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March 11, 2021

Sent via email/eFile

BC HYDRO 2020 STREET LIGHTING RATE APPLICATION EXHIBIT A-6

Mr. Fred James
Chief Regulatory Officer
British Columbia Hydro and Power Authority
16th Floor – 333 Dunsmuir Street
Vancouver, BC V6B 5R3
bhydroregulatorygroup@bhydro.com

Re: British Columbia Hydro and Power Authority – 2020 Street Lighting Rate Application – Project No. 1599147 – Information Request No. 2

Dear Mr. James:

Further to your November 12, 2020 filing of the above-noted application, enclosed please find British Columbia Utilities Commission Information Request No. 2. In accordance with the regulatory timetable, please file your response by **Thursday, April 1, 2021.**

Sincerely,

Original signed by:

Patrick Wruck
Commission Secretary

/ae



British Columbia Hydro and Power Authority
2020 Street Lighting Rate Application

INFORMATION REQUEST NO. 2 TO BRITISH COLUMBIA HYDRO AND POWER AUTHORITY

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A. RATE SCHEDULE 1701

18.0 Reference: INTRODUCTION
Exhibit B-4, British Columbia Utilities Commission Information Request 1.1, 1.1.1
Proposed effective date

In response to British Columbia Utilities Commission (BCUC) Information Request (IR) 1.1, British Columbia Hydro and Power Authority (BC Hydro) states:

... a timely decision on [Rate Schedule] RS 1755 is requested as BC Hydro is facing the Federal [Poly-Chlorinated Biphenyls] PCB regulation deadline of December 31, 2025...

In response to BCUC IR 1.1.1, BC Hydro states:

There is however a potential impact on customer rates of delayed final approval of RS 1701 amendments beyond May 1, 2021. This impact is specific to the supplemental charge. As described in section 5.2.2 of the Application, BC Hydro must recover the remaining book value of the replaced streetlights by the end of the Replacement Program, which is expected to be by March 31, 2024. The net book value is \$6.55 million. The proposed supplemental charge is calculated based on recovery of the undepreciated value of the existing street lights over the 35 months from May 1, 2021 through March 31, 2024. All else being equal, a delay in approval of the supplemental change could reduce the number of months over which the \$6.55 million would need to be recovered, and hence could increase the amount of the supplemental charge that would need be recovered per month per light.

18.1 Please explain the significance of the March 31, 2024 end date for the recovery of the undepreciated value of the existing street lights.

18.2 Please explain why BC Hydro is only proposing to recover the undepreciated value of the existing street lights over a 35 month period and not by (i) December 31, 2025, in line with the Federal PCB regulation deadline; or (ii) any other period.

18.2.1 Please discuss if the end date for recovery of the undepreciated value of the existing street lights can be extended. If yes, please explain why a later date was not chosen.

**19.0 Reference: BACKGROUND AND NEED FOR RS 1701 CHANGES
Exhibit B-1, Application, Section 3.5, pp. 16–17; Exhibit B-4, BCUC IR 3.6, 3.8;
Exhibit B-5, Zone II Ratepayers Group IR 4.1
LED Pilot Studies and Maintenance**

On page 16 and 17 of BC Hydro’s 2020 Street Lighting Rate Application (Application), it states:

...BC Hydro undertook two pilot studies to better understand these issues, inform LED purchase specifications, and to help inform customers in their selection of appropriate street lights for each location.

In 2016 and 2017, BC Hydro installed 195 LED street lights as part of its LED pilot studies. These pilot studies were conducted in the municipality of Richmond and in Haida Gwaii (Port Clements, Queen Charlotte City, Village of Masset, Skidegate).

In response to Zone II Ratepayers Group (Zone II RPG) IR 4.1, BC Hydro states:

While BC Hydro would have liked to conduct another pilot in the Northern Interior, the program focus changed after the Richmond and Haida Gwaii pilots towards vendor procurement activities and reviewing possible solutions with adaptive controls.

Instead of a third pilot in the Northern Interior, BC Hydro contacted other utilities that had installations in very extreme weather conditions. We are confident that the street lights will perform satisfactorily in these locations.

19.1 Please explain why the program focus shifted towards vendor procurement activities and reviewing possible solutions with adaptive controls upon completing the Richmond and Haida Gwaii pilot studies.

19.2 Please explain why BC Hydro did not perform an LED pilot study in the Northern Interior to test the suitability of LED lighting in extreme weather conditions.

19.2.1 Please provide a list of the utilities BC Hydro contacted in lieu of conducting a third LED pilot study. In your response, please provide (i) the location of LED street lighting exposed to comparable extreme weather conditions; and (ii) a summary of the information these utilities provided with respect to LED performance.

19.2.1.1 Please discuss how this information allowed BC Hydro to conclude that its procured street lights would perform satisfactorily in extreme winter conditions.

In response to BCUC IR 3.6, BC Hydro states:

BC Hydro agrees that these LED street lights can be repaired. However, in the event of a failed LED street light, BC Hydro plans to replace the entire street light luminaire and/or photocell on site and return the failed unit(s) back to the street light vendor for repair or replacement during the first 10 years of LED street light ownership.

Several factors were considered in making this decision including:

- BC Hydro has negotiated a 10-year repair or replacement warranty with our street light vendor for both the luminaires and photocells;

[...]

- Given the vastly lower volumes of failures and LED street lighting repairs not representing typical day-to-day work for these crews, BC Hydro believes the extra costs of stocking LED street light components at several line offices and keeping crews trained to troubleshoot the LED units across the province are greater than the cost to return the units to the vendor for repairs or replacements in the first 10 years of ownership. However, BC Hydro has not performed a detailed cost comparison analysis between these maintenance approaches; and
- Beyond the warranty period, BC Hydro may consider other repair or replacement options which also factor in the remaining life of the units as well as the availability of new technologies at that time which may be lower cost, more energy efficient, and more reliable.

In response to BCUC IR 3.8, BC Hydro states:

A similar maintenance approach will be taken with LED street lights. As units fail, the luminaire and/or the photocell will be replaced when failures are reported to BC Hydro by its customers. The number of reported failures for LED street lights is estimated to be about 15 per cent of those reported for HPS and MV street lights. Given the much reduced frequency of failures expected with LED street lights, BC Hydro has factored into the lifecycle maintenance costs a proactive group luminaire cleaning at year 10 of ownership to ensure light output is maintained at acceptable levels throughout the 20-year life of the luminaires.

- 19.3 Please confirm, or explain otherwise, if the repair or replacement warranty period for a failed LED street light begins upon street lighting installation.
- 19.4 Please discuss other repair or replacement warranties that were considered and why BC Hydro selected a 10-year warranty period.
- 19.4.1 Please indicate whether the negotiated warranty is set at a reduced rate per street light or at a fixed cost per year.
- 19.4.2 Please confirm, or otherwise explain, that BC Hydro does not intend to stock any LED units or components at its local line offices.
- 19.4.3 Please indicate the estimated lead time for BC Hydro's vendors to replace a failed LED street light. In your response, please discuss the logistics of where the repair and/or replacement is sourced and how long a street light may be out of service until it is repaired and/or replaced.
- 19.4.4 Please indicate whether there are any incremental costs outside of the warranty when an LED street light fails. If yes, please provide an estimate of these incremental costs.
- 19.4.5 Please confirm, or explain otherwise, that BC Hydro has contracted with third party installation crews to assist with the RS 1701 deployment schedule.
- 19.4.5.1 If confirmed, please explain why BC Hydro contracted with a third party. In your response, please provide an estimate of the savings achieved using a third party instead of utilizing BC Hydro technicians.
- 19.5 Please provide forecast cost comparison analyses between the following two maintenance approaches:
- i. costs to stock LED street light components and retaining trained crews; and

- ii. costs to return LED units to the vendor for repair and replacement for the first 10 years of ownership.

19.5.1 Please provide a cost comparison for the selected 10-year warranty period, any other warranty periods considered and the in-house street light replacement.

19.6 Please discuss the potential repair or replacement options that may be available to BC Hydro beyond the 10-year warranty period.

19.6.1 Given LED street lights are expected to have a 20 year life, please explain why BC Hydro chose not to train and utilize in-house crews in order to service BC Hydro's LED street lights before and after the 10-year warranty period.

19.6.2 Please confirm if BC Hydro intends to retain a minimum complement of trained crews across the province to service BC Hydro's LED street lights after the 10-year warranty period.

19.7 Please explain how BC Hydro estimated the failure rate of LED luminaires relative to HPS and MV street lights. In your response, please provide the projected number of failures for LED street lights each year and the anticipated timing of occurrence of such failures following completion of the Replacement Program.

**20.0 Reference: RS 1701 LED STREET LIGHT REPLACEMENT PROGRAM
Exhibit B-4, BCUC IR 4.3–4.6, 8.8; Exhibit B-5, Zone II RPG IR 6.1.1; BC Sustainable Energy Association IR 6.2
LED installation plan and procurement process**

In response to BCUC IR 4.3, BC Hydro states:

BC Hydro does not plan to introduce any additional wattages or colour temperature options to customers during the deployment of LED Street Light Replacement Program. BC Hydro has provided a selection of wattages and colour temperatures that we believe meet the needs of our customers. BC Hydro did not receive significant feedback in this regard during the customer consultation sessions of the program.

However as new, more efficient, and more effective luminaire options become available and as customer demand changes, BC Hydro will consider adding or replacing wattages and colour temperatures after the completion of this program.

20.1 As more efficient and effective luminaire options become available, please explain how BC Hydro plans to offer additional wattage and colour temperature options to customers after completion of the Replacement Program. In your response, please discuss the potential changes, if any, to LED rates if additional wattages and colour temperatures are offered.

In response to BCUC IR 4.4, BC Hydro states:

Other than markets for scrap metal value, BC Hydro is not aware of secondary markets to sell its current inventory of street lights. If such a market were to exist, BC Hydro could only sell units that were confirmed to have no PCBs.

