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June 30, 2023

GHG Reduction (Clean Energy) Regulation  
Reporting  
Director, Clean Transportation Branch  
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British Columbia Utilities Commission  
GHG Reduction (Clean Energy) Regulation  
Reporting

Email: [commission.secretary@bcuc.com](mailto: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  
PUBLIC Fiscal 2023 Annual Report**

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BC Hydro writes to submit the Business Information and Declaration (Attachment 1), the Fiscal 2023 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, 2022, to March 31, 2023 (**Fiscal 2023**) 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 20, 2023, BC Hydro received from the MEMLCI an updated reporting template for the period from April 1, 2022, to March 31, 2023, for prescribed undertakings under the GGRR. This report contains information that reflects this updated template.

On June 27, 2022, the Government of British Columbia issued the Direction to the British Columbia Utilities Commission Respecting Load Attraction and Low-Carbon Electrification (the **Electrification Plan Regulation**). As further explained in the GGRR Report, in fiscal 2023, BC Hydro continued to carry out Low-Carbon Electrification (**LCE**) infrastructure projects as a "prescribed undertaking" under section 4(2) of GGRR; however, most of its LCE activities/programs that would have been "prescribed undertakings" under section 4(3) of the GGRR are now carried out as LCE programs defined under the Electrification Plan Regulation. Accordingly, the expenditures for the LCE programs that are carried out as defined under the Electrification Plan Regulation are not part of this report. BC Hydro will be reporting aspects of its Electrification Plan,

June 30, 2023

Ministry of Energy, Mines and Low Carbon Innovation (MEMLCI or Ministry)  
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including LCE programs defined under the Electrification Plan Regulation, in its next Revenue Requirements Application as required by Directive 6 of the British Columbia Utilities Commission (**BCUC**) Decision and Order G-91-23 relating to BC Hydro's Fiscal 2023 to Fiscal 2025 Revenue Requirements Application.

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 our customers.

For further information, please contact the undersigned at [bchydroregulatorygroup@bchydro.com](mailto:bchydroregulatorygroup@bchydro.com).

Yours sincerely,



Chris Sandve  
Chief Regulatory Officer

st/rh

Enclosure

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

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**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 Email: <a href="mailto:bchydroregulatorygroup@bchydro.com">bchydroregulatorygroup@bchydro.com</a>	604-623-3726
Reporting Period:	April 1, 2022 to March 31, 2023 (Fiscal 2023)	
<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 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	2023/06/30

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

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**Attachment 2**

**Fiscal 2023 Annual Report No. 6  
April 2022 to March 2023**

**PUBLIC**

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## 1 Executive Summary

This is BC Hydro's sixth 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 2023 "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 (**the Ministry**).

This report covers the annual period from April 1, 2022 to March 31, 2023 (**Fiscal 2023 or Reporting Period**) and BC Hydro's prescribed undertakings under the GGRR in the following 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.

On June 27, 2022, the Government of British Columbia issued the Direction to the British Columbia Utilities Commission Respecting Load Attraction and Low-Carbon Electrification (BC Reg. 156/2022) (the "Electrification Plan Regulation"). The Electrification Plan Regulation defines the low-carbon electrification program and sets out the recovery mechanism of costs for the low-carbon electrification program as defined. More specifically, under the Electrification Plan Regulation, BC Hydro can defer to the DSM regulatory account up to \$193.7 million in costs incurred during the period beginning April 1, 2021, and ending March 31, 2027, to provide the low-carbon electrification program.

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All BC Hydro's low-carbon electrification activities during this Reporting Period are programs defined under the Electrification Plan Regulation<sup>1</sup> with the exception of \$0.38 million in fiscal 2023, which relates to LCE incentives for two industrial projects. These industrial project LCE incentives are a prescribed undertaking under section 4(3)(a) of the GGRR, further described in section [4.2](#) below. Costs associated with the Electrification Plan and prescribed undertakings are deferred to the DSM Regulatory Account.

BC Hydro is closing the Peace Region Electricity Supply (**PRES**) Project, which is a LCE Infrastructure Project undertaking under section 4(2) of the GGRR. The PRES Project was placed in-service in fiscal 2022 (May 2021) and the majority of the reclamation and remediation work was completed in fiscal 2023. In fiscal 2023, actual expenditure on the PRES Project was \$2.3 million, with a cumulative cost of \$221.0 million as of the end of fiscal 2023. An estimated 159,208 tonnes of GHG emissions were avoided since the PRES Project was placed in-service. No expenditures were incurred in fiscal 2023 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]. [REDACTED]. This is also an LCE Infrastructure Project undertaking under section 4(2) of the GGRR.

