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June 30, 2021

GHG Reduction (Clean Energy) Regulation
Reporting
Director, Communities and Transportation
Electricity and Alternative Energy Division
Ministry of Energy, Mines and Low Carbon
Innovation
Email: GGRRReporting@gov.bc.ca

British Columbia Utilities Commission
GHG Reduction (Clean Energy) Regulation
Reporting

Email: commission.secretary@bcuc.com

**RE: Ministry of Energy, Mines and Low Carbon Innovation (MEMLCI or Ministry)
British Columbia Hydro and Power Authority (BC Hydro)
Greenhouse Gas Reduction (Clean Energy) Regulation Reporting Fiscal
2021 Annual Report**

BC Hydro writes to submit the Business Information and Declaration (Attachment 1), the Fiscal 2021 Greenhouse Gas Reduction (Clean Energy) Regulation (**GGRR**) Annual Report (**Report**) (Attachment 2) and Low Carbon Electrification Program Results in an excel format (Attachment 3). The Report includes results for the period from April 1, 2020 to March 31, 2021 (**Fiscal 2021**) for BC Hydro's prescribed undertakings as defined in section 4 and section 5 of the GGRR.

Under section 18 of the *Clean Energy Act*, a public utility implementing prescribed undertakings defined in the GGRR must submit to the MEMLCI a report respecting the prescribed undertakings. Specifically, section 18(5) states that "a report to be submitted under section (4) must include the information the minister specifies and be submitted in the form and by the time the minister specifies."

On April 15, 2021, BC Hydro received from the MEMLCI an updated reporting template for the period from April 1, 2020 to March 31, 2021 for prescribed undertakings under the GGRR. This report contains information that reflects this updated template.

BC Hydro is providing the un-redacted Report to the Ministry and BCUC in confidence. A public version of the Report is being filed under separate cover redacting customer-specific information or information that is commercially sensitive to BC Hydro or customers. Confidential information is not to be released publicly without prior consent of BC Hydro and/or the customer.

June 30, 2021
GHG Reduction (Clean Energy) Regulation Reporting
Director, Communities and Transportation
Electricity and Alternative Energy Division
Ministry of Energy, Mines and Low Carbon Innovation

British Columbia Utilities Commission
GHG Reduction (Clean Energy)
Regulation Reporting

Greenhouse Gas Reduction (Clean Energy) Regulation Reporting
CONFIDENTIAL Fiscal 2021 Annual Report

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For further information, please contact the undersigned.

Yours sincerely,



Chris Sandve
Chief Regulatory Officer

st/rh

Enclosures

**Greenhouse Gas Reduction (Clean Energy)
Regulation Reporting**

**Attachment 1
Business Information and Declaration**

Business Information and Declaration

Full Legal and Operating Name	Address Including Postal Code and Email	Telephone
British Columbia Hydro and Power Authority	333 Dunsmuir Street, Vancouver BC V6B 5R3	604-623-3726
Reporting Period:	April 1, 2020 to March 31, 2021 (Fiscal 2021)	
<p>I understand that the information in this report is collected for the purposes of administering the Greenhouse Gas Reduction (Clean Energy) Regulation under the authority of the <i>Clean Energy Act</i> and section 26 of the <i>Freedom of Information and Protection of Privacy Act</i>.</p> <p>I certify that records evidencing each matter reported under the Greenhouse Gas Reduction (Clean Energy) Regulation (the Regulation) Reporting Requirements are available on request.</p> <p>I certify that a record evidencing my authority to submit this report on behalf of the public utility is available on request.</p> <p>I certify that the information in this report is true and complete to the best of my knowledge and I understand that I may be required to provide to the Ministry of Energy, Mines and Low Carbon Innovation or the Commission records evidencing the truth of that information.</p>		
Signature of Authorized Signing Authority	Name and Title of Authorized Signing Authority (please print)	Date Signed YYYY/MM/DD
	Chris Sandve Chief Regulatory Officer	June 30, 2021

**Greenhouse Gas Reduction (Clean Energy)
Regulation Reporting**

Attachment 2

**Fiscal 2021 Annual Report No. 4
April 2020 to March 2021**

PUBLIC

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1 Executive Summary

This is BC Hydro's fourth annual report regarding its activities that are "prescribed undertakings" as defined in the Greenhouse Gas Reduction (Clean Energy) Regulation (**GGRR**) for the purposes of section 18 of the *Clean Energy Act* (**CEA**). It is provided in accordance with the April 2021 "British Columbia Greenhouse Gas Reduction (Clean Energy) Regulation Reporting Requirements" (**Reporting Requirements**) provided to BC Hydro by the Ministry of Energy, Mines and Low Carbon Innovation.

This report covers the annual period from April 1, 2020 to March 31, 2021 (**Fiscal 2021 or Reporting Period**) and BC Hydro's prescribed undertakings in three main classes:

- (i) Low Carbon Electrification (**LCE**) activities under section 4(3)(a), (b), (c), and (d) of the GGRR (collectively referred to as **LCE Programs**);
- (ii) LCE Infrastructure projects under section 4(2) and 4(3)(e) of the GGRR; and
- (iii) Electric vehicle (**EV**) charging stations under section 5 of the GGRR.

The expenditure for the LCE Programs in fiscal 2021 is approximately \$4.1 million, which covers the following undertakings:

- BC Hydro provided supporting resources¹ for nine new LCE studies and four new LCE incentive projects that are prescribed undertakings under section 4(3)(a) of the GGRR, further described in section [4.2](#) below;

¹ Supporting resources can include: funding provided by BC Hydro to enable studies, research, pilots, public awareness campaigns, projects, and enabling the development of standards.

-
- BC Hydro carried out public awareness campaign activities related to the EV charger ‘Top-up’ promotion from the previous fiscal year. These are prescribed undertakings under section 4(3)(a) of the GRR; and
 - BC Hydro provided supporting resources to enable the development of standards respecting technologies that use electricity instead of other sources of energy that produce more greenhouse gas emissions. These projects are undertakings prescribed under section 4(3)(d) of the GRR.

BC Hydro also made significant progress on the Peace Region Electricity Supply (**PRES**) Project, which is a LCE Infrastructure Project undertaking under section 4(2) of the GRR. In fiscal 2021, actual expenditure on the PRES Project was \$53.3 million, with a cumulative cost of \$206.2 million as at the end of fiscal 2021. It is premature to report any avoided greenhouse gas emissions for the PRES Project as it is not yet in-service. Total expenditures of \$1.4 million were incurred in fiscal 2021 with respect to a [REDACTED] generation agreement BC Hydro entered into with [REDACTED] (hereinafter referred to as **Company X**) to ensure the provision of reliable electricity service from the transmission system [REDACTED]. This is also an LCE Infrastructure Project undertaking under section 4(2) of the GRR.

During the Reporting Period, BC Hydro also constructed and operated EV fast charging stations which are prescribed undertakings under section 5 of the GRR by adding five new eligible charging sites to its network of EV fast charging stations. Four of these sites were constructed with two fast charging stations each, and the fifth site was constructed with a single fast charging station. In addition, 10 existing eligible charging sites with a single fast charging station were expanded with an additional fast charging station. At the end of the Reporting Period, there were 97 eligible charging stations at 71 eligible charging sites in BC Hydro’s fast charging network.

2 The GRR and Cost Recovery

Section 18(1) of the CEA empowers the Lieutenant Governor in Council to prescribe, by regulation, classes of undertakings for the purpose of reducing greenhouse gas (GHG) emissions. Public utilities that choose to engage in undertakings that are within one or more prescribed class of undertaking are assured of being able to recover the costs of the undertaking in their rates, and may not be prevented by the BCUC from engaging in the undertaking.

The GRR was first issued in 2012, and amended in 2017 by adding section 4 to the GRR to include eight new classes of electrification undertakings and in 2020 by adding section 5 to the GRR to include certain EV fast charging stations. Together, CEA section 18 and the GRR provide one of the statutory pillars of the Province's GHG emission reduction policy.

One of the legal consequences of the public utility program or project being a "prescribed undertaking" is that the public utility is entitled to recover the costs of the program or project in its rates. That legal consequence is meaningful only if the costs associated with particular programs and projects that are prescribed undertakings can be identified, and thus are accounted for, by the public utility. Accordingly, the prescribed undertakings described in this fiscal 2021 GRR Annual Report are those programs and projects with recorded costs in fiscal 2021.²

Pursuant to BCUC Order G-187-21, operating costs, depreciation, and cost of energy amounts related to the deployment and operation of BC Hydro's eligible EV fast charging stations and incurred during fiscal 2021 are deferred to the Electric Vehicle Costs Regulatory Account. As part of its fiscal 2023 to 2025 Revenue

² BC Hydro notes that the costs it incurs with regard to its LCE programs that are prescribed undertakings are all deferred to the DSM Regulatory Account, pursuant to Order in Council No. 100, issued March 1, 2017. Generally, the costs BC Hydro incurs in regard to its LCE Infrastructure Projects are capitalized.