In response to BCUC IR 4.5, BC Hydro states:

Yes, BC Hydro considered the potential resale value. However, as explained in BC Hydro's response to BCUC IR 1.4.4, BC Hydro is not aware of secondary markets to sell its current inventory of street lights.

BC Hydro will recover scrap value by transferring ownership of non-PCB units and components to installation contractors for resale as part of the LED street light installation services contract prices for the majority of units removed.

In response to BC Sustainable Energy Association (BCSEA) IR 6.2, BC Hydro states:

BC Hydro confirms that there can be a range of PCB concentration amounts in these street lights and it can be in a concentration that exceeds 50 mg/kg. BC Hydro cannot determine the concentration of PCBs in a street light without destroying the fixture. As a result, BC Hydro has assumed all of the lights have PCB concentrations exceeding 50mg/kg such that the restriction on transfer and operation would apply.

- 20.2 Please provide the approximate scrap value that BC Hydro will recover from transferring ownership of non-PCB units and components to its installation contractors. In your response, please discuss what BC Hydro intends to do with the recovered scrap value.
- 20.3 Please discuss how other Canadian utilities, namely Manitoba Hydro, Hydro Québec, SaskPower and Nova Scotia Power, have taken into account the potential scrap values of their existing HPS/MV street lights with respect to LED rate design.
- 20.3.1 Please discuss how these Canadian utilities are managing their HPS/MV inventories upon removal from their respective street light networks.
- 20.3.2 Please compare the approach used by other Canadian utilities with BC Hydro's approach as it relates to managing their HPS/MV inventories upon removal from their respective street light networks.

In response to BCUC IRs 4.6 and 14.6.1, BC Hydro states:

BC Hydro does not anticipate light shields will be needed because LED street lighting has more defined cut off than do HPS lights. As installation of a light shield would be done after the initial deployment of LED lights, the main cost is the labour required for a second visit to the location. We will evaluate whether there is a need to offer light shields as we continue to roll out LED street lights and will determine whether a charge is warranted to recover the added costs in the future.

[...]

As stated in BC Hydro's response to BCUC IR 4.6, BC Hydro does not anticipate needing lights shields. That being said, BC Hydro will work with its customers on any specific lighting concerns. Based on discussions with other utilities and luminaire manufacturers, light shields are generally not required as LED luminaires have more defined lighting cut-off than HPS street lights. BC Hydro's installation crews will follow the instructions provided to minimize light spill into residential dwellings. Furthermore, BC Hydro will work with the customer on a one-off basis and may perform a site check, re-aim the luminaire, confirm the appropriate luminaire is installed. The resolution could also include moving the light to another pole and/or installing a shield (if required). *[emphasis added]*

- 20.4 Please provide a cost estimate to install an LED light shield, including labour costs. In your response, please explain how BC Hydro intends to recover these costs.
- 20.5 If the installed luminaire is deemed to be unsuitable, please discuss whether the customer or BC Hydro is responsible for the luminaire's undepreciated value upon removal.
- 20.5.1 Please explain how the recovery of the undepreciated value in this scenario differs from

how BC Hydro currently treats undepreciated values, if applicable.

In response to BCUC IR 8.8, BC Hydro states:

the actual deployment schedule will be adjusted to enable a cost-efficient roll-out considering the timing of BC Hydro receiving customer selections, geographical distribution of the street lights and field crews, field crew capacity, seasonality, etc.

In response to Zone II RPG IR 6.1.1., BC Hydro states:

Table 4 is a high level and preliminary deployment schedule based on the installation capacity of BC Hydro's installation service contractors and internal crew. The actual deployment schedule is still being finalized and will be adjusted over the course of the deployment period.

20.6 Please provide the anticipated date when BC Hydro plans to issue the final deployment schedule to all RS 1701 customers. In your response, please discuss how BC Hydro intends to notify all RS 1701 customers of its deployment schedule.

20.6.1 Please discuss the potential impacts to customers if any changes are required to the final deployment schedule. In your response, please include potential changes to LED rates and customer bill impacts, if any.

**21.0 Reference: RS 1701 LED STREET LIGHT REPLACEMENT PROGRAM
Exhibit B-5, British Columbia Old Age Pensioners' Organization et al. IR 6.1, 10.3
Proactive replacement model**

In response to British Columbia Old Age Pensioners' Organization et al. (BCOAPO) IR 6.1, BC Hydro provides Attachment 1, the Line Asset Planning Business Case for Expenditure Authorization Request: Streetlight Replacement Program's Implementation Phase (Business Case), supporting the proactive replacement model as the best alternative based on regulatory compliance, financial and reputational considerations.

On page 38 of the Business Case, BC Hydro provides a Structured Decision Making (SDM) table:

SDM Table

**Completed as part of the Program's Identification Phase – Feasibility Design Stage Business Case*

Point of Comparison	Better	Similar	Worse				
Objective	Criteria	Measure	Alt 1	Alt 2	Alt 3	Alt 4	Notes
			(Status quo) Reactive replacement of failed High Pressure Sodium (HPS) street lights with new bulbs or fixtures	Reactive Replacement of failed HPS street lights or HPS street lights contains PCBs in a concentration of 50 ppm or more with new HPS street lights (future)	Reactive Upgrade - Convert failed HPS street lights to LED street lights	Proactive Upgrade - mass conversion of all HPS street lights to LED street lights	
Technical							
Increase Operational Efficiency	Reduction in Annual Energy consumed by BCH owned lights	GW/hrs per year (reduced compared to F2019 base)	None	None	~40GW/hrs or more/year as it could allow customers to select lower wattage LED lights.	~40GW/hrs or more/year as it could allow customers to select lower wattage LED lights.	
	Reduction in street light failures	Estimated annual number of failures at steady state	13,000	14,000	2,000	2,000	
	Efficiently locate street lights in Geospatial Information System (GIS) e.g. for failure response, billing, customer service	Yes/No	No	No	Yes	Yes - will realize earlier depending on deployment duration	For Alt 3 & 4 - Yes if controllers with GPS functionality and a control application are implemented in these alternatives.
	More efficient deployment of streetlight replacement	Yes/No	n/a	No	No	Yes	
Financial							
Minimize One-Time Investment Costs	One-Time Investment Loaded Capital and Non-Capital Costs (including Installation Labour, Materials, Program and Deployment Costs)	\$M	\$0M	\$16M	\$82M	\$73M	Base model only. Does not include controller solution
Manage Annual Maintenance (OMA) Costs	Steady State Annual OMA Costs	\$M	\$2.8M	\$3.0M	\$0M	\$0M	For Alt 1 and 2, assume maintenance program will continue to be fully funded. Higher OMA cost in Alt 2 compared to Alt 1 because RS1755 MV street lights are replaced with HPS street lights to meet PCB compliance and HPS street lights have higher failure rate. \$0 OMA cost in Alt 3 and 4 because LED spot failure replacement would be capital cost.
Minimize Lifecycle Cost	22 Year Evaluation Period	\$M in PV	\$104M	\$109M	\$91M	\$86M	Base model only. Does not include controller solution
Improve Financial Accuracy	Improved billing accuracy to minimize over and under billing	Yes/No	No	No	Yes	Yes - could realize earlier depending on deployment duration	For Alt 3 & 4 - Yes if controllers with GPS functionality and a control application are implemented in these alternatives.

In response to BCOAPO IR 10.3, BC Hydro states:

The Maintenance Savings reported for each year in Table G-5 were determined by comparing the High Pressure Sodium (HPS) street light historical maintenance budget average with the LED street lights ongoing costs.

- 21.1 Please explain how BC Hydro calculated the values listed in the Financial section for all four alternatives included in the above SDM Table.
- 21.2 Please reconcile the difference between the “Minimize One-Time Investment Costs” objective found in the Alternative 4 (Proactive Upgrade) column (\$73M) and the “Requested Total Authorized” value (\$83.28M) stated on Table G-4 in Appendix G of the Application.
- 21.3 Please explain why “Manage Annual Maintenance (OMA) Costs” is \$nil for Alternative 4 in the above SDM Table given that there are expected ongoing LED street light costs which are explained in the calculation of maintenance savings.
- 21.4 Please explain why the “Minimize Lifecycle Cost” point of comparison is based on a 22-year evaluation period in the above SDM Table when the marginal cost analysis and proposed rate design for RS 1701 is based on a 20-year analysis.
 - 21.4.1 Please explain and provide the difference between a 22-year and 20-year analysis period for each of the four alternatives.
 - 21.4.2 Please explain what costs are included in the “Minimize Lifecycle Cost” point of comparison. To the extent that the amount for Alternative 4 has been updated since the preparation of the Business Case, please provide the current estimate for the “lifecycle” cost of Alternative 4.

B. RATE DESIGN

**22.0 Reference: PROPOSED RS 1701 RATE
Exhibit B-4, BCUC IR 6.1
Bonbright criteria**

In response to BCUC IR 6.1, BC Hydro explains that it generally assesses Bonbright criteria as being “Very Good, Good, Fair, or Poor.” BC Hydro also explains that the economic efficiency and stability criteria were assessed as being “good” and provides the specific reasons why the criteria were not assessed as “very good.” With respect to customer understanding and acceptance, BC Hydro states:

... [proposed RS 1701 rates] was assessed as only “fair” on customer understanding and acceptance because BC Hydro understands that customers were expecting a rate reduction as a result of the LED replacement program, which is not the case. In addition, customer feedback on the supplemental charge has not indicated strong customer acceptance...

- 22.1 Please elaborate on the reasons why the proposed RS 1701 rates were assessed as “fair” but not “poor” on the customer understanding and acceptance criteria.
- 22.2 Please explain the steps taken by BC Hydro to improve the assessment of the customer understanding and acceptance criteria.
- 22.3 In BC Hydro’s view, aside from customer reactions to pricing signals, what other factors should the BCUC consider with respect to customer understanding and acceptance? Please discuss.
- 22.4 Please explain why the proposed RS 1701 rates represent a reasonable balance of all Bonbright criteria given that there is a “fair” rating on the customer understanding and acceptance criteria.
- 22.5 Please explain BC Hydro’s view as to how much weight should be given to one Bonbright criterion over another (i.e. please rank the relative priority of the Bonbright criteria in BC Hydro’s assessment and explain the basis for such ranking)?