During the Reporting Period, BC Hydro continued to construct and operate EV fast charging stations which are prescribed undertakings under section 5 of the GGRR by adding seven new eligible charging sites to its network of EV fast charging stations. All of these new sites were constructed with two fast charging stations each. In addition, 18 existing eligible charging sites with a single fast charging

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<sup>1</sup> BC Hydro will report on low-carbon electrification programs under the Electrification Plan Regulation to the BCUC pursuant to Directive 6 of Order G-91-23 relating to BC Hydro's F2023 to F2025 Revenue Requirement Application.

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station were expanded adding an additional fast charging station. At the end of the Reporting Period, there were 141 eligible charging stations at 83 eligible charging sites in BC Hydro's EV 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 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 undertakings.

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 as prescribed undertakings.<sup>2</sup> Together, CEA section 18 and the GRR provide one of the statutory pillars of the Government of B.C.'s GHG emission reduction policy.

One of the legal consequences of the public utility program or project being a "prescribed undertaking" under the GRR 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

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<sup>2</sup> The GRR was further amended, and these amendments are not particularly relevant to this report.

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utility. Accordingly, the prescribed undertakings described in this fiscal 2023 GGRR Annual Report are those programs and projects with recorded costs in fiscal 2023.<sup>3</sup>

Pursuant to BCUC Order No. 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 2022 are deferred to the Electric Vehicle Costs Regulatory Account. As part of the BCUC's decision on BC Hydro's Fiscal 2023 to Fiscal 2025 Revenue Requirements Application, BC Hydro was directed to:

Commencing in F2023, and until directed otherwise by the BCUC, defer the actual revenue, including the Low Carbon Fuel Credits revenue, and costs related to its EV fast charging service, including finance costs associated with the EV fast charging capital assets, to the EV Costs Regulatory Account.

### **3 State of the Market and Program Planning**

#### **3.1 Background**

In December 2018, the Government of B.C. launched the CleanBC Plan, which set out a pathway to enable the Government of B.C. 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.

In the June 2021 Minister's Mandate Letter to BC Hydro, the Ministry set out expectations for BC Hydro to make substantive progress on certain priorities, including "provid[ing] leadership in advancing CleanBC's climate and economic development objectives, including electrification, fuel switching, and energy

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<sup>3</sup> 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 Direction to the British Columbia Utilities Commission Respecting Undertaking Costs, issued March 1, 2017. Generally, the costs BC Hydro incurs in regard to its LCE infrastructure projects are capitalized.

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efficiency initiatives in the built environment, transportation, oil and gas, and other sectors.” The Ministry also expected BC Hydro to “develop a short-term electrification plan that builds on the key results of the Comprehensive Review of BC Hydro and supports CleanBC,” such as “Expanding BC Hydro’s network of electric vehicle DC fast-charging stations”.

In fiscal 2022, BC Hydro developed the Electrification Plan<sup>4</sup> and began to advance some of the actions included therein. The Electrification Plan describes BC Hydro’s actions (as well some of the government programs) that include supporting customer fuel switching over a five-year period starting in fiscal 2022.

The December 2022 Mandate Letter for the Minister of Energy, Mines and Low Carbon Innovation outlines the importance of continuing to work with BC Hydro to implement the Electrification Plan.<sup>5</sup>

### **3.2 State of the Market Discussion**

This section presents an overview of the LCE market with respect to BC Hydro’s activities leading up to fiscal 2023. 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 LCE 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:

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<sup>4</sup> BC Hydro’s electric vehicle infrastructure Five-Year Plan – 2025 is available at: <https://www.bchydro.com/about/strategies-plans-regulatory/supply-operations/electrification-plan.html>.

<sup>5</sup> For clarity, BC Hydro’s low-carbon electrification activities during this Reporting Period that were formally planned as activities under the GGRR were undertaken as activities defined under the Electrification Plan Regulation. With one exception being \$0.38 million that relates to LCE incentives for two industrial projects which are a prescribed undertaking under section 4(3)(a) of the GGRR,

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- 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 GGRR Annual Report filed in July 2018 have been updated in subsequent reports as expenditures were incurred related to those projects. They are also included in [Table 2](#) of 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 Government of B.C.'s programs and is generally referred to as the BC Hydro LCE Program. The BC Hydro LCE Program is further described in section [4](#) below.

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 2023, BC Hydro did not hold any call processes in regard to its LCE Programs or its LCE Infrastructure Projects.<sup>6</sup> Therefore, no Fairness Advisor report is required.<sup>7</sup>

For public EV charging service, charging stations are moving towards a variety of power levels based on customer desired charging time and vehicle battery size. In instances where shorter charging time is required and to accommodate larger

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<sup>6</sup> BC Hydro uses a range of procurement methods to meet our needs, and details of these methods are described in detail at: <https://www.bchydro.com/work-with-us/suppliers/doing-business-with-bchydro.html>.

<sup>7</sup> BC Hydro issued a direct award for the PRES Project for deficiency works as per the BC Hydro procurement methods.