Requirements Application, BC Hydro will apply for a recovery mechanism for this account.

3 State of the Market and Program Planning

3.1 Background

In December 2018, the Province launched the CleanBC Plan, which set out a pathway to enable the Province to meet its 2030 GHG emission targets. The CleanBC Plan calls for BC Hydro to continue to make investments in our transmission system to make it easier for large industrial operations to access clean electricity.

The February 2019 Minister's Mandate Letter to BC Hydro included an expectation for BC Hydro to continue to provide leadership in advancing the Province's climate action strategies, including through electrification, fuel switching, and energy efficiency initiatives in the built environment, transportation, oil and gas, and other sectors.

In July 2019, the Terms of Reference for Phase 2 of the Comprehensive Review (**Phase 2 Review**) were released by the Province. The objective of the Phase 2 Review is to develop recommendations that will strategically position BC Hydro for long-term success, while meeting the Province's climate goals, keeping rates affordable for British Columbians, furthering reconciliation with Indigenous Nations, and supporting quality economic development. The actions taken as part of the Phase 2 Review will support the Province's CleanBC plan, including to expand the electrification of our growing economy over the coming decades.

3.2 State of the Market Discussion

This section presents an overview of the LCE market with respect to BC Hydro's activities in fiscal 2021. Detailed information on the LCE Programs, LCE

Infrastructure Projects and EV fast charging stations is set out in section [4](#), section [5](#), and section [6](#) respectively below.

Beginning in fiscal 2018, BC Hydro moved forward with eight projects, referred to as Initial LCE Projects, to assess and support immediate low carbon electrification opportunities among our customers. These projects are within one (or more) class of undertakings defined in subsections 4(3)(a) and 4(3)(c). These Initial LCE Projects also:

- Helped us gain a greater understanding of the technology, market, and barriers that customers and BC Hydro would face when developing low carbon electrification options; and
- Provided BC Hydro with the ability to act early and capture time sensitive opportunities that could help inform the development of a broader low carbon electrification plan.

The Initial LCE Projects introduced in the GRRR Annual Report filed in July 2018 have been updated in subsequent reports as the expenditures were incurred. They are also included in [Table 5](#) within this report.

In fiscal 2019, BC Hydro developed and advanced a multi-year BC Hydro funded LCE program that was designed to work in coordination with the Province's programs and is generally referred to as the BC Hydro LCE Program. The BC Hydro LCE Program is further described in section [4](#).

BC Hydro is forecast to be in an energy surplus position for an extended period of time. During this surplus period, the LCE-driven incremental electricity sales will increase BC Hydro's revenues and can make rates lower than they otherwise would have been to the extent there is a positive differential between domestic electricity rates and forecast export prices. These incremental electricity sales are also

expected to reduce GHG emissions relative to what they otherwise would have been. .

Pursuant to the Reporting Requirements, a report by a Fairness Advisor must be provided on the competitiveness of any call process held during the Reporting Period. Consistent with our DSM process, opportunities for LCE Programs are solicited broadly through BC Hydro's customer and community-facing employees and our existing commercial and industrial energy manager networks. In fiscal 2021, BC Hydro did not hold any call processes in regard to its LCE Programs or its LCE Infrastructure Projects. Therefore, no Fairness Advisor report is required.

BC Hydro issued tenders for construction services and equipment purchases for the installation of fast charging stations in fiscal 2021. The tenders followed standard procurement processes at BC Hydro, using bidding platforms such as BC Bid.

3.3 Province of B.C. Programs

In fiscal 2019, BC Hydro became responsible for delivering the CleanBC Better Buildings program (initially called EfficiencyBC) on behalf of the Province. The CleanBC Better Buildings is a program funded by provincial and federal governments that provides financial incentives to help households and businesses save energy and reduce GHG emissions by switching to high efficiency heating equipment and making building envelope improvements. BC Hydro is delivering the component of the CleanBC Better Buildings program that helps customers switch from fossil fuels to clean electricity.

In fiscal 2020, BC Hydro became responsible for delivering the CleanBC 'Go Electric BC' EV charger rebate program. The program provides rebates toward the cost of the purchase and installation of eligible level 2 EV charging equipment and supports multi-unit residential buildings (**MURB**) and workplaces seeking solutions for their EV charging needs. The CleanBC program influences what programs BC Hydro

funds as it seeks to align with and complement the programs and projects funded by the Province through the CleanBC program. BC Hydro's programs that complement the CleanBC programs are discussed in section [4](#) below.

In fiscal 2021, the Province launched three new CleanBC programs. The CleanBC Indigenous Community Energy Coaching program provides free energy coaching services to support Indigenous communities wanting to take advantage of the CleanBC Indigenous Community Heat Pump Incentive and related energy efficiency offers. The CleanBC Better Homes New Construction program provides rebates for the construction of new, high-performance, electric homes. The CleanBC Commercial Express Program provides support to building owners and operators who wish to reduce greenhouse gas (**GHG**) emissions in their existing commercial buildings. The program targets simple, smaller electrification opportunities across commercial and institutional buildings. These programs are funded by the Province, and BC Hydro administers these programs on behalf of the Province.

3.4 Electric Vehicle Fast Charging Stations

At the beginning of fiscal 2021, BC Hydro had 81 fast charging stations in operation across the province, including three that were decommissioned during the fiscal year. At the end of fiscal 2021, BC Hydro had 97 eligible fast charging stations in operation at 71 sites. During fiscal 2021, BC Hydro continued to build out its EV fast charging network, by deploying 19 EV eligible fast charging stations. Nine of these fast charging stations were at five new sites (i.e., two charging stations at four sites, and a single charging station at the remaining new site), and 10 fast charging stations were added to existing sites that have single EV fast charging stations.

Throughout fiscal 2021, BC Hydro continued to work with the Ministry of Energy and Low Carbon Innovation (**MEMLI**), the Ministry of Transportation and Infrastructure (**MOTI**), and FortisBC to plan an efficient deployment of EV fast charging stations

and to meet the provincial objective of a province-wide EV fast charging network which will enable inter-city travel with an EV.

All of BC Hydro's EV fast charging stations are all in compliance with requirements of section 5 of the GGRR.

4 LCE Programs

4.1 Overview

There are eight new classes of electrification undertaking prescribed by section 4 of the GGRR, which can be divided into two broad categories: (i) those that are program based, similar to BC Hydro's demand-side management programs;³ and (ii) those that are infrastructure based.⁴ BC Hydro refers to all the prescribed undertakings it carries out under section 4 of the GGRR as LCE activities, and further refers to its undertakings that fall within one of the classes in the former category as LCE Programs, and to its undertakings that fall within one of the classes in the latter category as LCE Infrastructure Projects. This nomenclature corresponds to the "Electrification Programs" referred to in subsection 6.7 of the GGRR Reporting Requirements, and "Transmission, Distribution and Generation" referred to in subsection 6.8 of the GGRR Reporting Requirements, respectively.

In fiscal 2021, BC Hydro spent approximately \$4.1 million on its LCE Programs, including expenditures for the Initial LCE Projects and the BC Hydro LCE Program. The expenditures supported four new projects, nine new studies, and public awareness campaign activities, all undertaken in accordance with section 4(3)(a) and 4(3)(b) of the GGRR. BC Hydro also incurred expenditures to enable the

³ Being the classes of undertaking prescribed by subsections 4(3)(a)(i), 4(3)(a)(ii), 4(3)(b)(i), 4(3)(b)(ii), 4(3)(c) and 4(3)(d) of the GGRR. Undertakings can be both projects or programs. For simplicity, BC Hydro may refer to projects under these sections as programs as well or use projects/program interchangeably.

⁴ Being the classes of undertaking prescribed by subsections 4(2) and 4(3)(e) of the GGRR.

development of standards under section 4(3)(d) of the GGRR. These LCE undertakings are discussed in section [4.2](#).