**23.0 Reference: PROPOSED RS 1701 RATE
Exhibit B-1, Appendix G, pp. 8–9; Exhibit B-4, BCUC IR 9.2, 8.5, 4.1, 4.5; Exhibit B-5,
BCOAPO IR 14.2; BCSEA IR 5.3; the Commercial Energy Consumers Association of
British Columbia IR 3.3; BC Hydro 2020–2021 Revenue Requirement Application,
Transcript Volume 13 Oral Hearing, p. 2502
Program costs**

On page 9 of the Appendix G to the Application, BC Hydro provides Table G-4 showing the breakdown of total Program Costs:

Table G-4 Total Program Costs (Inclusive of LED Installation for RS 1755, RS 1701, and Contingency)

Program Costs	Total Request Amount (\$ million)
Direct Deployment Costs (Materials + Installation)	
Labour	20.14
Materials	24.55
Indirect Program Costs	
Program Management	1.34
Deployment Management	3.21
Supporting Technology	2.24
Customer Engagement	0.83
Other (Change Management, Material Management, Procurement, Regulatory)	0.64
Dismantling	2.41
Total Program Costs before Loadings and Contingency	55.36
Contingency	7.55
Inflation	2.92
Capital Overhead	7.53
Program Expected Cost	73.36
Program Reserve (Loaded)	9.92
Requested Total Authorized	83.28

In response to BCUC IR 9.2, BC Hydro provides a working Pricing Model Excel spreadsheet as Attachment 1. BC Hydro states that the “PricingModel” Tab of the model performs the calculations and the results are linked to the “AppTables” and “AppxG” Tabs of the model. The “AppxG” includes the results as presented in Table G-6.

In Columns K to M of Excel Rows 20 to 35 in the "PricingModel" Tab, BC Hydro shows a breakdown of the “Total Replacement Program Count” cost inputs, where the individual “Total Cost (\$)” amounts sum to \$42,900,635 and the “Cost Per Unit (\$)” is calculated based on 89,182 lights (Cell L22).

In response to BCOAPO IR 14.2, BC Hydro states:

The \$83.28 million requested authorized amount in Table G-4 is the maximum amount for which BC Hydro sought and received authorization from its Board of Directors in accordance with the Replacement Program business case dated December 4, 2019... Total investment-related costs in Table G-6 are calculated in order to determine the amount of annual depreciation to be included in the rate calculation.

On page 8 of Appendix G to the Application, BC Hydro states:

The costs for the program as documented in the Implementation Phase business case includes the conversion of both RS 1701 and RS 1755 lights to LEDs... the authorized cost is \$83.3 million. Subsequent to the business case being approved a decision was made to terminate the RS 1755 service and to only convert the Group 2 lights to LEDs.

23.1 Please confirm, or explain otherwise, that the difference between the breakdown of Program Costs shown in Table G-4 and the amounts in Columns K to M of Excel Rows 20 to 35 in the “PricingModel” Tab is due to BC Hydro’s subsequent decision to “terminate RS 1755 service and to only convert the [RS 1755] Group 2 lights to LEDs.”

23.2 Please confirm, or explain otherwise, that the RS 1701 rates for which BC Hydro seeks BCUC approval are the rates which are determined (in part) on the program amounts in Columns K to M of Excel Rows 20 to 35 in the “PricingModel” Tab and not the amounts in Table G-4.

23.2.1 If confirmed, please provide the following:

- (a) The amounts in Columns K to M of Rows 20 to 35 in the “PricingModel” Tab in the same format as Table G-4;
- (b) Supporting analysis and calculation for “Direct Costs Contingency” of \$5,765,219 in the “PricingModel” Tab (Cell L28);
- (c) Supporting assumptions and calculation for “Inflation costs” of \$2,518,013 in the “PricingModel” Tab (Cell L31); and
- (d) Clarification for whether there are any reserve amounts in Columns K to M of Excel Rows 20 to 35, including the basis and amount of reserves, if applicable.

23.2.2 If not confirmed, please update the “PricingModel” Tab on the basis of the Program Costs in Table G-4, as well as updating the results linked to the “AppTables” and “AppxG” Tabs of the model.

23.3 Please explain why the number of lights used in the “Cost Per Unit(\$)” calculation in the “PricingModel” Tab is based on 89,182 lights (Cell L22) whereas the “Number of Fixtures” is 90,850 in Cell E20.

In response to BCUC IR 8.5, BC Hydro states, “Program Costs that would be considered fixed costs, if fixed costs are defined as costs that do not directly increase or decrease based upon the number of street lights, include...”

In response to BCUC IR 4.1, BC Hydro states:

For the conversion of street lights on RS 1701, BC Hydro has completed the procurement process for the supply of luminaires and photocells as well as for the required installation services... BC Hydro has commenced the installation and billing of LED street lights. Therefore, a delay in receiving the final rate approval will not have a cost or schedule impact on this portion of the Program.

23.4 In the same format as Table G-4, please identify the costs in the table which are firm costs (i.e., costs that will not change) for example, due to executed procurement contracts.

23.4.1 For the costs that are subject to change, please explain the cost drivers and nature of the uncertainty. Please also discuss this in relation to BC Hydro’s experience with other capital projects after executed procurement contracts are in place, as appropriate.

23.5 If applicable, please also provide a response to BCUC IRs 6.4 and 6.4.1 in respect of any table provided in response to BCUC IR 6.2.1 (a).

In response to BCSEA IR 5.3, BC Hydro states that it cannot predict the number of future RS 1701 removal requests. However, BC Hydro provides the following table showing the number of RS street lights removal requests received in calendar years 2018, 2019 and 2020:

Year Completed	Total
2018	236
2019	198
2020	351
Grand Total	820

BC Hydro further states:

We expect customers will take the opportunity to examine their current and future street lighting needs and encourage customers to remove street lights that are no longer needed. We expect to receive an increased number of removal requests, as well as additions and alterations, during the LED street light deployment period.

- 23.6 Please confirm whether BC Hydro assumes all street lights currently on RS 1701 will be converted to LED street lights in the proposed rate design and pricing model for RS 1701 .
- 23.6.1 If confirmed, please explain why this is an appropriate assumption given the availability of historical data related to RS 1701 removal requests.
- 23.6.2 If not confirmed, please explain the assumptions made as it relates to RS 1701 removal requests. Please indicate the net number of street lights that will be replaced as incorporated in the proposed rate design and pricing model for RS 1701.

In response to BCUC IR 4.5, BC Hydro states:

BC Hydro will recover scrap value by transferring ownership of non-PCB units and components to installation contractors for resale as part of the LED street light installation services contract prices for the majority of units removed. [*emphasis added*]

- 23.7 Please explain how the recovery of scrap value “as part of the LED street light installation services contract prices” is accounted for in the proposed rate design and pricing model for RS 1701.
- 23.7.1 If it is in the proposed model, please provide the scrap value recovery amount and explain any assumptions BC Hydro made with respect to scrap value amounts.
- 23.7.2 If it is not in the proposed model, please explain why not and provide a model which would be net of the recovered scrap value.

In response to Commercial Energy Consumer Association of British Columbia (CEC) IR 3.3, BC Hydro states:

BC Hydro’s RS 1701 street light service offers customers a variety of street lights to be installed on existing poles placed exclusively to support the BC Hydro distribution system equipment and conductors (as well as TELUS equipment and conductors in the case of jointly owned poles).

On page 2502 of the Transcript from the BC Hydro 2020-2021 Revenue Requirement Application (RRA) proceeding, BC Hydro stated that 80 percent of its distribution poles are jointly owned with TELUS and that any change in terms of the distribution budgets for vegetation management would entail a discussion with TELUS in terms of their ability to actually contribute to the budget.

- 23.8 Please discuss whether there are any BC Hydro owned street lights which also have TELUS attachments. If yes, please identify how many (number or percentage).
- 23.9 Please discuss whether BC Hydro has had any discussions with TELUS to contribute to any portion of the incremental cost of the LED street lights. If yes, please provide a summary of the discussions. If no, please explain why not.
- 23.9.1 Please explain whether there are any revenue offsets from TELUS (or any other party) reflected in BC Hydro’s revenue requirements. If yes, what portion is currently being allocated to the BC Hydro owned street lighting rate class and how is this reflected in the proposed rate design and pricing model for RS 1701? If it is not reflected in the proposed rate design and pricing model for RS 1701, please explain why not.

**24.0 Reference: PROPOSED RS 1701 RATE
Exhibit B-4, BCUC IR 9.2
Investment Related Costs: SLIM sustainment cost allocation**

In response to BCUC IR 9.2, BC Hydro provides a working Pricing Model Excel spreadsheet as Attachment 1. BC Hydro states that the “PricingModel” Tab of the model performs the calculations and the results are linked to the “AppTables” and “AppxG” Tabs of the model. The “AppxG” includes the results as presented in Table G-6.

Excel Row 45 of “PricingModel” Tab identifies that there is a “SLIM sustainment cost allocation” included in the proposed pricing of RS 1701.

24.1 Please explain the nature of the “SLIM sustainment cost allocation” and the source of the amount of \$39,438 in Cell E45.