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vehicle batteries (such as pickup trucks), BC Hydro plans to deploy 180 kW fast charging stations in fiscal 2024.

### **3.3 Government of B.C. Programs**

In fiscal 2019, BC Hydro became responsible for delivering offers within the CleanBC Better Buildings program on behalf of the Government of B.C. The program, which was initially called EfficiencyBC with funding provided by the federal and provincial government, is now named the CleanBC Better Buildings and CleanBC Better Homes programs. These programs are funded by the provincial government and provide 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 currently delivering the components of the CleanBC Better Buildings and Better Homes programs on behalf of the Government of B.C. that helps customers switch from fossil fuels to clean electricity.

In fiscal 2020, BC Hydro became responsible for delivering the Government of B.C.'s Go Electric 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 and workplaces seeking solutions for their EV charging needs. The government program influences what programs BC Hydro funds as it seeks to align with and complement the programs and projects funded by the Government of B.C. BC Hydro's programs that complement the provincial CleanBC programs are discussed in section [4](#) below.

In fiscal 2021, the Government of B.C. 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

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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 GHG emissions in their existing commercial buildings. The program targets simple, smaller electrification opportunities across commercial and institutional buildings.

### **3.4 Electric Vehicle Charging Stations**

At the beginning of fiscal 2023, BC Hydro had 112 fast charging stations in operation at 78 sites across the province. At the end of fiscal 2023, BC Hydro had 141 eligible fast charging stations in operation at 83 sites. During fiscal 2023, BC Hydro continued to build out its EV charging network, by deploying 32 eligible fast charging stations. Fourteen of these fast-charging stations were at seven new sites, and 18 new fast charging stations were added to existing sites that had a single EV fast charging station. Three sites, each with one fast charging station, were removed from the BC Hydro network; the ownership of two sites was transferred to FortisBC, and one site was decommissioned. All of BC Hydro's EV charging stations deployed in this Reporting Period are in compliance with requirements of section 5 of the GGRR, as further discussed in section [6](#) below.

In January 2022, BC Hydro released “BC Hydro’s electric vehicle infrastructure Five-Year Plan – 2025”.<sup>8</sup> The Plan covers fiscal 2022 to fiscal 2026 and targets 145 sites and 325 stations by December 2025. In addition to the targeted sites and stations, the Plan targets province-wide coverage by summer 2024.

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<sup>8</sup> BC Hydro's electric vehicle infrastructure Five-Year Plan – 2025 is available at: <https://www.bchydro.com/powersmart/electric-vehicles/industry/charging-network-planning.html>.

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## 4 LCE Programs

### 4.1 Overview

There are eight 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;<sup>9</sup> and (ii) those that are infrastructure based.<sup>10</sup> 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 6.8 of the GGRR Reporting Requirements, and "Transmission, Distribution and Generation" referred to in subsection 6.9 of the GGRR Reporting Requirements, respectively.

As discussed above in section 3.3, BC Hydro has delivered the CleanBC Better Buildings and CleanBC Better Homes programs on behalf of the Government of B.C. since fiscal 2019. In fiscal 2019, to complement the Government of B.C.'s programs, BC Hydro developed and advanced a multi-year BC Hydro funded LCE Program to reach customers and to enable opportunities not covered by greenhouse gas emissions reduction programs funded by the Government of B.C. or the federal government,<sup>11</sup> focusing on opportunities in industrial process, transportation, and new construction.

In fiscal 2020, the Government of B.C., working in co-ordination with BC Hydro, decided to add a CleanBC program for new construction. The introduction of this

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<sup>9</sup> 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.

<sup>10</sup> Being the classes of undertaking prescribed by subsections 4(2) and 4(3)(e) of the GGRR.

<sup>11</sup> This multi-year program is also referred to as the "BC Hydro LCE Program" to distinguish it from the programs funded by the Government of B.C.

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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 LCE Program, BC Hydro undertook activities as prescribed undertakings under section 4(3)(a), section 4(3)(b), and section 4(3)(d) of the GRR.

Prior to this Reporting Period and as reported in previous reports, BC Hydro's activities in the LCE Program were "prescribed undertaking" as set out in section 4 of the GRR. Subsequent to the issuance of the Electrification Plan Regulation in June 2022, all of BC Hydro's low-carbon electrification activities in this Reporting Period were undertaken as low-carbon programs defined in the Electrification Plan Regulation and the associated costs will be recovered in accordance with the mechanism set out in the Regulation, with the exception of 0.38 million in fiscal 2023 which relates to LCE incentives for industrial projects (Project 3 and 4 as discussed below). Any low-carbon programs defined under the Electrification Plan Regulation are not prescribed undertakings under the GRR and not reported in the GRR Annual Report. BC Hydro will report to the BCUC its Electrification Plan programs, including low-carbon electrification programs, in accordance with Directive 6 of Order G-91-23.

