to 5 per cent
- Identify the rate that would be required to recover at least electricity related costs at utilization rates between 3 to 5 per cent as being between 17 and 25 cents/minute
- Select the rate of 21 cents/min considering revenue maximization, customer and stakeholder feedback and a jurisdiction review of prices
- Many customer have a choice of where to charge, such as: at home, at work, at a BC Hydro public fast charging charging station, or at public charging station offered by other providers including some that are free
- At utilization levels between 3 to 5 per cent, the hypothetical rate that would recover electricity + maintenance + capital cost is so much higher than alternatives available to customers that implementing this rate would harm utilization and revenue collection.

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Rate Design Approach, 50 kW stations

Utilization Rate		Electricity Costs (RS 1500 Equivalent) (\$/min)	Full Cost of Service: Electricity + Maintenance + Capital Costs (\$/min)
(%)	Average Number of Charging Sessions per Station per Month		
3.0%	46	\$0.25	\$1.29
3.7%	57	\$0.21	\$1.06
5.0%	77	\$0.17	\$0.79

Proposed Rates

Rate Schedule	Availability	Rates
Public Electric Vehicle Fast Charging Rate Schedule 1360	Electric Vehicle Charging at a BC Hydro owned 25 kW Fast Charging Station	12 cents / minute
Public Electric Vehicle Fast Charging Rate Schedule 1560	Electric Vehicle Charging at a BC Hydro owned 50 kW Fast Charging Station	21 cents / minute
Public Electric Vehicle Fast Charging Rate Schedule 1561	Electric Vehicle Charging at a BC Hydro owned 100 kW Fast Charging Station	27 cents / minute

Metering and Billing

- **Metering** – by the minute
- **Activation** – customers activate a charging station with one of four methods
 - BC Hydro EV mobile app
 - BC Hydro EV RFID card
 - Roaming* FLO mobile app or FLO RFID card, ChargePoint mobile app
 - Anonymous one-time activation using online credit card authorization
- **Billing and payment** – after charging has completed or session has stopped
- **No linkage** – between a bill for fast charging service and a BC Hydro residential or commercial account

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**50kW
Fast Charging Station**

Need help? Call us at **1 866 338 3369**
ev.bchydro.com

ID: BC1-AB004

Getting ready
Choose an activation option

BC Hydro EV app



BC Hydro RFID card



QR code



Follow these tips

- Plug in car before starting charge
- Charger can charge only one car at a time
- Limit your charge to 40 minutes
- Use PlugShare to check-in/out

Other activation options



FLO
App or card



Chargepoint
App only



Greenlets
App only

BC120-095

Terms and Conditions

- BC Hydro's Electric Tariff is set by the BC Utilities Commission. It sets terms and conditions such as:
 - Protection of BC Hydro, and therefore customers, against liability
 - Protection of BC Hydro, and therefore customers, against the cost of damage or removal to equipment
 - Assurance that BC Hydro will comply with standards
- The Proposed Rates also set specific terms and conditions
 - Service is available to any member of the public to charge an electric vehicle
 - Customer makes payment in full at the end of each Charging Session
 - Back billing and rebilling is inapplicable; however, BC Hydro may waive payment in circumstances which are beyond the control of the Customer

Monitoring and Evaluation

- BC Hydro will file a public evaluation no later than March 2024
- The purpose of the evaluation is to inform a potential application to the BCUC to reprice or redesign the public electric vehicle fast charging rates to improve their performance

Examples of data to be collected and analysis to be conducted:

- Customer feedback data from surveys, interviews, review of any complaints received
- Station utilization and usage patterns from billing data
- Annual and hourly electricity data (energy, demand, load profiles) from revenue meters and charging stations
- Revenue data from billing records
- Cost data from our internal data bases and as approved through Revenue Requirements Applications
- Costs and timelines to respond to advancement such as new Measurement Canada standards
- Fully allocated costs of service analysis, including consideration of whether a new class of service is warranted

BC Hydro's Stations and our Plan

- BC Hydro's currently operates 97 stations at 71 sites across the province
- Objective is to ensure that primary and major secondary highways across BC Hydro's service territory are "electrified" to facilitate travel using an EV
 - Current plans are for an average of about 15 new sites 45 new stations per year
 - 325 stations across 145 sites by end of 2025
 - About two-thirds of new stations will be deployed on or near highway corridors with the remaining one-third in urban/suburban areas
- Any deployment of additional stations after 2025 is likely subject to Provincial government direction