**25.0 Reference: PROPOSED RS 1701 RATE
Exhibit B-4, BCUC IR 8.6, 8.7, 9.2; Exhibit B-1, Appendix G, p. 15
Electricity savings**

In response to BCUC IR 8.6, BC Hydro states that the estimated annual energy savings of 28 GWh/year is estimated as follows:

$$\begin{aligned}
 \text{Annual energy savings} &= \text{Energy Savings per Street Light} \times \text{number of the street lights} \times (1+\text{T\&D Loss Factor}) \\
 &= (\text{Wattage}_{\text{HPS}} - \text{Wattage}_{\text{LED}}) \times \text{HOU} \times 365 \times \text{the number of the street lightings} \times (1+\text{T\&D Loss Factor}) \\
 &= (159.2 \text{ w} - 90.7 \text{ w}) / 1000 \times 11.5 \text{ hour per day} \times 365 \text{ days} \times 90,850 \times (1+7 \text{ per cent}) \\
 &\approx 28 \text{ GWh}
 \end{aligned}$$

Where $\text{Wattage}_{\text{HPS}}$ denotes the weighted average of wattage per HPS street light, and it was estimated as 159.2 w per HPS street light;

$\text{Wattage}_{\text{LED}}$ denotes the weighted average of wattage per to be installed LED street light, and it was estimated as 90.7 w per LED street light;

HOU denotes the average hour of use per street light per day;

T&D loss factor denotes the transmission and distribution loss factor and was assumed to be 7 per cent for street lighting.

In response to BCUC IR 8.7, BC Hydro states, starting from F2025, the annual capacity savings is estimated to be 6.7 MW as shown below:

$$\begin{aligned}
 \text{Annual capacity savings} &= \text{capacity savings per street light} \times \text{the number of street lightings} \times (1 + \text{T\&D Loss Factor}) \\
 &= (\text{Wattage}_{\text{HPS}} - \text{Wattage}_{\text{LED}}) \times 90,850 \times (1+7 \text{ per cent}) \\
 &= (159.2\text{w} - 90.7\text{w}) / 1,000,000 \times 90,850 \times (1+7 \text{ per cent}) \\
 &\approx 6.7\text{MW}
 \end{aligned}$$

Where $\text{Wattage}_{\text{HPS}}$ denotes the weighted average of wattage per HPS street light, and it was estimated as 159.2 w per HPS street light;

$\text{Wattage}_{\text{LED}}$ denotes the weighted average of wattage per LED street light to be installed, and it was estimated as 90.7 w per LED street light;

T&D loss factor denotes the transmission and distribution loss factor and was assumed to be 7 per cent for street lighting.

In response to BCUC IR 9.2, BC Hydro provides a working Pricing Model Excel spreadsheet as Attachment 1. BC Hydro states that the “PricingModel” Tab of the model performs the calculations and the results are linked to the “AppTables” and “AppxG” Tabs of the model. The “AppxG” Tab includes the results as presented in Table G-6.

- 25.1 Please explain the basis for the following underlying assumptions in the annual energy savings and annual capacity savings (starting from F2025) calculations:
- (i) Estimated wattage average of wattage per HPS street light of 159.2w;
 - (ii) Estimated weighed average wattage per installed LED street light of 90.7w;
 - (iii) Average hour of use per street light per day of 11.5 hours per day (annual energy savings calculation only); and
 - (iv) T&D loss factor of seven percent.
- 25.2 Please confirm, or explain otherwise, that the estimated weighed average wattage per installed LED street light of 90.7w in response to BCUC IRs 8.6 and 8.7 corresponds to Column E, Excel Rows 15 and 57 in the “PricingModel” Tab of the Excel model.
- 25.2.1 If confirmed, please also confirm that the estimated annual energy savings and annual capacity savings would be reflected in Section VII (Excel Rows 77 to 85) of the “PricingModel” Tab via the comparison of the proposed “F21 Effective Rates” (Excel Row 84) to “F21 HPS Rates” (Excel Row 78) which is calculated in Excel Row 85.
- 25.2.1.1 If not confirmed, please explain where the estimated annual energy savings and annual capacity savings are reflected in the Pricing Model Excel spreadsheet.
- 25.3 For Line 11 in Table G-6, Electricity Rate, BC Hydro provides a reference from its F2019 Fully Allocated Cost of Service (FACOS). Please provide the reference to the source data in which the derivation of the electricity rate of \$0.0398 per watt/month can be located in the F2019 FACOS.
- 25.4 Given that BC Hydro has used a marginal cost analysis in the Application, please discuss the significance/relevance of using the source data provided in the IR response above for the cost of electricity from the F2019 FACOS.
- 25.4.1 Please discuss why BC Hydro did not use a marginal cost of electricity for Line 11 for Table G-6 from Appendix G given that BC Hydro has prepared a marginal cost analysis in the Application.
- 25.4.2 If so directed, what would be a reasonable proxy for BC Hydro’s current marginal cost of electricity. Please discuss.

**26.0 Reference: PROPOSED RS 1701 RATE
Exhibit B-1, Appendix G, pp. 9, 12; Exhibit B-5, BCOAPO IR 11.1; Exhibit B-4, BCUC IR 9.2
Amortization of one-time investment replacement program costs**

In Table G-5 to Appendix G to the Application, BC Hydro provides the following amounts (in column 4) with respect to the amortization of one-time investment replacement program costs, where BCUC Staff note that the sum of the amounts in column 4 is \$58.3 million:

Table G-5 RS 1701 Marginal Cost Model Outcomes

Fiscal Year	Electricity Savings (\$ million)	Undepreciated Value of Existing HPS Lights (\$ million)	One-time Investment Replacement Program Cost (\$ million)	Maintenance Savings (\$ million)	Net Savings (\$ million)	Revenue without Replacement Program (\$ million)	Planned Revenue after Savings ⁴ (\$ million)
F2021	(0.1)	2.2	1.2	(0.5)	2.8	23.0	25.8
F2022	(0.6)	2.2	2.3	(1.3)	2.6	23.6	26.2
F2023	(1.3)	2.2	3.2	(1.3)	2.8	23.5	26.4
F2024	(1.7)	-	3.0	(1.3)	0.0	24.2	24.2
F2025	(1.9)	-	3.0	(1.3)	(0.2)	24.7	24.6
F2026	(1.9)	-	3.0	(1.4)	(0.2)	25.2	25.0
F2027	(1.9)	-	3.0	(1.4)	(0.3)	25.7	25.4
F2028	(2.0)	-	3.0	(1.4)	(0.4)	26.2	25.9
F2029	(2.1)	-	3.0	(1.4)	(0.5)	26.8	26.3
F2030	(2.1)	-	3.0	(1.5)	(0.6)	27.3	26.7
F2031	(2.3)	-	3.0	(0.8)	(0.1)	27.8	27.8
F2032	(2.5)	-	3.0	(0.2)	0.4	28.4	28.8
F2033	(2.5)	-	3.0	(0.3)	0.3	29.0	29.2
F2034	(2.6)	-	3.0	(1.4)	(0.9)	29.5	28.7
F2035	(2.6)	-	3.0	(1.4)	(1.0)	30.1	29.1
F2036	(2.7)	-	3.0	(1.4)	(1.1)	30.7	29.6
F2037	(2.8)	-	3.0	(1.4)	(1.2)	31.3	30.2
F2038	(3.6)	-	3.0	(1.4)	(1.9)	32.0	30.0
F2039	(3.7)	-	3.0	(1.4)	(2.0)	32.6	30.6
F2040	(3.9)	-	3.0	(1.3)	(2.2)	33.3	31.1

In response to BCOAPO IR 11.1, BC Hydro states that one-time replacement program capital costs are:

Amortization of Program capital costs attributable to LED streetlight deployment (depreciated over 20 years) and a small fraction of arm replacements (depreciated over 40 years). Capital costs include materials, installation labour, program management, deployment management, supporting technology, customer engagement, other support costs, as well as corresponding contingency, inflation and capital overhead; and...

Table G-4 to Appendix G to the Application shows that the “Requested Total Authorized” replacement program capital cost is \$83.28 million and the “Total Program Costs before Loadings and Contingencies” of \$55.36 million.

In response to BCUC IR 9.2, BC Hydro provides a working Pricing Model Excel spreadsheet as Attachment 1. In Columns K to M of Excel Rows 20 to 35 in the "PricingModel" Tab, BC Hydro shows a breakdown of the “Total Replacement Program Count” cost inputs, where the individual “Total Cost (\$)” amounts sum to \$42,900,635.

- 26.1 Please explain the difference between the sum of the amounts in column 4 of Table G-5 (i.e., \$58.3 million) and:
- (a) The “Requested Total Authorized” replacement program capital cost of \$83.28 million as provided in Table G-4;
 - (b) The “Total Program Costs before Loadings and Contingencies” replacement program capital cost of \$55.36 million as provided in Table G-4; and
 - (c) The “Total Replacement Program Count” cost inputs in Columns K to M of Excel Rows 20 to 35 in the "PricingModel" Tab of the Pricing Model Excel spreadsheet.
- 26.2 To the extent that any of the above differences are due, in whole or part, to the “small fraction of arm replacements” which are depreciated over 40 years instead of the 20-year analysis period of the program capital costs, please reconcile the impact of this factor to the overall difference and explain how BC Hydro determined the net book value of the applicable arm replacements.

27.0 Reference: PROPOSED RS 1701 RATE
Exhibit B-1, Section 5.2.1, pp. 27, 17, 22; Appendix G, pp. 2–3; Exhibit B-5, BCOAPO IR 6.1, 10.3; Exhibit B-4, BCUC IR 3.6, 3.7, 8.10, 9.2
Maintenance savings

On page 27 of the Application, BC Hydro states that the average value of estimated operational and maintenance savings is \$1.2 million since LEDs have a longer lifespan and lower failure rate compared to HPS light bulbs.

On page 8 of the Business Case, included in response to BCOAPO IR 6.1, BC Hydro states, “[w]hen comparing to steady state annual costs, annual OMA [operation and maintenance] Expenditure on Lighting Maintenance Programs will be reduced by an estimated \$2.7M on average.”

27.1 Please reconcile the difference in the estimated average maintenance savings as stated on page 27 of the Application and on page 8 of the Business Case.

In response to BCOAPO IR 10.3, BC Hydro states:

The Maintenance Savings reported for each year in Table G-5 were determined by comparing the High Pressure Sodium (HPS) street light historical maintenance budget average with the LED street lights ongoing costs. The LED street light ongoing costs include amortization of LED failure replacement, dismantling cost of failed LED street lights and allowance to clean all LED street lights after 10 years of ownership.