## **4.2 Fiscal 2023 LCE Programs**

In fiscal 2023, BC Hydro spent a net amount of \$0.38 million related to low-carbon electrification incentives for two industrial projects. These incentives are for two multiphase projects which were introduced as Initial LCE Projects in the GRR Annual Report filed in July 2018 and have been updated in subsequent reports as

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expenditures were incurred. These were undertaken as a prescribed undertaking under section 4(3)(a) of the GGRR.

Consistent with the Reporting Requirements, two larger upstream natural gas projects have been described at a project level.

██ (Project 3 in [Table 2](#)): This project is interconnected to BC Hydro transmission line ██████████ 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**)<sup>12</sup> in fiscal 2019 and fiscal 2020, respectively, pursuant to the terms of the LCE Incentive Agreement for the project. A third phase of this project was originally planned for fiscal 2021 but the phase shifted to fiscal 2023 and is now complete. An expenditure of \$1.31 million was made for this phase in fiscal 2023. This payment was partially offset by a carbon offset reimbursement from the customer to BC Hydro of \$0.36 million. The net result being a payment of \$0.95 million to the customer (shown in Row 5 of Table 5). A further project phase is expected to achieve Facility COD in fiscal 2026.

██ (Project 4 in [Table 2](#)): BC Hydro has an LCE Incentive Agreement for the ██████████ site. This project is interconnected to BC Hydro transmission line ██████████ 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

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<sup>12</sup> Under the Incentive Agreement, Facility COD is required before an incentive fund payment can be made to the customer.

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accordance with the LCE Incentive Agreement. A third phase achieved Facility COD in fiscal 2022. BC Hydro was re-imbursed \$0.15 million based on project measurement and verification results. Additionally, BC Hydro received a payment of \$0.41 million for carbon offsets from the customer. The net result being a payment to BC Hydro of \$0.57 million (shown in Row 6 of 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 GHG 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

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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 2](#). 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 2](#). 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.

#### **4.4 Performance Metrics**

Performance measurement for BC Hydro's 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 GHG emissions.

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Performance measured using the measurement and verification methodologies described in section [4.3](#), provides a view of electrical consumption, demand, and GHG emission reductions.

## **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. The cost effectiveness calculation for the purposes of section 4(4) of the GGRR is done by calculating the present value of the benefits and costs of all the undertakings meeting the criteria of either section 4(3)(a) or section 4(3)(b), using a discount rate equal to BC Hydro's weighted average cost of capital over a period that ends no later than a specified year. The GGRR cost-effectiveness test is measured only at the time BC Hydro decides to carry out the program.

[Table 2](#) shows the GGRR net present value (**NPV**) of the various LCE projects or programs meeting the requirements of section 4(3)(a) and 4(3)(b) of the GGRR. The total GGRR NPV of these undertakings is \$106.5 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 1](#) below includes a description of the information provided in [Table 2](#) with regard to the LCE Programs.

**Table 1 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 GHG emissions.
C <sup>(i)</sup>	Actual Expenditure (\$ million)	Costs incurred at the end of the current reporting fiscal year.
C <sup>(ii)</sup>	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 <b>weighted average cost of capital</b> . 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 <sup>(i)</sup>	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 <sup>(ii)</sup>	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 <sup>(i)</sup>	Actual: Additional Capacity Demand (MW)	The total energy demand added.
G <sup>(ii)</sup>	Cumulative: Additional Capacity Demand (MW)	The sum of the successive energy demand addition.
H <sup>(i)</sup>	Actual: Estimated GHG Emission Reductions (tonnes CO <sub>2</sub> e/year)	The average annual tonnes per year of carbon dioxide equivalent reductions from the project in the current reporting fiscal period.
H <sup>(ii)</sup>	Cumulative: Estimated GHG Emission Reductions (tonnes CO <sub>2</sub> 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 2](#) below summarizes information regarding the LCE Programs that are prescribed undertakings under 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. Attachment 3 provides an excel spreadsheet with annual expenditures, in total and by project, study, or program, as outlined in the GGRR Reporting Requirements.

The Reporting Requirements also request graphical depictions (e.g., pie charts or bar charts) of the distribution by region in the Government of B.C. and the distribution by customer sector where possible. In fiscal 2023, BC Hydro undertook a single project as a prescribed undertaking under the GGRR. Accordingly, BC Hydro determined that a graphical depiction would not be meaningful to include in this report.