In fiscal 2021, BC Hydro made new funding commitments of approximately \$0.5 million, but there are no expenditures for the studies and projects associated with those commitments in the financial reporting for fiscal 2021. As noted in previous Annual Reports, funding commitments that did not result in expenditures in fiscal 2021 are not included in this Reporting Period, but will be included in a future GGRR report for the fiscal year when the expenditures are incurred.

As discussed above, since fiscal 2019, BC Hydro has been delivering the CleanBC Better Buildings program on behalf of the Province. In fiscal 2019, to complement the Province's program, BC Hydro developed and advanced a multi-year BC Hydro funded LCE Program to reach customers and to enable opportunities not covered by GHG emissions reduction programs funded by the Province or the federal government.⁵ BC Hydro approved expenditures of \$16.6 million for this multi-year program, focusing on opportunities in industrial process, transportation, and new construction.

In fiscal 2020, the Province, working in co-ordination with BC Hydro, decided to add a CleanBC program for new construction. The introduction of this new program prompted BC Hydro to re-consider the funding originally included within the multi-year BC Hydro LCE Program. BC Hydro decided to apply funds originally intended for supporting new construction opportunities to supporting additional energy management study and implementation opportunities for industrial and large commercial customers.

In fiscal 2021, as part of BC Hydro's multi-year program, BC Hydro undertook activities as prescribed undertakings falling under section 4(3)(a), section 4(3)(b),

⁵ This multi-year program is also referred to as the "BC Hydro LCE Program" to distinguish it from the programs funded by the Province.

and section 4(3)(d) of the GGRR. These undertakings are discussed in section [4.2](#) below. Also in fiscal 2021, BC Hydro began the development of a broad electrification plan which will describe BC Hydro's actions supporting customer fuel switching. The plan will be provided in BC Hydro's Fiscal 2023 – Fiscal 2025 Revenue Requirements Application.

4.2 Fiscal 2021 LCE Programs

The projects and activities within the LCE Programs (i.e., classes of undertaking prescribed by subsections 4(3)(a)(i), 4(3)(a)(ii), 4(3)(b)(i), 4(3)(b)(ii), 4(3)(c) and 4(3)(d) of the GGRR) that incurred expenditures in fiscal 2021 are listed below. [Table 5](#) includes the LCE Programs results for fiscal 2021, and [Figure 1](#) and [Figure 2](#) show LCE Programs activities and expenditures by geographic distribution and sector distribution, respectively.

Consistent with the Reporting Requirements, two larger upstream natural gas projects have been described at a project level, while the remaining fiscal 2021 activities are components of the BC Hydro LCE Program, and have been aggregated and summarized at the program level:

- (iv) [REDACTED] (**Project 3** in [Table 5](#)): This project is interconnected to BC Hydro transmission line [REDACTED] in Northeastern B.C. The supporting funding from BC Hydro is to assist the customer in the acquisition, installation, and use of equipment that will use BC Hydro's electricity instead of natural gas to power natural gas extraction, processing and production operations, and it is an undertaking within the class of prescribed undertakings set out in section 4(3)(a) of the GGRR. There are multiple project phases. The first two phases achieved Facility Commercial Operation Date (**Facility COD**)⁶ in fiscal 2019 and fiscal 2020, respectively, pursuant to the terms of the LCE

⁶ Under the Incentive Agreement, Facility COD is required before an incentive fund payment can be made to the customer.

Incentive Agreement for the project. A third phase of this project was originally planned for fiscal 2021 but the expected completion date for the phase has shifted to fiscal 2022. Further project phases are expected to achieve Facility COD in subsequent fiscal years;

- (v) [REDACTED] (Project 4 in [Table 5](#)): BC Hydro has an LCE Incentive Agreement for the [REDACTED] site. This project is interconnected to BC Hydro transmission line [REDACTED] in Northeastern B.C. There are multiple project phases. Similar to Project 3, this project is an undertaking within the class of prescribed undertakings set out in section 4(3)(a) of the GGRR. Project 4 was energized in fiscal 2019 and the first two phases achieved Facility COD in fiscal 2020 in accordance with the LCE Incentive Agreement. A third phase was originally planned for completion in fiscal 2021, but is currently expected to complete in fiscal 2022; and
- (vi) The BC Hydro LCE Program: [Table 1](#) outlines the components of the BC Hydro LCE Program and the relevant subsections of the GGRR.

Table 1 Components of the BC Hydro LCE Program

Components	GGRR Subsection
Energy Management Studies and Incentives	4(3)(a), 4(3)(b)
Public Awareness Campaigns	4(3)(a), 4(3)(b)
Research and Pilots	4(3)(c)
Standards Enabler	4(3)(d)
Education & Training	4(3)(b)

An overview of activities in fiscal 2021 for each of the components of the BC Hydro LCE Program is provided below.

Energy Management Studies and Incentives: BC Hydro provided two types of funding related to energy management. First, BC Hydro provided funding to customers for studies and assessments which would assist customers, or those who may become customers, to identify and develop project opportunities involving the

acquisition, installation, or use of equipment that uses electricity instead of other sources of energy that produce more greenhouse gas emissions. [Table 2](#) below provides descriptions of the studies that were funded. Second, BC Hydro provided incentive funding to projects of customers, or those who may become customers (also referred to incentive projects), which would assist in the acquisition, installation, or use of equipment that uses electricity instead of other sources of energy that produce more greenhouse gas emissions. [Table 3](#) below provides descriptions of the incentive projects that were funded. In fiscal 2021, expenditures for Energy Management Studies and Incentives are reflected in the BC Hydro LCE Program (row 10 in [Table 5](#)).

Table 2 Energy Management Studies

Sector	Description	Location	Studies Completed	GGRR Sub-section
Built Environment	Two studies for the built environment sector were completed in fiscal 2021. One study investigated the low carbon electrification options for space heating of an office building. The other study examined low carbon electrification options for a district energy system of a post-secondary institution. The study examined both retrofit opportunities and future new construction.	Lower Mainland, Southern Interior	2	4(3)(a)

Sector	Description	Location	Studies Completed	GGRR Sub-section
Industrial Process	<p>Six studies for the industrial process sector were completed in fiscal 2021.</p> <p>One study examined a low carbon electrification option for a portion of the route used to transport material for a mine operation in the Southern Interior.</p> <p>A second study in the Southern Interior investigated the use of a low carbon electrification option in place of fossil fuels for the heating system of the ventilation shaft of a mine operation.</p> <p>Two studies of low carbon electrification options for natural gas processing were completed for two different sites in the Northern Interior.</p> <p>A study was completed for a mining operation in the Northern Interior. It examined the used of a low carbon electrification option in place of diesel power for tunneling operations.</p> <p>A study investigating low carbon electrification options for steam powered equipment was completed for a facility in the Vancouver Island / Sunshine Coast region.</p>	Southern Interior, Northern Interior, Vancouver Island / Sunshine Coast	6	4(3)(a)
Transportation	<p>One study was completed in the transportation sector in fiscal 2021. This study examined terminal infrastructure modification and charging systems to support electrification of marine vessels.</p>	Vancouver Island / Sunshine Coast	1	4(3)(a)

Table 3 Incentive Projects

Sector	Description	Location	Incentive Projects Completed	GGRR Sub-section
Built Environment	<p>One incentive project was completed in fiscal 2021.</p> <p>A facility was switched from diesel power to electric power by adding their own substation to connect to the BC Hydro transmission system.</p>	Vancouver Island / Sunshine Coast	1	4(3)(a)

Industrial Process	Three incentive projects in the Industrial Process sector completed in fiscal 2021. A mining operation built a new power line to power remotely located equipment and switch from diesel power to electric. A mining operation replaced a diesel powered hauling equipment with battery electric. A mine built a new power line to a remotely located equipment which enabled switching from diesel power to electric.	Northern Interior, Southern Interior	3	4(3)(a)
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Public Awareness Campaign: This includes public awareness activities carried out by BC Hydro to educate customers with regard to energy use and greenhouse gas emissions. Public awareness campaign expenditures in fiscal 2021 represent the trailing costs of the EV charger ‘Top-up’ promotion from the previous fiscal year. The public awareness campaign program and ‘Go Electric BC’ EV charger rebate ‘Top-up’ promotional program are undertakings within the class of prescribed undertakings set out in section 4(3)(a) of the GRR. The fiscal 2021 expenditures for this public awareness campaign are included in the BC Hydro LCE Program (row 10 in [Table 5](#)).