BC Hydro provides working Excel spreadsheets of the calculations included in Table G-3 and Table G-5 in response to BCUC IR 8.10. The worksheet titled “Input 6 (Maintenance Savings)” shows the following:

- Amortization of LED Spot Failure Replacement Costs: estimated annual cost increases steadily from \$0.1 million in F2032 to \$0.4 million in F2040. There are no estimated costs in F2021 to F2031.
- LED Spot Failure Replacement Dismantling Costs: estimated annual cost is \$0.1 million from F2034 to F2040. There are no estimated costs in F2021 to F2033.
- LED Street Light Washing Costs (OMA): the estimated annual cost is \$0.7 million in F0231, \$1.3 million F2032, \$1.2 million in F2033, and \$0.1 million F2034. There are no estimated costs in F2021 to F2030 and F2035 to F2040, respectively.

In response to BCUC IR 3.6, BC Hydro states, “BC Hydro has negotiated a 10-year repair or replacement warranty with our street light vendor for both the luminaires and photocells.”

In response to BCUC IR 3.7, BC Hydro states:

Table G-5 and Table G-6 of Appendix G both reflect the assumption that BC Hydro is returning all failed LED luminaires and photocells to the street light vendor in the first 10 years of ownership for repair or replacement at the vendor’s cost, and that BC Hydro is paying for the replacement of failed LED luminaires and photocells experienced on the system beyond 10 years. *[emphasis added]*

On page 17 of the Application, BC Hydro states that in 2016 and 2017, it installed 195 LED street lights as part of its LED pilot studies. BC Hydro states the purpose of the pilot included assessing the following:

- "LED performance compared to HPS luminaires"
- "Crew feedback regarding ease of installation, ease of cleaning the luminaire and replacing the components, build-up of dirt/ debris in the luminaire;" and
- "The number of luminaires that break, burn out or fail."

- 27.2 For clarity, please explain what is meant by “Amortization of LED Spot Failure Replacement Costs.” Is this related to the amortization cost of replacement LED street lights after LED street lights installed in the Replacement Program have failed?
- 27.3 Please explain why the expected timing for when the “Amortization of LED Spot Failure Replacement Costs” will begin (i.e., F2032) is two years before the expected timing for when “LED Spot Failure Replacement Dismantling Costs” will begin (i.e., F2034). In your response, please explain why the expected timing of these two costs does not coincide.
- 27.4 Please explain how BC Hydro estimated the annual cost of each LED street light ongoing cost (e.g., Amortization of LED Spot Failure Replacement Costs, LED Spot Failure Replacement Dismantling Costs and LED Street Light Washing Costs). In your response, please provide all assumptions and cost estimates, explaining considerations from the results of the 2016 and 2017 pilot studies, if any, for (i) the estimate of future failure rates from the time BC Hydro is responsible for the replacement of failed LED luminaires and photocells; (ii) the unit cost of dismantling (labour) and replacement (materials); and (iii) the estimated cost and schedule for luminaire cleaning.

On page 2 of Appendix G to the Application, Table G-1 shows the five-year average maintenance budget for existing RS 1701 street lights is \$1.25 million as follows:

Table G-1 Maintenance Budget for Existing RS 1701 Street Lights

Fiscal Years	Maintenance Budget (\$ million)
F2016	1.10
F2017	1.14
F2018	1.49
F2019	1.41
F2020	1.11
Five year average	1.25

On page 22 of the Application, BC Hydro provides the following table showing the preliminary installation schedule for LED street lights and the number of lights replaced per quarter:

Table 4 LED Street Lighting Installation Plan – number of street lights replaced per quarter

Region	Q3F21	Q4F21	Q1F22	Q2F22	Q3F22	Q4F22	Q1F23	Q2F23	Q3F23	Q4F23	Q1F24
Lower Mainland North	-	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200	750	-
Lower Mainland South	-	1,600	2,400	2,400	2,400	2,400	4,800	4,600	3,300	750	-
Vancouver Island	1,250	2,800	5,000	4,800	3,200	3,200	1,500	-	-	-	-
North Interior	400	550	-	-	-	-	2,900	4,400	3,000	3,200	3,150
South Interior	800	3,200	3,700	4,300	2,300	2,200	-	-	-	-	-
Total	2,450	9,350	12,300	12,700	9,100	9,000	10,400	10,200	7,500	4,700	3,150

In response to BCUC IR 8.10, BC Hydro provides working Excel spreadsheets of the calculations included in Table G-3 and Table G-5. Column E in the worksheet titled “Input 6 (Maintenance Savings)” shows the “Budget of HPS maintenance costs” for F2021 to F2040, which is compared to estimated LED street lights ongoing costs.

- 27.5 Please explain how the amounts in Column E in the worksheet titled “Input 6 (Maintenance Savings)” can be reconciled to the five-year average maintenance budget for existing RS 1701 street lights of \$1.25 million in Table G-1 and the preliminary installation schedule for LED street lights in Table 4.
- 27.5.1 Specifically, please explain how amounts during the installation period (i.e., in each year of F2021 to F2024) are estimated, including any inflation assumptions in those fiscal years.
- 27.6 Please explain why the maintenance budget for existing RS 1701 street lights in F2020 was less than the five-year average of \$1.25 million.

27.7 Please explain why the maintenance budgets for existing RS 1701 street lights in F2018 and F2019, respectively, were higher than the five-year average of \$1.25 million.

On pages 2 to 3 of Appendix G to the Application, BC Hydro claims that it examined valuing the maintenance savings using actual maintenance expenditures to maintain existing street lighting technology. BC Hydro states “[t]he concern with this approach arises because historic actual spend has been higher than budget due to unplanned re-lamping costs. BC Hydro does not view this situation as being sustainable, or its costs outcomes as being or suitable [sic] for use as an input to the rate design.”

27.8 Please elaborate on the concerns and implications with the approach of using actual maintenance expenditures.

In response to BCUC IR 9.2, BC Hydro provides a working Pricing Model Excel spreadsheet as Attachment 1. BC Hydro states that the “PricingModel” Tab of the model performs the calculations and the results are linked to the “AppTables” and “AppxG” Tabs of the model. The “AppxG” Tab includes the results as presented in Table G-6.

In Cell L49 of the “PricingModel” Tab, BC Hydro shows the total maintenance cost is \$10,883,870.

27.9 Please explain how the total maintenance cost in Cell L49 of the “PricingModel” Tab corresponds to the maintenance savings calculations provided in response to BCUC IR 8.10.

**28.0 Reference: PROPOSED RS 1701 RATE
Exhibit B-4, BCUC IR 9.2
Shared costs**

In response to BCUC IR 9.2, BC Hydro provides a working Pricing Model Excel spreadsheet as Attachment 1. BC Hydro states that the “PricingModel” Tab of the model performs the calculations and the results are linked to the “AppTables” and “AppxG” Tabs of the model. The “AppxG” Tab includes the results as presented in Table G-6.

In Excel Row 68 of the “PricingModel” Tab, BC Hydro provides the calculation “Shared Costs (customer etc.).”

28.1 Please explain the calculation in Excel Row 68, including the source data for the figures in the “Control Panel” for this calculation (which is shown in Columns K to M of Rows 67 to 71).

**29.0 Reference: Rate Design
Exhibit B-1, p. 2; Exhibit B-5, BCSEA IR 1.2, 1.4, 1.5, 1.6, 1.11; F2019 FACOS Study, p. 11; BC Hydro 2015 Rate Design Application, Section 1.1.3, pp. 1–4
Rate design principles and proposed changes**

On page 11 of the F2019 FACOS study, BC Hydro includes an F2019 Actual Revenue to Cost Ratio of 211.9% for the rate class called “Street Lighting, BC Hydro Owned.”

In response to BCSEA IR 1.4 and 1.5, BC Hydro states that it “acknowledges that the revenue received from RS 1701 exceeds the costs allocated to it in BC Hydro’s fully allocated cost of service studies.” However, BC Hydro “is not intended to change the revenue to cost ratio for the purpose of rate rebalancing.”

In response to BCSEA IR 1.6, BC Hydro also states that it:

...acknowledges that the revenue to cost ratio for the BC Hydro Owned Street Lighting Rate Class

indicates that BC Hydro collects more revenue from this rate class than our cost of service to them, as indicated by a revenue to cost ratio that exceeds unity. The revenue to cost ratio for the BC Hydro owned street light rate class has exceeded unity since this rate class was defined in 2016...

In the 2015 Rate Design Application, BC Hydro sought the division of its existing street lighting rate class into two new rate classes: customer-owned street lighting and BC Hydro Owned Street Lighting. This segmentation was approved by Order G-47-16 for the Negotiated Settlement Process.

- 29.1 Please provide the revenue to cost ratios for BC Hydro’s Street Lighting rate class prior to the segmentation in 2015.
- 29.2 Please provide the F2020 revenue to cost ratio for BC Hydro’s Street Lighting rate class, if available. If not available, please clarify when the F2020 FACOS Study will be available to be filed to the BCUC.
- 29.3 Please discuss the factors which have caused the revenue to cost ratio for BC Hydro Owned Street Lighting rate class to significantly exceed unity since 2016.