**Table 2 LCE Programs Results for Year Ending March 31, 2023**

	A	B		Start Date <sup>ii</sup>	C		D		E		F		G		H	
					Expenditure (\$ million)		Cost Effectiveness (F2018\$ million)		Additional Energy Consumption <sup>iii</sup> (MWh/year)		Additional Demand (MW)		Estimated GHG Emission Reductions (tonnes CO <sub>2</sub> e/year)			
		Project / Program / Contract / Expenditure <sup>i</sup>	Municipality / Location		Actual F2023 (i)	Cuml. F2018-F2023(ii)	NPV to 2030 (F2031)	GGRR NPV to 2030 (F2031)	Actual F2023 (i)	Cuml. F2018-F2023 (ii)	Actual F2023 (i)	Cuml. F2018-F2023 (ii)	Actual F2023 (i)	Cuml. F2018-F2023 (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) <sup>iv</sup>	[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) <sup>4</sup>	[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) <sup>v</sup>	[REDACTED]	Fiscal 2018	0.95	8.88	64.3	64.3	26,061	156,366	3.5	21.0	15,582	93,493		
6	4(3)(a)	[REDACTED] (Project 4) <sup>vi</sup>	[REDACTED]	Fiscal 2018	-0.57	10.85	45.9	110.2	-20,506	187,982	-2.8	25.2	-12,261	112,397		
7	4(3)(a)	Thompson Rivers University	Kamloops	Fiscal 2018	0.00	0.21	0.3	110.5	0	1,129	0.0	0.6	0	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 <sup>vii,viii,ix</sup>	Province-wide	Fiscal 2019	0.00	6.33	-4.0	106.5	0	6,145	0.0	1.1	0	3,995		
11	4(3)(c)	BC Hydro LCE Program <sup>8</sup>	Province-wide	Fiscal 2019	0.00	0.44	0.0	106.5	0	0	0.0	0.0	0	0		
12	4(3)(d)	BC Hydro LCE Program <sup>8</sup>	Province-wide	Fiscal 2019	0.00	1.44	0.0	106.5	0	0	0.0	0.0	0	0		
		Total			0.38	28.92	106.5	106.5	5,555	352,876	0.7	48.8	3,321	210,329		

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- i 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.
  - ii The Start Date is the fiscal year that BC Hydro decided to proceed with the project or program.
  - iii Values reported in column F represent the 'run rate' or annualized rate of additional energy consumption.
  - iv Projects 1 and 2 were described in the fiscal 2018 Annual Report filed in July 2018.
  - v Fiscal 2023 expenditures for Project 3 represent a payment to BC Hydro for offsets sold in Fiscal 2022 offset by actual expenditures. An adjustment has been made to the Project 3 cumulative expenditure to remove a reimbursement that should have been attributed to Project 4 in Fiscal 2022.
  - vi Fiscal 2023 expenditures for Project 4 represent a payment to BC Hydro for offsets sold in Fiscal 2022 and a reimbursement for underperformance in Fiscal 2022. An adjustment has been made to the Project 4 cumulative expenditure to include a reimbursement that was attributed to Project 3 in Fiscal 2022.
  - vii An adjustment has been made to the BC Hydro LCE Program cumulative energy, demand and GHG emission reduction to include a project that was omitted in previous reporting.
  - viii BC Hydro notes that the costs it incurs with regard to the BC Hydro LCE Program up to April 1, 2021 are carried out as prescribed undertakings and all costs after this date are carried out as part of the LCE programs described in the Electrification Plan Regulation. Subsequently, will be reported as outlined in Directive 6 by the BCUC in their Decision and Order G-91-23
  - ix The BC Hydro LCE Program NPV to 2030 (Fiscal 2031) in row 10 represents project and program costs carried out as prescribed undertakings under the GRR. A number of projects that were previously reported in this NPV, are now carried out within the Electrification Plan and are no longer reported as prescribed undertakings under the GRR. The projects remaining in the NPV are cost effective individually, but the NPV is negative because they do not provide enough benefits to offset the remaining fixed program costs.

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## **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 under subsections 4(2) or 4(3)(e) of the GGRR) and available evaluation results.

Northeast B.C. 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 2023 LCE Infrastructure Projects**

In fiscal 2023, BC Hydro incurred expenditures of \$2.3 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 will reduce GHG

emissions in B.C. from existing natural gas plants or from any prospective new natural gas plants 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 GGRR section 4(2).

During fiscal 2023, BC Hydro addressed construction deficiencies and continued reclamation, remediation and slope stabilization work at locations along the transmission corridor. As of the end of fiscal 2023, BC Hydro has incurred \$221.0 million in total expenditures on developing the PRES Project, of which \$2.3 million was incurred in fiscal 2023.

The PRES Project has resulted in an estimated 159,208 tonnes of avoided GHG emissions between April 2022 and March 2023.

### **5.2.2 [REDACTED] Generation Agreement**

As reported in the fiscal 2018 GGRR 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

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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 automatically expired. The August 2021 termination date is aligned to the original expected PRES Project in-service date of October 2021 and the end of summer 2021.

The actual total cost of the Generation Agreement is \$5.5 million, and no expenditures were incurred in fiscal 2023 with respect to this agreement.