Standards Enabler: BC Hydro worked with standards making bodies such as various levels of government, who are responsible for land use, building codes, product and equipment standards, policies, bylaws, and community plans, to advance standards for technologies that use electricity instead of other sources of energy that produce more greenhouse gas emissions, or standards for technologies that affect the use of electricity by other technologies that use electricity instead of other sources of energy that produce more greenhouse gas emissions. BC Hydro’s activities in this regard target the transportation and building sectors.

BC Hydro undertook the following work with regard to transportation electrification:

- BC Hydro provided support for the implementation of EV ready bylaws and for the development of an updated best practice guide on EV ready requirements

for both residential and non-residential new buildings. Best practices were shared widely through a local government EV peer network;

- BC Hydro supported a local government-led study that investigates the role that local governments can play in accelerating medium and heavy-duty zero emissions vehicle adoption; and
- BC Hydro is piloting a program to advance transportation electrification within local government transportation departments by developing transportation network design requirements, land use plans, policy and bylaws, permitting, and building codes.

BC Hydro undertook the following work with regard to building electrification:

- BC Hydro, the Province and the City of Vancouver supported a study on a Building Electrification Road Map (BERM) for BC, based on consultation with over 150 stakeholders. The BERM's purpose is to provide recommendations to key building sector stakeholders on the necessary steps to achieve a smooth market transformation that achieves government emission reduction goals;
- Through a local government working group and an industry and Provincially led advisory committee, BC Hydro provided supporting resources for the development of a Low Carbon Policy Toolkit. The Toolkit provides practical guidance and recommendations on policies, guidelines and bylaws that any local government can adopt to support building electrification; and
- Some local governments are taking steps to encourage electrification of new construction through structuring their Energy Step Code requirements. BC Hydro supported local governments in the development of a best practice bulletin, which summarizes a standardized approach and supports policy consistency.

Standards Enabler undertaking expenditures fall under section 4(3)(d) of the GGRR. In fiscal 2021, expenditures for Standards Enabler undertakings are reflected in the BC Hydro LCE Program (row 12 in [Table 5](#)).

4.3 Methodology and Verification Methods

Depending on individual projects or programs within the LCE Programs, there can be up to four distinct activities that BC Hydro may use to review and verify estimates of incremental electrical load and emission reductions arising from electrification. These are: (i) technical review; (ii) site inspection; (iii) measurement and verification; and (iv) evaluation. Results from each area may be used in project or program management to ensure that BC Hydro receives the expected benefits. BC Hydro is selective in the use of these processes, and focuses its efforts where warranted to improve the accuracy of estimates and reduce exposure to risk. This approach mirrors BC Hydro's current approach to demand-side management electricity savings and provides estimates for both additional electricity demand and greenhouse-gas emission reductions.

The GHG emission reduction estimates are developed as part of the technical review for each project or program application and may be adjusted based on the outcome of site inspections and the electricity demand findings resulting from the measurement and verification activities.

The methodology BC Hydro has used to estimate GHG emission reductions involves developing engineering estimates of the amount of carbon-based fuel that will be offset by electricity and quantifying the associated GHG emission reductions using the 2017 B.C. Best Practices Methodology for Quantifying Greenhouse Gas Emissions. The calculation nets out the GHG emissions associated with BC Hydro's electricity, which are also quantified using the 2017 B.C. Best Practices Methodology for Quantifying Greenhouse Gas Emissions.

This estimate may differ from actual GHG emission reductions as determined by the customer specific to their unique electrification project(s). Where an actual value has been provided to BC Hydro by the customer, or reported by the customer to the government through an Industrial Emissions Report, BC Hydro will show the customer-reported value in Column H (i) of [Table 5](#). BC Hydro may also conduct a technical review of baselines, calculations, and assumptions used to determine the GHG reductions in the Industrial Emissions Report. Any changes to the value reported in a previous reporting period will be reflected in the cumulative values in Column H (ii) of [Table 5](#). The methodology used for typical electrical energy impact calculations for LCE projects is as follows:

- Total annual energy consumption = facility baseline electricity consumption + incremental LCE electricity consumption +/- baseline energy adjustments; and
- Total average monthly electrical demand = baseline average monthly electrical demand + incremental LCE average monthly electrical demand +/- baseline demand adjustments.

Baseline adjustments are determined based on any net baseline energy consumption impacts that may be a result of the LCE project.

Each of four LCE incentive projects described in [Table 3](#) has gone through a technical review and has a site specific measurement and verification (**M&V**) plan for the estimated additional electricity consumption and average demand. M&V plans are included as part of the funding agreement between BC Hydro and the recipient. The respective methodology used for these four projects generally follow 'Option B, Retrofit Isolation: All Parameter Measurement', as set out in the International Performance Measurement & Verification Protocol (**IPMVP**) - Core Concepts October 2016 EVO 10000 - 1:2016.

4.4 Performance Metrics

Performance measurement for BC Hydro LCE programs and projects ultimately is reflected in decisions made by customers or those who may become customers to use electricity instead of other sources of energy that produce more greenhouse gas emissions.

Public awareness campaigns, energy management studies, research/pilot projects, education and training and providing funds to assist in the acquisition, installation or use of equipment that uses or affects the use of electricity are critical in enabling customers, or those who will become customers, to develop reasons and justifications to implement a fuel-switching project. Additionally, these activities provide key inputs into BC Hydro program development and design.

Performance of standards enabler undertakings considers whether the support may yield information to enable government efforts in the advancement of standards, policies, bylaws, and community plans for the electrification of certain sectors, such as new construction and retrofits within the built environment and transportation sectors.

Performance measured using the measurement and verification methodologies described in section [4.3](#), provides a view of electrical consumption, demand, and GHG emission reductions. Measurement and verification activities for the projects completed in fiscal 2021 are still underway.

A measurement and verification report was completed in fiscal 2021 for the Thompson Rivers University project, which was installed in fiscal 2019. The verified electricity consumption for the project is 1,129 MWh per year, which is about 41 per cent of initial review estimated energy consumption. The annual natural gas savings are estimated to be 4,838 GJ, with an associated GHG reduction of 229 tonnes CO₂e per year. The lower than expected consumption was primarily due

to a change in the design made after the initial BC Hydro review. The measurement and verification results have been incorporated in [Table 5](#).

4.5 Cost-Effectiveness

Under section 4(4) of the GGRR, undertakings are in the class of undertakings prescribed by sections 4(3)(a) or 4(3)(b) of the GGRR only if they satisfy a cost-effectiveness test. That cost-effectiveness test is defined in section 4(1) of the GGRR and requires that each undertaking that is an undertaking within the class of undertakings prescribed by subsections 4(3)(a) or 4(3)(b) of the GGRR have a positive net present value (**NPV**), with the measure of a program's NPV being that of all of the programs that fall within the class of undertakings described in subsections 4(3)(a) and 4(3)(b) of the GGRR. The GGRR cost-effectiveness test is measured only at the time BC Hydro decides to carry out the program.

[Table 5](#) shows the GGRR net present value (**NPV**) of the various LCE projects or programs prescribed under section 4(3)(a) and 4(3)(b) of the GGRR. The total GGRR NPV of these undertakings is \$114 million which includes actual and committed expenditures and benefits from past, current, and future reporting periods. The GGRR NPV indicates that these undertakings are cost-effective.

4.6 Summary of Results

4.6.1 Explanation of Terms

[Table 4](#) below includes a description of the information provided in [Table 5](#) with regard to the LCE Programs.

**Table 4 LCE Programs Results Table:
 Explanation of Terms**

Column	Heading	Descriptions
A	GGRR	Applicable section of the GGRR.
B	Project / Program / Contract / Expenditure	Low-carbon electrification activities to encourage or enable the use of electricity in place of other sources of energy that produce more greenhouse gas emissions.