In response to BCSEA IR 1.2, BC Hydro provides a link to the F2019 FACOS Study. The following table is an excerpt from the BC Hydro F2019 FACOS Study at that link:¹

Rate Class	Revenue to Cost Ratios						Percentage of Energy at Customer Meter in F2019 (%)
	F2016 Forecast (%)	F2016 Actual (%)	F2017 Actual (%)	F2018 Actual (%)	F2019 Actual (%)	Percentage Point Change (F2018 Actual to F2019 Actual) (%)	
Residential	93.3	90.8	93.2	93.8	94.6	0.8	34.5
GS < 35 Kw	111.9	122.6	123.6	121.3	120.9	-0.4	7.7
MGS	117.2	123.5	115.1	114.3	115.1	0.8	6.7
LGS	101.3	103.9	103.9	102.9	102.4	-0.5	22.1
Irrigation	87.6	95.1	89.5	72.0	83.4	11.4	0.2
Street Lighting – BC Hydro Owned	173.6	183.6	198.4	210.5	211.9	1.4	0.1
Street Lighting – Customer Owned	104.8	101.8	95.1	92.8	88.4	-4.4	0.3
Transmission	102.6	98.8	95.4	96.1	94.9	-1.2	28.4
Total BC Hydro							100.0

- 29.4 Given that BC Hydro has stated that a revenue to cost ratio which exceeds unity means that BC Hydro has collected and/or is collecting more revenue from the “Street Lighting – BC Hydro Owned” rate class approved by Order G-47-16 than its cost of service, please confirm that for rate classes that are below unity, this means that BC Hydro is not collecting enough revenues from these rate classes to cover its cost of service.

- 29.4.1 If yes, please explain whether this equates to a level of cross-subsidization between rate classes (rate classes that are higher than 100 percent are subsidizing rate classes that

¹ <https://www.bchydro.com/content/dam/BCHydro/customer-portal/documents/corporate/regulatory-planning-documents/regulatory-filings/facos/00-2020-05-13-bchydro-facos-2019-annual-report.pdf>

are lower than 100 percent).

In response to BCSEA IR 1.6, BC Hydro states that “[a]djusting the revenue to cost ratio would require BC Hydro to file an application for rate rebalancing to the BCUC. Such an application would impact all ratepayers and goes beyond the scope of this street light rate application.”

29.5 Please clarify whether it is possible to adjust the revenue to cost ratio between the two streetlighting classes.

29.6 Please discuss the revenue to cost ratio threshold which would trigger BC Hydro to file a rate rebalancing application.

**30.0 Reference: PROPOSED RS 1701 RATE
Exhibit B-1, Section 5.2.2, pp. 28–29; Section 3.4, p. 16; Exhibit B-4, BCUC IR 5.2.1,
7.6.1; Exhibit B-5, BCSEA IR 1.4, 1.6. 1.7
Temporary supplemental charge alternatives**

On page 28 and 29 of the Application, BC Hydro estimates that a total of \$6.55 million would be unrecovered depreciation of the existing street lights that needs to be recovered through a supplemental charge. BC Hydro calculates the supplemental charge to be \$2.06/month/street light.

In response to BCUC IR 5.2.1, BC Hydro states:

If a RS 1701 street light is removed prior to its full depreciation, in most cases the undepreciated value is currently not recovered from the customer requesting the removal. These asset write-offs are forecast in BC Hydro’s revenue requirements and these forecast amounts are currently recovered from all ratepayers.

To the extent that total actual asset write-offs in a given fiscal year differs from the forecast amounts included in BC Hydro’s revenue requirements, these variances are not eligible for deferral to a regulatory account under existing orders; therefore, these variances are to the account of the shareholder.

[emphasis added]

In BCUC IR 7.6.1, the BCUC asks how utilities in other jurisdictions treat the unrecovered depreciation amount for street lights replaced as a result of the Federal PCB Regulation. In response, BC Hydro states it contacted SaskPower, Manitoba Hydro and Hydro Québec and found the following:

- SaskPower wrote off the undepreciated value which meant the cost was borne by the shareholder;
- Manitoba Hydro recorded the undepreciated value in a regulatory deferral account along with other annual asset retirement gains and losses. The cost was borne by ratepayers; and
- Hydro Quebec only replaces street lights when their lifetime is expired. There is no consideration of the undepreciated value of lights.

On page 16 of the Application, Table 3 shows that there are seven Canadian electricity utilities that are converting their street lights to LEDs: Manitoba Hydro, Hydro Québec, Newfoundland Power, Newfoundland & Labrador Hydro, SaskPower, Nova Scotia Power and New Brunswick Power.

30.1 Please confirm, or explain otherwise, that SaskPower, Manitoba Hydro and Hydro Québec are

Crown corporations owned by the provincial government of each respective province.

- 30.1.1 Was the treatment for unrecovered depreciation for street lights directed or mandated by the provincial government of each respective province? Please discuss.
- 30.2 Please explain why BC Hydro did not contact the other four Canadian electricity utilities noted in Table 3 (i.e., Newfoundland Power, Newfoundland & Labrador Hydro, Nova Scotia Power and New Brunswick Power) in responding to BCUC IR 7.6.1.
- 30.2.1 If possible, please provide a description of how these utilities treat the unrecovered depreciation amount for street lights replaced as a result of the Federal PCB Regulation.
- 30.3 If possible, please provide a description of how FortisBC Inc. treats the unrecovered depreciation amount for street lights replaced pursuant to BCUC Order G-102-18 dated June 4, 2018.
- 30.4 Please provide the forecast and actual amount in BC Hydro's revenue requirement related to the write-off of "RS 1701 street lights removed prior to its full depreciation" for the last five years.
- 30.5 Please discuss the pros and cons of BC Hydro adopting the methods of unrecovered depreciation amounts used by SaskPower, Manitoba Hydro and Hydro Québec. In your response, please discuss why BC Hydro would or would not be amenable to adopting each approach and provide the appropriate recovery period and carrying cost for BC Hydro in the case of the Manitoba Hydro approach.
- 30.5.1 Given that the undepreciated value of removed RS 1701 street lights is currently recovered from all ratepayers, please explain why BC Hydro now proposes to recover the undepreciated amount for street lights replaced from RS 1701 customers only.
- 30.5.2 Please explain the rationale for the current practice of recovering the undepreciated value of removed RS 1701 street lights from all ratepayers.
- 30.5.3 Please provide a calculation of the impact of recovering the estimated Net Book Value (NBV) of removed HPS street lights of \$6.55 million from all ratepayers through the current practice of asset write-offs.

In response to BCSEA IR 1.4, BC Hydro states, "BC Hydro acknowledges that the revenue received from RS 1701 exceeds the costs allocated to it in BC Hydro's fully allocated cost of service studies."

BC Hydro further states in response to BCUC IR 1.6:

BC Hydro acknowledges that the revenue to cost ratio for the BC Hydro Owned Street Lighting Rate Class indicates that BC Hydro collects more revenue from this rate class than our cost of service to them, as indicated by a revenue to cost ratio that exceeds unity. The revenue to cost ratio for the BC Hydro owned street light rate class has exceeded unity since this rate class was defined in 2016, and this situation is independent of the LED street light conversion program [emphasis added]

- 30.6 Given that the revenue to cost ratio for the BC Hydro owned street light rate class indicates that BC Hydro has collected more revenue from RS 1701 ratepayers than the cost to service them, has BC Hydro considered recovering the \$6.55 million from the shareholder and refunding that amount to RS 1701 ratepayers on account of the over-collection of RS 1701 revenue? Please explain why or why not.
- 30.6.1 Please discuss the implications of this hypothetical scenario.
- 30.7 Without filing an application for rate rebalancing for all rate classes, has BC Hydro considered

recovering the \$6.55 million from only those customer classes that are below unity. Why or why not?

- 30.7.1 Please discuss the implications (e.g., financial, operational, other) of this hypothetical scenario.
- 30.7.2 Please calculate the supplemental charge rider per month per street light, if the \$6.55 million unrecovered depreciation is to be charged to all other customer classes where the F2019 revenue to cost ratio is below unity.
- 30.8 Please provide a calculation of the supplemental charge rider per month per street light, if the \$6.55 million unrecovered depreciation was charged to the “Street Lighting – Customer Owned” rate class approved by Order G-47-16 instead.
 - 30.8.1 Please discuss the implications (e.g., financial, operational, other) of this hypothetical scenario.
- 30.9 Please discuss whether the hypothetical scenarios in the preceding questions equate to rate rebalancing. Why or why not?
- 30.10 To the extent possible, please provide an estimate of the total amount which has been over collected from RS 1701 as indicated by BC Hydro’s fully allocated cost of service studies.

In response to BCSEA IR 1.7, BC Hydro states:

The Bonbright principles do not apply only to marginal costs, and would normally be used to assess a proposed rate on an embedded cost basis. However, given that BC Hydro is not applying to rebalance its rates, and given section 58.1(7) of the Utilities Commission Act, it would not be appropriate to assess the proposed rates from an embedded cost basis in this proceeding.

- 30.11 Please clarify why it would not be appropriate to assess the proposed rates from an embedded cost, as it relates section 58.1(7) of the *Utilities Commission Act*.
- 30.12 Please discuss the implication of using embedded costs versus marginal costs. What is the directional impact to rates and why?

On page 29 of the Application, BC Hydro states:

Under International Financial Reporting Standards (IFRS),...the undepreciated value of the existing street lights that are removed before end-of-life must be recorded as an expense on BC Hydro’s income statement in the year the street light is replaced. BC Hydro is proposing that a monthly supplemental charge be applied in the fiscal years in which the Replacement Program is undertaken, to approximately align the recovery of the supplemental charge with the removal of the undepreciated assets from service.

...

BC Hydro calculates the supplemental charge to be \$2.06 /month /street light.

- 30.13 Please discuss whether the expensing rules under IFRS still apply if a deferral treatment is approved by the regulator for rate smoothing purposes.