### **5.3 Quantitative Data – Methodology and 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 3](#) below.

**Table 3 PRES Project: GRR Performance Metrics**

Type of Facility	Project(s)	Performance Metrics
Transmission & Distribution	PRES Project	<ul style="list-style-type: none"> <li>• New load served</li> <li>• GHG emissions reduction</li> </ul>
Generation	Generation Agreement	<ul style="list-style-type: none"> <li>• New load served</li> <li>• Mitigation of system constraints</li> <li>• GHG emissions reduction</li> </ul>

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

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### ***GHG Emission Reduction Methodology***

BC Hydro estimated the impact the PRES Project had on GHG emission reductions in B.C. 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 had on GHG emission reductions in B.C. for the period of fiscal 2022 that the PRES project was not 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],<sup>13</sup>
- Less emissions intensity factor for BC Hydro grid electricity: [REDACTED],<sup>14</sup>  
and
- 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 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.

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<sup>13</sup> The efficiency assumption of 29.5% for gas turbines was developed by calculating the weighted average efficiency from metered data of two customer operated gas turbine electrical generation units.

<sup>14</sup> Source: British Columbia Government: 2017 B.C. Best Practices Methodology for Quantifying Greenhouse Gas Emissions, page 17.

The Project 3 site was energized from the BC Hydro transmission system in fiscal 2019. This site comprises a gas processing plant which is being developed in three phases 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 or fiscal 2022. Further phases of the field/gathering system are expected to join the system in future fiscal years.

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.

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 4](#) 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 4      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 <sub>2</sub> 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 <sub>2</sub> 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 5](#) below provides the results for LCE Infrastructure Projects with expenditures in fiscal 2023.

**Table 5 LCE Infrastructure Projects Results for Year Ending March 31, 2023**

	A	B	C			D	E	F	G	H		I	
	Prescribed Undertaking	Name	Cost			Capacity of Facility (MW)	Total Capacity Committed/ Secured (MW)	Total Transmission Customer Load(s) Served (MW)	Total Energy Provided to Customers (MWh)	GHG Emissions Reduction Estimates (tonnes CO <sub>2</sub> e/ year)		Fossil Fuel(s) Avoided or Displaced	
			Actual (\$ million) (i)	Cumulative (\$ million) (ii) <sup>2</sup>	Forecast Total (\$ million) (iii)					Actual (i)	Cumulative (ii)	Type (i)	Amount (ii)
1	T&D	PRES Project	2.3	221.0	223.1	800 - 950	49.5	39.6	200,537	120,098	159,208	n/a	n/a
2	Generation	(Company X)	0.0	5.5	5.5	67.6	67.6	48.2	383,307	229,556 <sup>1</sup>	840,742 <sup>1</sup>	n/a	n/a

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

2. 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.

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## 6 Electric Vehicles Fast Charging Stations Program

### 6.1 Overview

BC Hydro constructed and operated EV fast charging stations<sup>15</sup> 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, 2022 to March 31, 2023, BC Hydro constructed and commissioned EV fast charging stations at seven new eligible charging sites. Two EV fast charging stations were installed at each of the new sites. In addition, 18 additional EV fast charging stations were added to existing sites. As of March 31, 2023, BC Hydro has 141 EV fast charging stations in operation at 83 sites across the province.

All of BC Hydro's fast charging stations meet the requirements of section 5 of the GGRR.<sup>16</sup> 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.

For stations installed after January 1, 2022, they all use or are configured to use Open Charge Point Protocol (**OCPP**).

In addition, as set out in [Table 6](#) below, for those charging stations newly in-service in fiscal 2023, either the site limit is not applicable because the stations are not

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<sup>15</sup> Fast charging station is a defined under the GGRR and BC Hydro uses the term consistent with the definition.

<sup>16</sup> The requirements for an EV charging station to be a prescribed undertaking under the GGRR are amended on May 19, 2023. Those amendments have no impact for this Reporting Period.

located in a limited municipality, or 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 6      Eligible Fast Charging Stations  
Added - Fiscal 2023**