Column	Heading	Descriptions
C ⁽ⁱ⁾	Actual Expenditure (\$ million)	Costs incurred at the end of the current reporting fiscal year.
C ⁽ⁱⁱ⁾	Cumulative: Actual Expenditures (\$ million)	The sum of successive costs incurred as at the end of the reporting fiscal year.
D	Cost Effectiveness (\$ million): NPV to 2030 (fiscal 2031)	The present value of the costs and benefits are determined using a discount rate equal to BC Hydro's weighted average cost of capital. The present value of the costs is subtracted from the present value of the benefits from the project start year to last year in the calculation period (fiscal 2031) to determine the net present value for the project.
E	Cost Effectiveness (\$ million): GGRR NPV to 2030 (fiscal 2031)	The calculation of the GGRR NPV is based on costs and benefits as of fiscal 2018 as defined in the GGRR. Per that definition, benefits mean all revenues BC Hydro expects to earn as a result of implementing LCE programs falling under subsections 4(3)(a) or 4(3)(b), less revenues that would have been earned from the sale of that electricity to export markets. Costs mean all the costs BC Hydro expects to incur to implement LCE programs falling under subsections 4(3)(a) or 4(3)(b), including development and administration costs. For clarity, costs include historic and future cost, committed expenditures and benefits from past, current and future reporting periods.
F ⁽ⁱ⁾	Actual: Additional Energy Consumption (MWh/year)	The average annual additional energy consumption estimated to be delivered from the project in the current reporting fiscal period.
F ⁽ⁱⁱ⁾	Cumulative: Additional Energy Consumption (MWh/year)	The sum of the successive average annual additional energy consumption estimated to be delivered from the project as at the end of the reporting fiscal period.
G ⁽ⁱ⁾	Actual: Additional Capacity Demand (MW)	The total energy demand added.
G ⁽ⁱⁱ⁾	Cumulative: Additional Capacity Demand (MW)	The sum of the successive energy demand addition.
H ⁽ⁱ⁾	Actual: Estimated GHG Emission Reductions (tonnes CO ₂ e/year)	The average annual tonnes per year of carbon dioxide equivalent reductions from the project in the current reporting fiscal period.
H ⁽ⁱⁱ⁾	Cumulative: Estimated GHG Emission Reductions (tonnes CO ₂ e/year)	The sum of the successive additional average annual tonnes per year of carbon dioxide equivalent reductions from the project as at the end of the reporting fiscal period.

4.6.2 Results Table

[Table 5](#) below summarizes information regarding the LCE Programs that are undertakings prescribed by sections 4(3)(a)(i), 4(3)(a)(ii), 4(3)(b)(i), 4(3)(b)(ii), 4(3)(c)

and 4(3)(d) of the GGRR. The indications of "n/a" in [Table 5](#) are due to: (1) the nature of the project, study, research or program, such that the requested information cannot be obtained; or (2) the project, study, or program are prescribed by sections 4(3)(c) and 4(3)(d) of the GGRR and the cost-effectiveness test does not apply. Attachment 3 provides an excel spreadsheet with annual expenditures, in total and by project, study, or program, as outlined in the GGRR Reporting Requirements.

Table 5 LCE Programs Results for Year Ending March 31, 2021

	A	B	Municipality / Location	Start Date ⁶	C		D	E	F		G		H	
					Expenditure ² (\$ million)		Cost Effectiveness (F2018\$ million)	Additional Energy Consumption ³ (MWh/year)	Additional Demand (MW)	Estimated GHG Emission Reductions (tonnes CO ₂ e/year)				
	GGRR	Project / Program / Contract / Expenditure			Actual F2021 (i)	Cuml. F2018-F2021 (ii)	NPV to 2030 (Fiscal 2031)	GGRR NPV to 2030 (Fiscal 2031)	Actual F2021 (i)	Cuml. F2018-F2021 (ii)	Actual F2021 (i)	Cuml. F2018-F2021 (ii)	Actual F2021 (i)	Cuml. F2018-F2021 (ii)
1	4(3)(c)	Vancouver Fraser Port Authority	Vancouver	Fiscal 2018	0.00	0.07	0.0	0.0	0	0	0.0	0.0	0	0
2	4(3)(c)	[REDACTED] (Project 1) ⁴	[REDACTED]	Fiscal 2018	0.00	0.00	0.0	0.0	0	0	0.0	0.0	0	0
3	4(3)(c)	[REDACTED] (Project 2) ⁴	[REDACTED]	Fiscal 2018	0.00	0.01	0.0	0.0	0	0	0.0	0.0	0	0
4	4(3)(c)	BC Hydro Program Staff Labour			0.00	0.12	0.0	0.0	0	0	0.0	0.0	0	0
5	4(3)(a)	[REDACTED] (Project 3) ⁵	[REDACTED]	Fiscal 2018	0.16	7.93	64.3	64.3	0	130,305	0.0	17.5	0	77,911
6	4(3)(a)	[REDACTED] (Project 4)	[REDACTED]	Fiscal 2018	0.00	11.25	45.9	110.2	0	186,150	0.0	25.0	0	111,302
7	4(3)(a)	Thompson Rivers University ⁷	Kamloops	Fiscal 2018	-0.07	0.21	0.3	110.5	-1,608	1,129	0.3	0.6	-333	229
8	4(3)(c)	Copper Mountain Mine	Princeton, Southern Interior	Fiscal 2018	0.00	0.07	0.0	110.5	0	0	0.0	0.0	0	0
9	4(3)(c)	Translink	Lower Mainland	Fiscal 2018	0.00	0.50	0.0	110.5	0	1,254	0.0	0.8	0	215
10	4(3)(a)(b)	BC Hydro LCE Program	Province-wide	Fiscal 2019	2.85	6.33	3.5	114.0	4,709	4,709	0.7	0.7	3,630	3,630
11	4(3)(c)	BC Hydro LCE Program ⁸	Province-wide	Fiscal 2019	0.00	0.44	0.0	114.0	0	0	0.0	0.0	0	0
12	4(3)(d)	BC Hydro LCE Program	Province-wide	Fiscal 2019	1.18	1.44	0.0	114.0	0	0	0.0	0.0	0	0
		Total			4.12	28.37	114.0	114.0	3,101	323,547	1.0	44.6	3,297	193,286

¹ LCE Programs shown in the table include both LCE Initial Projects (rows 1 to 9) and associated expenditure and the BC Hydro LCE Program (rows 10 to 12). LCE Initial Projects are reported individually. With the introduction of the BC Hydro LCE Program individual project expenditures have been aggregated.

² Where a project/program has no actual or cumulative expenditures, but has an NPV, this means that the decision to go ahead with that project/program was made in this (or previous) Reporting Periods, but that the project/program is not expected to be implemented until a future year.

³ Values reported in column F represent the 'run rate' or annualized rate of additional energy consumption.

⁴ Project 1 and 2 were described in the fiscal 2018 Annual Report filed in July 2018.

⁵ Fiscal 2021 expenditures for Project 3 represent a missed accrual for a portion of the second phase of the project which completed in fiscal 2020.

⁶ The Start Date is the fiscal year that BC Hydro decided to proceed with the project or program.

⁷ The negative expenditure in fiscal 2021 represents an adjustment to the incentive amount and the negative energy consumption also represents an adjustment, following completion of the Measurement and Verification report.

⁸ A fleet electrification study was undertaken in fiscal 2021, but not put forward as a prescribed undertaking. The \$68,000 expenditure for the study was expensed as an operating cost in fiscal 2021.

4.7 LCE Programs by Region and Sector

The GRR Reporting Requirements also request graphical depictions of the distribution by region in the Province and the distribution by customer sector where possible. The requested graphical depictions are provided below. The sectors (built environment, industrial process, and transportation) shown in the chart below align with those reflected in the CleanBC plan and in the description in section [4.2](#) of this report.

For the purpose of showing LCE Program activities distributed by region and by sector we have used the term ‘Project’ to represent individual studies, research or pilot activities, or implementation projects where customers have acquired and installed equipment that uses electricity instead of other sources of energy that produce more GHG emissions as described in section [4.2](#). We did not include Public Awareness Campaigns in [Figure 1](#) or [Figure 2](#) as those activities were carried out Province-wide and targeted a single sector (transportation) and as such would not be meaningful in a graphical depiction.

[Figure 1](#) below highlights that the highest number of projects are in the Southern Interior, while [Figure 2](#) below highlights that most of the projects are in the industrial process sector.