31.0 Reference: PROPOSED RS 1701 RATE
Exhibit B-4, BCUC IR 5.2, 7.2; Exhibit B-5, CEC IR 4.1; BC Hydro Fiscal 2020-Fiscal 2021 RRA, Exhibit B-1, Section 8.2.2, p. 8-7
Temporary supplemental charge balance to be recovered

In response to BCUC IR 7.2, BC Hydro provides the following calculation of the \$6.55 million unrecovered depreciation:

Item		Amount (\$K)
Total undepreciated value of BC Hydro owned street lighting assets under RS 1701 as of November 1, 2020.	A	\$21,590
Proportion of undepreciated value attributable to the luminaire and a small fraction of arms portion of HPS assets to be replaced.	B	33.28%
Undepreciated value of HPS RS 1701 street lighting assets to be replaced under the Replacement Program as of November 1, 2020.	C = A x B	\$7,185
On-going depreciation of RS 1701 HPS street lighting assets to be replaced during the Replacement Program.	D	\$633
Total undepreciated value of BC Hydro owned street lighting assets to be replaced under RS 1701 as of the fiscal year-end of the date they are planned to be removed from service under the Replacement Program	E = C - D	\$6,552

In response to CEC IR 4.1, BC Hydro states:

There is no single remaining time period over which the street lights would have been fully depreciated because the street lights were originally installed or replaced at different times on a continual basis and have different vintages for depreciation purposes. Some HPS luminaires are nearly fully depreciated while some have been recently installed, for example to complete spot repairs in 2020, and these lights won't fully depreciate for up to 20 years.

On page 8-7 of the BC Hydro Fiscal 2020-Fiscal 2021 RRA, BC Hydro states:

BC Hydro-owned street light assets currently have high-pressure sodium (HPS) lights (luminaires). BC Hydro will be replacing the HPS luminaires with LED units in future years. Currently, the street lights (including the luminaires) are included in one asset class and the cost of replacing luminaries is expensed. The luminaire is essentially a light bulb which is low cost and has a short life. [*emphasis added*]

In response to BCUC IR 5.2, BC Hydro states that it uses a composite depreciation rate of 2.44 percent for all removed distribution equipment, including RS 1701 street lights, when a customer requests a new light fixture to replace an existing fixture.

- 31.1 Please clarify whether the cost of replacement HPS luminaires are capitalized as stated in response to CEC IR 4.1 or expensed as stated on page 8-7 of the BC Hydro Fiscal 2020-Fiscal 2021 RRA.
- 31.2 Please explain how BC Hydro estimated the ongoing depreciation of RS 1701 street lighting assets of \$633,000 in response to BCUC IR 7.2. For clarity, please confirm whether the composite depreciation rate of 2.44 percent noted in response to BCUC IR 5.2 is used or if some other rate is used.
 - 31.2.1 In a hypothetical scenario where no new assets are added to existing RS 1701 street lighting assets and the existing assets continue to be depreciated at current rate(s), how long would it take for existing assets to be fully depreciated?

- 31.3 Please clarify whether the current failure rate of HPS assets to be replaced has been taken into consideration in the calculation of the \$6.55 million unrecovered depreciation.
- 31.3.1 If not, please explain why this adjustment would not be appropriate.
- 31.3.2 If yes, please explain the adjustment.

**32.0 Reference: PROPOSED RS 1701 RATE
Exhibit B-1, pp. 1, 29; Appendix G, p. 17
Temporary supplemental charge amortization period**

On page 1 of the Application, BC Hydro states, “BC Hydro is required to remove or replace all equipment, including street lights, that contain Poly-Chlorinated Biphenyls (PCBs) by December 31, 2025 pursuant to the Federal PCB Regulation.” [emphasis added]

On page 17 of Appendix G to the Application, BC Hydro states that the supplemental charge is calculated to recover the undepreciated value of replaced street lighting equipment over the implementation period of the Replacement Program. This period is May 1, 2021 to March 31, 2024 (35 months) as stated on page 29 of the Application.

- 32.1 Please calculate the supplemental charge for RS 1701 under the scenario of amortizing the \$6.55 million unrecovered depreciation over each of four years, five years, six years, seven years, eight years, nine years and 10 years.
- 32.1.1 Please also provide the above calculation under the scenario of amortizing the \$6.55 million over the period May 1, 2021 to December 31, 2025.

**33.0 Reference: BILL IMPACTS
Exhibit B-4, BCUC IR 10.1
RS 1701 billing**

In response to BCUC IR 10.1, BC Hydro states:

Regarding customer awareness of potential bill impacts, BC Hydro sent an email to RS 1701 customers on December 7, 2020 advising them of the interim LED rates under RS 1701, which the BCUC approved on November 30, 2020. Once the final rates are approved by the BCUC, another email will be sent to customers advising of them of the details of the final rate and, if applicable, any adjustments related to the period for which they were charged the interim rates.

- 33.1 Please indicate what consultation occurred with customers regarding overall bill impact. Please indicate how this feedback impacted the final billing amount if at all.
- 33.2 Please indicate if any additional feedback was received from customers after the December 7, 2021 email. If yes, please provide a summary of the feedback received.

C. RATE SCHEDULE 1755

**34.0 Reference: AVAILABILITY AND APPLICABILITY
Exhibit B-4, BCUC IR 12.1, 12.3
RS 1755 Migration to RS 1701**

In response to BCUC IR 12.1, BC Hydro states:

Following the BCUC’s decision, BC Hydro will provide RS 1755 Group 2 customers with

information that includes:

- Details of the Commission’s decision
- Guidelines of the RS 1701 migration eligibility
- Timelines for RS 1755 termination and Group 2 migration to RS 1701
- Information regarding lighting options available for customers eligible for migration to RS 1701
- Support available for customers that wish to install their own outdoor lighting

In response to BCUC IR 12.3, BC Hydro states:

... 1755 Group 2 customers that do not have services suitable for transition to RS 1701 will need to provide their own lights and poles if they would like to continue to have the outdoor lighting at the current location. BC Hydro will then provide electrical service to the customer’s lights under the applicable rate schedule, in the same manner we would serve any existing customer installing lighting on their private property.

- 34.1 Please discuss the type of support available for customers who wish to install their own lighting and who provides this support.
- 34.2 Please explain BC Hydro’s rationale for transitioning RS 1755 Group 2 customers to RS 1701 instead of providing electrical service to customers in the same manner it would serve any existing customer installing lighting on their private property.

**35.0 Reference: PROPOSED TERMINATION OF RS 1755
Exhibit B-1, Section 6.4.2, p. 51; Exhibit B-4, BCUC IR 13.2, 13.8, 13.10; Exhibit B-5,
British Columbia Agriculture Council IR 1.4
Transition program**

On page 51 of the Application, BC Hydro states:

To assist customers with the search and installation of appropriate new lighting solutions, BC Hydro will recruit qualified outdoor lighting contractors from its Alliance of Energy Professionals network. Customers can contact BC Hydro for outdoor lighting contractor referrals. BC Hydro estimates that the cost to a customer of installing a replacement light could range from \$1,000 to \$7,000.

In response to British Columbia Agriculture Council (BCAC) IR 1.4, BC Hydro states:

...the provision of outdoor lighting using privately owned lamp standards in order to illuminate private property is a competitive service that can be provided by many service providers. As a result, it is not a service that is appropriately provided on a rate regulated basis by BC Hydro. Equipment and installation services are readily available from private sector organizations and BC Hydro’s view is that private sector organizations are better positioned than BC Hydro is to offer a competitive service to install outdoor lighting on private property.

In response to BCUC IR 13.2, BC Hydro states:

Group 1 and 3 customers wishing to continue illuminating their property can install their own lighting behind an existing or new service connection and be billed for electricity

consumption under the appropriate rate for the premises. This option also applies to RS 1755 Group 2 customers that do not choose to continue street lighting service under RS 1701, or where BC Hydro has determined that RS 1701 cannot be accommodated.

In response to BCUC IRs 13.8 and 13.10, BC Hydro states the following:

BC Hydro has investigated options for financing programs and determined that customers will be able to obtain financing through lighting distributors. BC Hydro has contacted several lighting distributors and confirmed their interest in providing financing for customers wishing to install their own lighting after termination of RS 1755.

BC Hydro intends to work with lighting distributors to introduce a financing program tentatively to be made available to customers in October 2021, which is one year prior to the start of RS 1755 lighting removal.

[...]

As identified in BC Hydro's response to BCUC IR 1.13.8, BC Hydro has identified that financing will be available through lighting distributors but has not yet worked with them to develop a program. Customers requiring a financing plan to install their own lighting will pay the lighting distributor in accordance with the financing program offered by the lighting distributor. Conceptually, the financing program would include costs of the material, labour and installation of the new light and pole, if required, as well as an interest charge.

[...]

There are 43 distributors registered with the Alliance that regularly carry and supply outdoor lighting. Out of these, ten have multiple branches throughout BC to service RS1755 customers. Remote product deliveries ensure that customers in any region of the province can be serviced through these Distributors.

- 35.1 Please provide the bill impact that current Group 1 and Group 3 RS 1755 customers will experience if they install their own lighting behind an existing or new service connection and are billed for electricity consumption under the appropriate rate for the premises.
- 35.2 Please confirm, or explain otherwise, that the estimated replacement lighting installation costs apply to all RS 1755 customer types (e.g., residential, commercial, Indigenous, governmental and municipal).
- 35.3 Given that Group 2 RS 1755 customers are currently serviced on public property, and on BC Hydro-owned poles, please explain the rationale in transitioning any RS 1755 customer outright to the applicable rate schedule.
 - 35.3.1 Please discuss BC Hydro's rationale for providing transition assistance to RS 1755 customers when competitive private outdoor lighting services already exist.
 - 35.3.2 Please explain why Group 2 RS 1755 customers will continue to receive unmetered service under RS 1701. In your response, please discuss how continuing service under RS 1701 on public property, given this service is not for public highway, streets and lanes is not considered "private" lighting.
- 35.4 Please confirm, or explain otherwise, if all 43 lighting distributors and/or vendors will offer financing options through the Transition Program.
- 35.5 Please discuss how BC Hydro concluded that the private outdoor lighting market is a competitive

service. In your response, please include the approximate number of vendors and/or installation contractors that offer private outdoor lighting services.

35.5.1 Please explain how BC Hydro has ensured that the lighting distributors and/or vendors can sufficiently meet the demand of transitioning RS 1755 customers across the province.

35.5.2 Please discuss whether the private sector offering of outdoor lighting services provide transitioning customers with fair value compared with comparable services provided on a rate regulated basis.