Location/Site	In-Service Date	Number of New EV Fast Charging Sites	Number of EV Fast Charging Stations	Limited Municipality?
Cherryville	02-Feb-2023	1	2	No
Duncan Co-Op	23-Sep-2022	1	2	No
Fauquier	02-Feb-2023	1	2	No
Kitimat	20-Dec-2022	1	2	No
McLeod Lake	17-Sep-2022	1	2	No
New Denver	18-Nov-2022	1	2	No
Sayward	14-Dec-2022	1	2	No
70 Mile House	29-Dec-2022	0	1	No – expansion of existing site
Blue River	16-Dec-2022	0	1	No – expansion of existing site
Cache Creek	29-Dec-2022	0	1	No – expansion of existing site
Clinton	15-Dec-2022	0	1	No – expansion of existing site
Hixon	25-Nov-2022	0	1	No – expansion of existing site
Langley, District Municipality	31-Mar-2023	0	1	Yes – expansion of existing site
McBride	17-Oct-2022	0	1	No – expansion of existing site
Merritt	28-Feb-2023	0	1	No – expansion of existing site
Mission	16-Feb-2023	0	1	Yes – expansion of existing site
Port McNeill	23-Mar-2023	0	1	No – expansion of existing site
Powell River	02-Feb-2023	0	1	Yes – expansion of existing site
Quesnel	21-Nov-2022	0	1	Yes – expansion of existing site
Sechelt District Municipality	31-Mar-2023	0	1	Yes – expansion of existing site
Surrey	29-Mar-2023	0	1	Yes – expansion of existing site
Ucluelet	19-Dec-2022	0	1	No – expansion of existing site
Valemount	21-Nov-2022	0	1	No – expansion of existing site
West Vancouver	31-Mar-2023	0	1	Yes – expansion of existing site
Whistler	19-Jul-2022	0	1	Yes – expansion of existing site
<b>Total</b>		<b>7</b>	<b>32</b>	

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During the Reporting Period, BC Hydro decommissioned one EV charging site in Duncan after opening a larger charging site nearby. BC Hydro also did site swaps with FortisBC Inc. to align public EV charging services to be provided in the respective service territories. More specifically, BC Hydro signed over two sites to FortisBC (Princeton and Keremeos) and FortisBC signed over two sites to BC Hydro (Nakusp and New Denver).

## 6.2 Compliance Verification

The following is an account of the processes for each requirement described in section [6.1](#) above:

- **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 decide 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

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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.
- **Open Charge Point Protocol** – BC Hydro has confirmation in writing from its EV network platform vendor,<sup>17</sup> AddEnergie, that as January 2022, all of its networked public DC charging stations in operation are configured to support the Open Charge Point Protocol (OCPP 1.6J).

### 6.3 Summary of Results

Appendix 1 to Attachment 2 identifies each of BC Hydro's 141 eligible charging stations at 83 eligible charging sites as of March 31, 2023. All sites are in the Economic Development Region<sup>18</sup> and all fields have been merged into one table with each station itemized for multi-station sites. Cumulative stations and ports for April 1, 2020 to March 31, 2023 have been provided as a snapshot in time as of March 31, 2023.

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 141 charging stations is equipped with two connectors - a CHAdeMO connector and a SAE CCS connector.

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<sup>17</sup> The EV Network Platform is the software that communicates between the charging stations, the main system databases and the end-user for activation, customer experience and billing. OCPP would be the communication protocol between the charging station hardware and the main database.

<sup>18</sup> Including Cariboo Region, Kootenay Region, Mainland/Southwest, North Coast, Nechako, Northeast, Thompson-Okanagan, Vancouver Island-Coast.

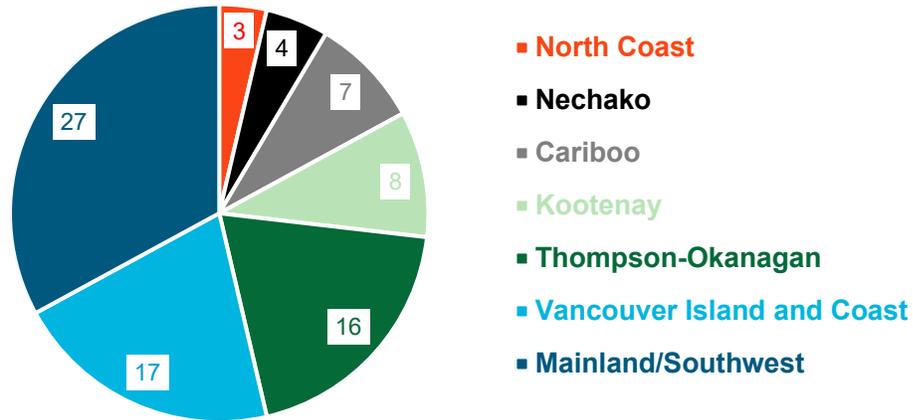
In fiscal 2024, BC Hydro will be changing its reporting to be based on “port” rather than charging station, because BC Hydro has charging stations on order that it plans to install in fiscal 2024 that have more than one port and thus can charge multiple vehicles simultaneously. BC Hydro would like to work with the Government of B.C. to change the reporting format for fiscal 2024 to accommodate multi-port charging stations and larger hub sites.

The number of charging sessions as well as kWh dispensed (measured by metering currently not yet approved by Measurement Canada) during fiscal 2023 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 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, 2022 for sites built in fiscal 2023 or prior and is based on a review of information in Plugshare.com.

The distribution of fast charging sites by Economic Development Region is provided in [Figure 1](#) below.