Figure 1 Projects by Geographic Region

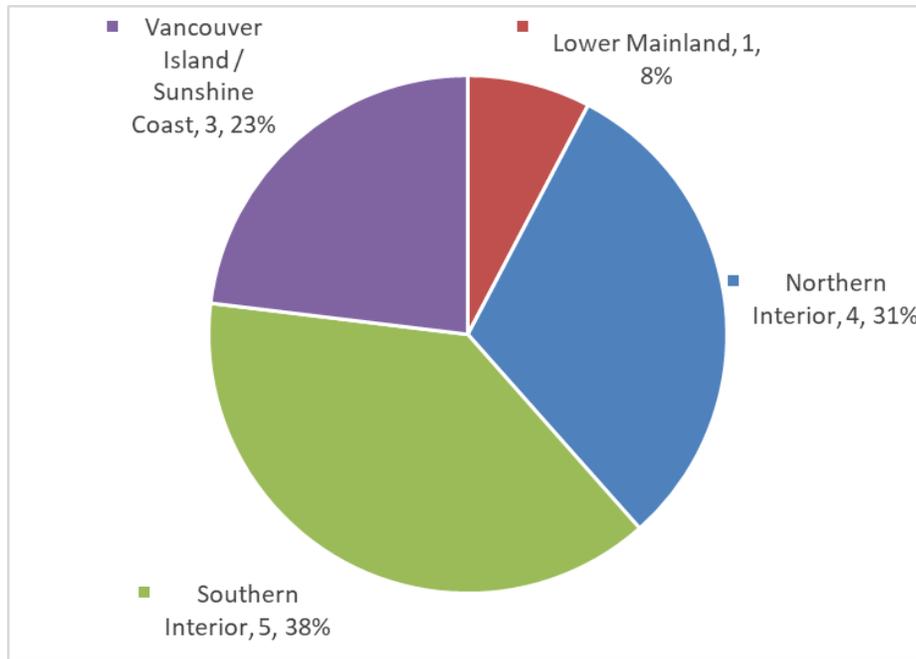
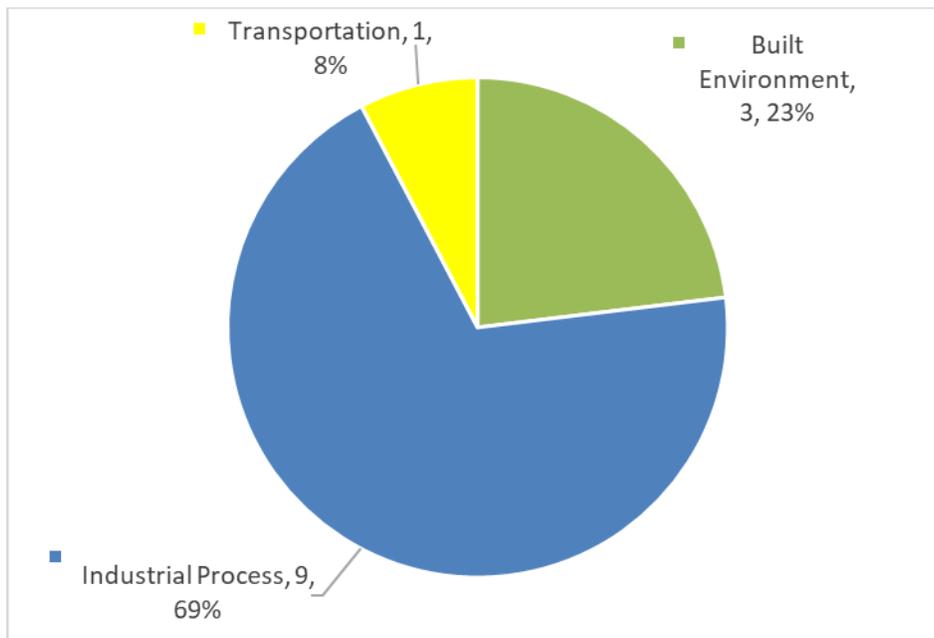


Figure 2 Projects by Sector



5 LCE Infrastructure Projects

5.1 Overview

In this section, we describe the LCE Infrastructure Projects (i.e., being projects within the classes of undertaking prescribed by subsections 4(2) or 4(3)(e) of the GGRR) and available evaluation results.

Northeast British Columbia is forecasted to experience a significant increase in natural gas production and processing capacity, primarily in the Montney region. In the absence of adequate electricity supply, much of this development will be powered by natural-gas fired production processes. Meanwhile, BC Hydro's transmission system in this region is constrained. Accordingly, BC Hydro will construct and operate new transmission and distribution facilities, and/or provide for [REDACTED] generation until such system upgrades are completed. These LCE Infrastructure Projects will enable the provision of reliable electricity service as a power supply alternative to carbon-based fuels, which will enable the reduction of existing GHG emissions or avoidance of future incremental GHG emissions.

5.2 Fiscal 2021 LCE Infrastructure Projects

In fiscal 2021, BC Hydro incurred expenditures of \$54.7 million in regard to two LCE Infrastructure Projects. Expenditures incurred and recorded in future fiscal years will be included in the applicable future GGRR annual report.

5.2.1 Peace Region Electricity Supply (PRES) Project

The PRES Project was introduced in the fiscal 2018 GGRR Annual Report. As explained in the fiscal 2018 report, the PRES Project will enable natural gas producers and processors to electrify their existing and new operations, rather than self-supplying with natural gas. This includes natural gas producers and processors as defined in GGRR sections 4(2)(a)(i) and (ii). The PRES Project is expected to reduce GHG emissions in B.C. from any existing plant or from any prospective new

plant that elects to take supply from BC Hydro rather than self-supply using natural gas.

The PRES Project was approved for implementation by BC Hydro's Board of Directors in June 2018. When BC Hydro's Board of Directors approved the PRES project, BC Hydro reasonably expected that the PRES project would have an in-service date no later than December 31, 2022. Therefore, the PRES Project is a prescribed undertaking pursuant to GRR section 4(2). The PRES Project went into service in May 2021.

The PRES Project is currently in the Implementation Phase and has an estimated total cost of \$285 million. As of the end of fiscal 2021, BC Hydro has incurred \$206.2 million in total expenditures on developing the PRES Project, of which \$53.3 million was incurred in fiscal 2021.

During fiscal 2021, BC Hydro completed construction and commissioning at the South Bank Substation 230 kV switchyard. BC Hydro also completed construction of the two new transmission lines and started reclamation, remediation and slope stabilization work at locations along the transmission corridor.

Since the project was just recently placed in-service, BC Hydro expects to report on performance metrics and environmental benefits of undertaking the PRES Project in the next reporting period.

5.2.2 [REDACTED] Generation Agreement

As reported in the fiscal 2018 GRR Annual Report, BC Hydro entered into a Generation Agreement with Company X. The purpose of the Generation Agreement with Company X is to provide reliable electricity supply during periods of actual or anticipated system constraints. When Company X first interconnected to BC Hydro's transmission system, there was a known risk of area transmission system capacity constraints (thermal overload) on hot summer days. The Generation Agreement was

a lower-cost and more efficient demand side solution to mitigate the risk of thermal overload until the PRES Project was in-service.

Under the Generation Agreement, BC Hydro treats Company X's generation as a firm dispatchable system resource, such that any self-generated electricity temporarily replaces electricity that would otherwise be provided from the BC Hydro transmission system. BC Hydro has the right to direct Company X to temporarily island its facilities in Northeast B.C. from the grid and self-supply them with electricity produced by Company X's on-site generating units. BC Hydro also has the right for economic dispatch of these generating units during the Agreement term.

BC Hydro terminated its right to direct Company X to temporarily island its Project 4 facility effective December 31, 2020, but maintained the right to direct Company X to temporarily island its Project 3 facility until August 31, 2021 (at which point the Generation Agreement will automatically expire, unless extended by BC Hydro). The August 2021 termination date is aligned to the original expected PRES in-service date of October 2021 and the end of summer 2021. At this time, BC Hydro does not plan to seek an Agreement extension.

The total forecast nominal value of the Generation Agreement is \$12.0 million. Total expenditures incurred in fiscal 2021 with respect to this agreement are \$1.4 million.

5.3 Quantitative Data – Methodology & Assumptions

BC Hydro has developed criteria to qualify customer loads for inclusion in its estimates for GHG emissions reduced or avoided due to the PRES Project.

The customer load to be included:

- Must be a new natural gas processing plant (including associated gas gathering and wellpad facilities) or existing plant converting to take grid service which takes, or commits to take, electricity service from BC Hydro in fiscal 2018 or later;

- Would have used natural gas for power supply in the absence of BC Hydro’s commitment to construct and operate new facilities; and
- Will be served by the PRES Project once it is placed in-service.

These criteria include: (i) existing “brownfield” loads which fuel-switch from carbon-based fuel to grid electricity; and (ii) new “greenfield” loads that make the investment decision to take grid electricity as an alternative to carbon-based fuels for power supply.

BC Hydro notes that these criteria differ from the current British Columbia Greenhouse Gas Offset Protocol (*Fuel Switch Version 1.0, dated August 16, 2018*) which is specific to the replacement of existing gas-powered turbines with electrical grid power. Under the current protocol, GHG emission reductions would only arise where an existing customer facility fuel switches from a carbon-based fuel (such as natural gas) to low-carbon grid electricity and would not apply to any new plant that elects to be served with grid electricity in the first instance.