35.6 Compared to residential RS 1755 customers, please explain if commercial RS 1755 customers are subject to different terms and conditions of the available financing options offered through the Transition Program.

35.6.1 If available, please provide the interest rate(s) that will be available to RS 1755 customers seeking financing assistance from the financing options through the Transition Program.

35.6.1.1 Please confirm if interest rates will be consistent across all lighting distributors offering financing options to RS 1755 customers.

**36.0 Reference: PROPOSED TERMINATION OF RS 1755
Exhibit B-4, BCUC IR 13.6
RS 1755 migration**

In response to BCUC IR 13.6, BC Hydro states:

Exceptions to customers illuminating their properties under metered service are:

- RS 1755 Group 2 customers that migrate their service to RS 1701, which is an unmetered rate; and
- Under rare circumstances, through a new unmetered, Small General Service connection. This could occur when the configuration of the service connection makes it impractical or very costly for a customer to install a new metered service connection. Unmetered service is not permitted under Residential service.

36.1 Please confirm, or explain otherwise, that the new unmetered Small General Service connection stated above is associated with a new rate schedule yet to be introduced.

36.1.1 If confirmed, please discuss if BC Hydro intends to file a tariff application with the BCUC for changes to the Electric Tariff. In your response, please provide an anticipated application filing date.

36.1.2 If not confirmed, please clarify which Small General Service rate schedule would be applicable in this circumstance (e.g., RS 1234, RS 1300, RS 1301, RS 1310 or RS 1311).

36.1.2.1 Please confirm if there are any current RS 1755 customers receiving service under any of the above Small General Service rate schedules.

D. PROPOSED BACK-BILLING AMENDMENTS

**37.0 Reference: PROPOSED ELECTRIC TARIFF AMENDMENTS FOR BACK-BILLING OF UNMETERED SERVICES
Exhibit B-4, BCUC IR 15.1, 15.2, 15.6
Under-billing & unmetered billing reviews**

In response to BCUC IRs 15.1 and 15.6, BC Hydro states:

Other than field investigations triggered by the reviews described above, BC Hydro has not had a field audit program in which we have routinely sampled connections to customer-owned street lights or unmetered accounts to determine the accuracy of billing. This reflects the cost of such a program relative to the revenue perceived to be at-risk given the size of the individual loads and the nature of the customers with unmetered services (e.g., municipalities, large corporations).

[...]

In preparation for the Street Light Replacement Program, BC Hydro has been working with customers to confirm and update records of unmetered street lights, both BC Hydro-owned and customer-owned. We have also identified gaps in our processes that, for example, led to discrepancies between our asset inventories of BC Hydro-owned street lights and RS 1701 bills being issued. Additional control processes have been implemented and technology upgrades are underway to minimize the potential for such discrepancies, as well as to allow for discrepancies to be identified sooner should they occur. BC Hydro observes that some customers have similar challenges managing their field asset inventory records. [*emphasis added*]

BC Hydro has recently been working with a company with a very large number of unmetered Small General Service (SGS) connections to reconcile billing records and confirm the accounts are being appropriately billed. We have jointly developed processes and plans for ongoing audits/sampling to ensure accurate billing. BC Hydro intends to develop similar processes with other organizations with large numbers of unmetered SGS and street lighting connections.

[...]

On September 11, 2020, BC Hydro met individually with Shaw Communications Inc., the customer with the largest number of unmetered SGS services, to explain our proposed amendments and gather their feedback.

- 37.1 Please explain the additional control processes and technology that have been implemented to minimize asset discrepancies between BC Hydro-owned and customer-owned street lights.
- 37.2 Please expand on the processes and plans that were jointly developed between BC Hydro and Shaw Communications Inc.

E. PROPOSED TARIFF & HOUSEKEEPING AMENDMENTS

**38.0 Reference: SPECIAL CONDITIONS
Exhibit B-1, Section 5.4.3, p. 37; Exhibit B-4, BCUC IR 5.1, 5.2, 5.2.1, 5.6.2, 5.11
RS 1701 proposed amendments**

On page 37 of the Application, BC Hydro states:

BC Hydro proposes an amendment to allow BC Hydro to recover the undepreciated value and removal costs when customers request the removal of street lights before they are fully depreciated for any reason. The current provision in RS 1701 only allows BC Hydro to recover this cost if the street light is to be replaced with a different street light.

In response to BCUC IR 5.1, BC Hydro states:

BC Hydro did not consult customers on the remaining proposed changes to RS 1701 Special Conditions. In BC Hydro's view, the remaining proposed changes are updates to further clarify or align tariff languages to current business practices, to reflect changes required due to the LED street light replacement, to accommodate the transition of RS 1755 Group 2 customers to RS 1701, or to make RS 1701 available to additional customers when suitable for lighting private property. There will be no significant impact to current customers arising from these remaining proposed changes.

In response to BCUC IR 5.2, BC Hydro states:

The current Special Condition is not explicit regarding a customer request for an early removal of a street light. BC Hydro is not consistent in recovering the undepreciated value of RS 1701 street lights when a customer requests an early removal. In most cases, customers have not been charged for the undepreciated amount for an early removal unless the light is removed and replaced with another light (e.g., different wattage).

In response to BCUC IR 5.2.1, BC Hydro states:

If a RS 1701 street light is removed prior to its full depreciation, in most cases the undepreciated value is currently not recovered from the customer requesting the removal. These asset write-offs are forecast in BC Hydro's revenue requirements and these forecast amounts are currently recovered from all ratepayers.

38.1 Please explain BC Hydro's rationale for not recovering the undepreciated value of RS 1701 street lights instead of continuing with its current practice of not charging its customers.

38.2 Please explain why BC Hydro did not consult customers on the remaining proposed changes to RS 1701 Special Conditions when the proposed amendments would result in deviation from current practices.

In response to BCUC IR 5.6.2, BC Hydro states:

If discontinuation of service is required for the circumstances as listed in BC Hydro's response to BCUC IR 1.5.6, BC Hydro provides notice to the customer and works with them to offer the alternative of electricity service under RS 1702 for customer owned street lights.

38.3 Please explain what support BC Hydro provides customers while working with them to offer the alternative of electricity service under RS 1702 for customer owned street lights.

In response to BCUC IR 5.11, BC Hydro states:

The Customer is responsible for ensuring the lighting installed meets their purposes, illumination standards, and requirements. This includes vegetation maintenance around the street light required for illumination purposes; however, this is not currently stated in the Tariff.

38.4 Please explain how BC Hydro determines that the customer is responsible for ensuring the lighting installed meets their purposes, illumination standards and requirements including vegetation since it is not stated in the Tariff.

**39.0 Reference: BC HYDRO'S PROPOSED RS 1701 LED RATE
Exhibit B-1, Section 5.4.2, pp. 43–44; Exhibit B-5, BCSEA IR 5.3
Special Conditions**

On page 37 of the Application, BC Hydro proposes the following amendment, among others, to the RS 1701 Special Conditions:

BC Hydro proposes an amendment to allow BC Hydro to recover the undepreciated value and removal costs when customers request the removal of street lights before they are fully depreciated for any reason. The current provision in RS 1701 only allows BC Hydro to recover this cost if the street light is to be replaced with a different street light. However, as the cost implications of removing a light are identical whether or not the light is replaced, the amendment further protects other BC Hydro customers from incurring expenses due to decisions made by a customer taking service under RS 1701 to discontinue such service.

In response to BCSEA IR 5.3, BC Hydro states:

BC Hydro cannot predict the number of future RS 1701 removal requests as street light removals are based on changing needs of RS 1701 customers. In addition, the financial implication depends on the age of the street lighting at time of the removal requests. However, for reference, the table below shows the RS 1701 street lights removal requests received in calendar years of 2018, 2019 and 2020.

Year Completed	Total
2018	236
2019	198
2020	351
Grand Total	820

Customers are required to design their RS 1701 street lighting using the newly offered LED street lights prior to BC Hydro starting street light conversion in their area. We expect customers will take the opportunity to examine their current and future street lighting needs and encourage customers to remove street lights that are no longer needed. We expect to receive an increased number of removal requests, as well as additions and alterations, during the LED street light deployment period. These removal requests will not be subject to the Early Removal Fee as they will be completed before the new asset is installed.

39.1 Please confirm, or explain otherwise, that the total cost estimate for the scope of the LED

Replacement Program considered the expected reduction in street light replacements that are required based on the historical trend in street light removal requests from the 2018 to 2020 calendar years.

**40.0 Reference: PROPOSED TARIFF AMENDMENTS
Exhibit B-4, BCUC IR 16.1, 16.4
General service**

In response to BCUC IR 16.1, BC Hydro states:

For customers who are converting existing unmetered services to metered services, both the street lighting and general service loads are typically small (e.g., telecommunications equipment attached to street light poles). These accounts are likely to be charged under the Small General Service (SGS) rate. Although the SGS energy charge is slightly higher than RS 1702 and RS 1704, customers can benefit from the lower metering, service connection and administrative costs

- 40.1 Please provide a comparison of the Small General Service rate with the current rates applicable to RS 1702 and RS 1704.

In response to BCUC IR 16.4, BC Hydro states:

The City of Vancouver is the only customer that has requested metering of mixed services that include street lighting and General Service load. BC Hydro consulted with the City of Vancouver on the proposed Electric Tariff amendments; the City of Vancouver's feedback is included as Attachment 1 to this response.

BC Hydro did not consult with other interested parties about this proposed amendment. To date, no other customers have expressed interest or have submitted requests for metered mixed street light and General Service load. However, we anticipate that in the future additional municipal customers may be interested in this service and having it available to them would be beneficial. Further, as explained in BC Hydro's response to BCUC IRs 1.16.1 and 1.16.3, BC Hydro believes the proposals do not have negative revenue or cost impacts, and therefore do not have negative implications to other customers.

- 40.2 Have any other customers expressed an interest in metered mixed-use services? Please discuss.
- 40.2.1 If yes, please explain why BC Hydro did not consult with these parties about the proposed Electric Tariff amendments.