5.4 Performance Metrics

The GRR performance metrics for the PRES Project are listed in [Table 6](#) below.

Table 6 PRES Project: GRR Performance Metrics

Type of Facility	Project(s)	Performance Metrics
Transmission & Distribution	PRES Project	New load served GHG emissions reduction
Generation	Generation Agreement	New load served Mitigation of system constraints GHG emissions reduction

A key purpose of the PRES Project is to enable a clean, reliable source of electrical power supply to existing and new natural gas processing operations. In the absence of the PRES Project, there would be no electricity grid service alternative. These plant operations would otherwise need to use natural gas (or other fossil fuels) for

power supply. Since greenhouse gases are emitted when fossil fuels are burned to create power, the PRES Project will reduce GHG emissions in British Columbia for any existing plant that elects to take grid service rather than self-supply using natural gas.

GHG Emission Reduction Methodology

BC Hydro will estimate the impact the PRES Project will have on GHG emission reductions in British Columbia based on the assumptions and methodology set out in section 4.3 of this report. BC Hydro will apply these same assumptions and methodology to estimate the impact that [REDACTED] generation will have on GHG emission reductions in British Columbia until the PRES Project is in-service. For fiscal 2021 the GHG emissions intensity factors determined in accordance with this methodology are listed below for convenience:

- Average emissions intensity factor for natural gas turbine: [REDACTED]⁷;
- Less emissions intensity factor for BC Hydro grid electricity: [REDACTED]⁸; and [REDACTED]
- Net emissions intensity factor for electrified loads: [REDACTED]

Determination of Eligible Loads for GHG Emission Reduction

In fiscal 2019 and fiscal 2020, certain Company X facilities were electrified with the support provided through the Generation Agreement (to ensure reliable electricity supply) and the Incentive Agreement (to provide supporting funds for investment in electrical infrastructure) described in the previous sections. Absent these

⁷ The efficiency assumption of 29.5 per cent for gas turbines was developed by calculating the weighted average efficiency from metered data of two customer operated gas turbine electrical generation units.

⁸ Source: British Columbia Government: 2017 B.C. Best Practices Methodology for Quantifying Greenhouse Gas Emissions, page 17.

agreements, BC Hydro considers that the Company X loads would not have connected to the BC Hydro transmission system and taken grid service.

As discussed in section [4.2](#) above, Company X has two sites which are relevant to the prescribed undertakings, the [REDACTED] (Project 3) and the [REDACTED] (Project 4) sites.

The Project 3 site was energized from the BC Hydro transmission system in fiscal 2019. This site comprises three gas processing plants and one field/gathering system.

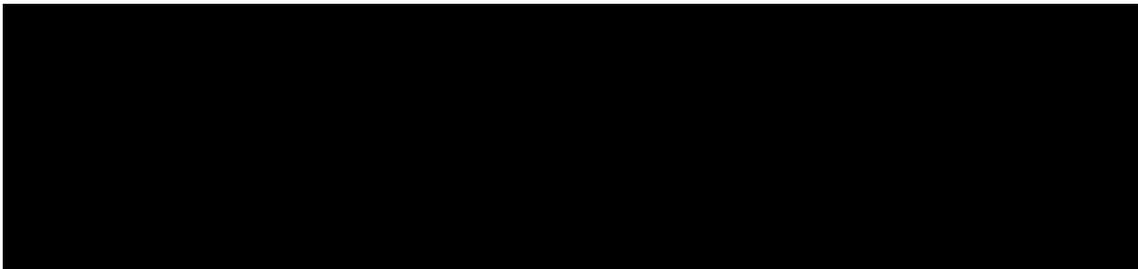
Of the three gas processing plants: one gas processing plant's (Gas Plant 1) load is not eligible for GHG emission calculation because it was previously served from the BC Hydro distribution system; one gas processing plant's (Gas Plant 2) load was new to the BC Hydro system in fiscal 2019; and the final gas processing plant has not yet been constructed.

The load associated with the field/gathering system is being phased into the BC Hydro system. One phase of the field/gathering system load was introduced to the BC Hydro system in fiscal 2019. Another phase of the field/gathering system load was new to the BC Hydro system in fiscal 2020. There were no new phases introduced to the BC Hydro system in fiscal 2021. Further phases of the field/gathering system are expected to join the system in future fiscal years.

For fiscal 2021, total Project 3 load served by BC Hydro was 127,481 MWh, with an estimated GHG emission reduction of 76,234 tonnes CO_{2e}.



The Project 4 site was energized from the BC Hydro transmission system in fiscal 2019. This site comprises two gas processing plants, one of which was operational in fiscal 2019 (Gas Plant 1), while the other was under construction (Gas Plant 2). Project 4's Gas Plant 2 is joining the BC Hydro system in phases. The first phase connected to the grid in fiscal 2020. No additional phases completed in fiscal 2021 due to project delays. For fiscal 2021, total Project 4 load served by BC Hydro was 162,143 MWh, with an estimated GHG emission reduction of 96,961 tonnes CO_{2e}.



BC Hydro notes that for each site, electrical energy consumption arising from the electrification of new loads is used to determine associated GHG emission reductions pursuant to the methodology described in section [4.3](#). These values have been incorporated into Summary of Results

5.4.1 Explanation of Terms

[Table 7](#) below includes a description of the information provided in the results table for LCE Infrastructure Projects. The reason for the indications of "n/a's" is due to the nature of the PRES Project as of March 31, 2021 as described above.

Table 7 LCE Infrastructure Projects Results
Table: Explanation of Terms

Column	Heading	Descriptions
A	Prescribed Undertaking	Type of prescribed undertaking.
B	Name	Project, program, or customer name.
C (i)	Actual (\$ million)	Actual costs in millions incurred at the end of the current reporting fiscal.
C (ii)	Cumulative Costs (\$ million)	Cumulative actual costs in millions incurred from first year of expenditure to the end of the current reporting fiscal.
C (iii)	Forecast Total (\$ million)	Approved Anticipated Total Capital Cost of Project.
D	Capacity of Facility (MW)	Planned facility capacity in megawatts at N-1 and N-0.
E	Total Capacity Committed/Secured (MW)	Cumulative total capacity committed and secured until the end of the current fiscal year in megawatts.
F	Total Customer Load(s) Served (MW)	Cumulative total customer loads served as at the end of the current fiscal year in megawatts.
G	Total Energy Provided to Customers (MW/h)	Cumulative total energy provided to customers as at the end of the current fiscal year in megawatts per hour.
H (i)	Actual: GHG Emissions Reduction Estimates (tonnes CO ₂ e/year)	Actual GHG Emissions Reduction at the end of the current fiscal period in tonnes of carbon dioxide equivalent per year.
H (ii)	Cumulative: GHG Emissions Reduction Estimates (tonnes CO ₂ e/year)	Cumulative GHG Emissions Reduction as at the end of the current fiscal period in tonnes of carbon dioxide equivalent per year.
I (i)	Type: Fossil Fuel(s) Avoided Or Displaced	Type of fossil fuels avoided or displaced or likely to be avoided or displaced.
I (ii)	Amount: Fossil Fuel(s) Avoided Or Displaced	Amount of fossil fuels avoided or displaced or likely to be avoided or displaced.

5.4.2 Results Table

[Table 8](#) below provides the results for LCE Infrastructure Projects with expenditures in fiscal 2021.

Table 8 LCE Infrastructure Projects Results for Year Ending March 31, 2021

	A	B	C			D	E	F	G	H		I	
	Prescribed Undertaking	Name	Cost			Capacity of Facility (MW)	Total Capacity Committed/ Secured (MW)	Total Customer Load(s) Served (MW)	Total Energy ¹ Provided to Customers (MW/h)	GHG Emissions Reduction Estimates ² (tonnes CO _{2e} /year)		Fossil Fuel(s) Avoided or Displaced	
			Actual (\$ million) (i)	Cumulative (\$ million) (ii) ³	Forecast Total (\$ million) (iii)					Actual (i)	Cumulative (ii)	Type (i)	Amount (ii)
1	T&D	PRES Project	53.3	206.2	285	800 - 950	24	n/a	n/a	n/a	n/a	n/a	n/a
2	Generation	(Company X)	1.4	4.7	12	24	24	38	289,624	173,195	411,763	n/a	n/a

¹ Reflects total new facility load served from the BC Hydro transmission system in fiscal 2021. 164,533 MWh of load is from existing brownfield facilities that fuel-switched to grid power. 125,091 MWh of load is from new greenfield facilities that electrified.

² The GHG Emissions Reduction Estimates are specific to eligible Project 3 and Project 4 plant loads that were served by BC Hydro in fiscal 2021 in place of natural gas-fired supply.

³ An additional expenditure of \$0.3 million was incurred for generation dispatched as an energy resource over 11 days in March 2019. BC Hydro does not consider the associated dispatch costs to be reportable GGRR costs because they were incurred for a purpose ancillary to providing reliable network service.

6 Electric Vehicles Fast Charging Stations Program

6.1 Overview

BC Hydro constructed and operated EV fast charging stations prior to the enactment of section 5 of the GGRR, commencing with the installation of the first charging station in 2013. During the Reporting Period from April 1, 2020 to March 31, 2021, BC Hydro constructed and commissioned EV fast charging stations at five new eligible charging sites. Two EV fast charging stations were installed at four of these sites, and one station was installed at the remaining site. In addition, one additional EV fast charging station was added to each of the 10 existing single station sites. As of March 31, 2021, BC Hydro has 97 EV fast charging stations in operation at 71 sites across the province.

As indicated in Appendix 1 to Attachment 2, all of BC Hydro's fast charging stations meet the requirements of section 5 of the GGRR. That is, all:

- Are available to the public 24 hours a day;
- Do not require users to be a member of a charging network to initiate a charging session;
- Are capable of charging electric vehicles of more than one make; and
- Would be put into operation prior to December 31, 2025;

In addition, as set out in [Table 9](#) below, for those charging stations that are located in a limited municipality, the number of eligible charging sites within the limited municipality did not exceed the site limit in that municipality on the date the charging station was put into operation.

**Table 9 Eligible Fast Charging Stations
Added - Fiscal 2021**

Location/Site	In-Service Date	Number of New EV Fast Charging Sites	Number of EV Fast Charging Stations
Port Alberni (Expansion)	16-April-2020	0	1
Chilliwack (Expansion)	8-Jun-2020	0	1
Campbell River (Expansion)	12-Jun-2020	0	1
Courtenay (Expansion)	12-Jun-2020	0	1
Port McNeill	12-Jul-2020	1	1
Coquitlam - Superstore West (Expansion)	17-Sep-2020	0	1
Grandview Hwy - Superstore (Expansion)	21-Sep-2020	0	1
Prince George	14-Dec-2020	1	2
Burns Lake	15-Dec-2020	1	2
Prince Rupert	15-Dec-2020	1	2
Victoria	23-Mar-2021	1	2
Sechelt (Expansion)	22-Feb-2021	0	1
Surrey - Cloverdale (Expansion)	2-Feb-2021	0	1
UBC - Wesbrook Place (Expansion)	18-Dec-2020	0	1
Vancouver - Kerrisdale (Expansion)	31-Mar-2021	0	1
Total		5	19

During the Reporting Period, BC Hydro decommissioned three of its EV fast charging sites. These sites are identified in [Table 10](#) below, along with the date of decommissioning as well as the reason the site was decommissioned.

**Table 10 Fast Charging Stations
 Decommissioned - Fiscal 2021**

Date of Decommissioning	Site	Reasons for Decommission
Sep 30, 2020	Surrey Central City Hall	Decommissioned since the fast charging station relied on electrical infrastructure that was inside the site host's premises with restricted access.
Oct 1, 2020	Penticton	Decommissioned and re-opened by FortisBC Inc. due to its proximity to FortisBC's network.
Mar 31, 2021	Powertech Labs	Decommissioned due to non-compliance with requirements of the GGRR, and a new station planned at a site nearby Powertech Labs.

6.2 Compliance Verification

The following is an account of the processes for each compliance item:

- **Availability to the public for 24 hours** – All new charging station sites are selected based on the requirement for 24-hour access. If the 24 hour access for a site changes for any reason, BC Hydro will work with the site owner to re-instate 24 hour access or make a decision to decommission the station at the site. For example, BC Hydro negotiated with the Township of Langley to reconfigure the parking lot gates to maintain 24-hour access for the charging station at the Langley Event Centre while closing off the rest of the parking lot after hours;
- **No requirement of membership** - BC Hydro offers a one-time credit card payment service that is free of any network membership requirements. Customers use their smart phone to scan a QR code that takes them to a web portal to process a credit card payment for the charging session;
- **Capability to charge more than one vehicle make** - All BC Hydro's direct current, fast charging stations can charge all EV models from manufacturers

that subscribe to the two industry open standards for charger/car interface – CHAdeMO and CCS; and

- **Decision to Construct or Purchase** - For BC Hydro, “the date the public utility decides to construct or purchase an eligible charging station” is the date when the expenditures associated with the construction or purchase of the eligible charging station are internally approved via an Expenditure Authorization Request (EAR). BC Hydro considers the date when the appropriate approval of the EAR is obtained that it has met the requirement of section 5(2)(b) of the GGRR.
- **Site Limit** – BC Hydro determines the Site Limit for each proposed charging station based on the most recent population numbers published by BC Stats.

6.3 Summary of Results

Appendix 1 to Attachment 2 identifies each of BC Hydro’s 97 eligible charging stations at 71 eligible charging sites as of March 31, 2021. All sites are delineated in the Economic Development Region.

For all eligible charging stations identified in Appendix 1 to Attachment 2, a charging port for BC Hydro at this time is the same as a charging station. That is, each charging station is capable of charging one vehicle at a time, even though each of the 97 charging stations is equipped with two connectors - a CHAdeMO connector and a SAE CCS connector.

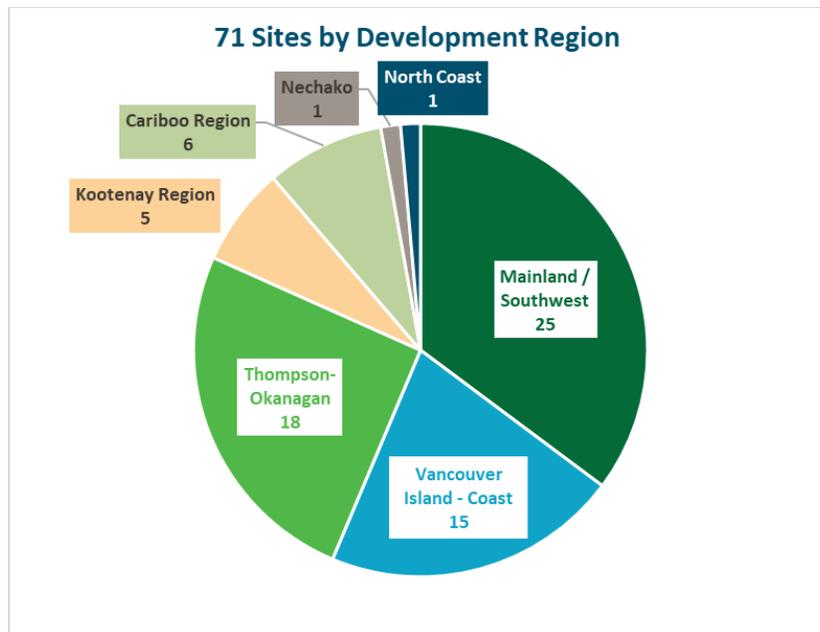
The number of charging sessions as well as kWh dispensed (measured by metering currently not yet approved by Measurement Canada) during fiscal 2021 for each eligible charging station is provided in Appendix 1 to Attachment 2.

For most of the sites identified in Appendix 1 to Attachment 2, population statistics are based on the 2016 Census as reported for the year 2020 by BC Stats. In some instances and as identified, the population figures are from the 2016 Census as

reported by Statistics Canada. The number of eligible charging stations within each limited municipality as of March 31, 2021 is based on a review of information in Plugshare.com.

The distribution of fast charging sites by Economic Development Region is provided in [Figure 3](#) below.

Figure 3 **Distribution of Eligible Charging Sites by Economic Development Region**



**Greenhouse Gas Reduction (Clean Energy)
Regulation Reporting**

**Attachment 2
Fiscal 2021 Annual Report No. 4
April 2020 to March 2021**

**Appendix 1
Electric Vehicle Fast Charging Station Program
Information as of March 31, 2021**

PUBLIC

REFER TO LIVE SPREADSHEET MODEL

Provided in electronic format only

(Accessible by opening the Attachments Tab in Adobe)

**Greenhouse Gas Reduction (Clean Energy)
Regulation Reporting**

Attachment 3

**Annual Expenditures in Total
and by Project/Study/Program**

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