Figure 1 Distribution of Eligible Charging Sites by Economic Development Region



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

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**Attachment 2  
Fiscal 2023 Annual Report No. 6  
April 2022 to March 2023**

**Appendix 1  
Electric Vehicle Fast Charging Station Program  
Information as of March 31, 2023**

**PUBLIC**

## **REFER TO LIVE SPREADSHEET MODEL**

**Provided in electronic format only**

**(Accessible by opening the Attachments Tab in Adobe)**

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

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**Attachment 3**

**Final Report  
Peace Region Electricity Supply  
June 2023**

**PUBLIC**

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## **1 Executive Summary**

This is BC Hydro's Final Report for the Peace Region Electricity Supply (**PRES**) Project, which is a "prescribed undertaking" as defined in the Greenhouse Gas Reduction (Clean Energy) Regulation (**GRR**) for the purposes of section 18 of the *Clean Energy Act* (**CEA**) and a Low Carbon Electrification (**LCE**) Infrastructure Project undertaking under section 4(2) of the GRR. This report is provided in accordance with the April 2022 "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 (**the Ministry**).

The PRES Project was placed in-service in fiscal 2022 (May 2021) and the majority of the reclamation and remediation work was completed in fiscal 2023. The actual expenditure on the PRES Project was \$221.0 million as of the end of fiscal 2023. All activities for the PRES Project are expected to be completed in fiscal 2024 with a total project expenditure of \$223.1 million. An estimated 159,208 tonnes of GHG emissions were avoided since the PRES Project was placed in-service. The [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] [REDACTED] expired on August 31, 2021. No expenditures were incurred in fiscal 2023. This is also an LCE Infrastructure Project undertaking under section 4(2) of the GRR.

## **2 The GRR**

Section 18(1) of the CEA empowers the Lieutenant Governor in Council to prescribe, by regulation, classes of undertakings for the purpose of reducing 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 undertakings.

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.<sup>1</sup> Together, CEA section 18 and the GRR provide one of the statutory pillars of the Government of B.C.'s GHG emission reduction policy.

### **3 State of the Market and Program Planning**

#### **3.1 Background**

In December 2018, the Government of B.C. launched the CleanBC Plan, which set out a pathway to enable the Government of B.C. 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.

In the June 2021 Minister's Mandate Letter to BC Hydro, the Ministry set out expectations for BC Hydro to make substantive progress on certain priorities, including "provid[ing] leadership in advancing CleanBC's climate and economic development objectives, including electrification, fuel switching, and energy efficiency initiatives in the built environment, transportation, oil and gas, and other sectors." The Ministry also expected BC Hydro to "develop a short-term electrification plan that builds on the key results of the Comprehensive Review of BC Hydro and supports CleanBC".

In fiscal 2022, BC Hydro completed the development of the Electrification Plan and began to advance some of the actions included therein. The Electrification Plan

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<sup>1</sup> The GRR was further amended, and these amendments are not particularly relevant to this report.

describes BC Hydro's actions (as well some of the government programs) that include supporting customer fuel switching over a five-year period starting in fiscal 2022.

In December 2022, the Premier of British Columbia issued a Mandate Letter to the Minister of Energy, Mines and Low Carbon Innovation outlining the importance of continuing to deliver on the CleanBC Roadmap to 2030 policies and programs and continuing to work with BC Hydro to implement the Electrification Plan.

### **3.2 State of the Market Discussion**

The GRR Reporting Requirements ask for a "state of the market" discussion that includes consideration of program data, performance metrics, underlying assumptions regarding the metrics, ratepayer impacts and environmental benefits. BC Hydro's latest load forecast for the Peace Region indicates that there is significant load growth in the south Peace Region in the next five years and the PRES Project is still required.

The GRR Reporting Requirements also requests a report by a Fairness Advisor on the competitiveness of any call process held during the project period. BC Hydro confirms that it did not hold any call processes in regard to the PRES Project.

## **4 LCE Infrastructure Projects**

### **4.1 Overview**

In this section, the LCE Infrastructure Projects (i.e., being projects within the classes of undertaking under subsections 4(2) or 4(3)(e) of the GRR) and available evaluation results are discussed. The LCE Infrastructure Projects includes the PRES Project and the [REDACTED] Generation Agreement with Company X.

Northeast B.C. 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 constructed the PRES Project to address the constraints in the transmission system and provided [REDACTED] generation until the PRES Project was 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.

#### **4.2 Peace Region Electricity Supply (PRES) Project**

The PRES Project is in the South Peace region of B.C. The PRES Project consists of two parallel 230 kV transmission lines that connect the future Site C South Bank substation to the existing Shell Groundbirch substation using mainly wood pole construction and upgrades at each station. The transmission lines are 58 km long.

The PRES Project enables 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 GRR sections 4(2)(a)(i) and (ii). The PRES Project will reduce GHG emissions in B.C. from existing natural gas plants or from any prospective new natural gas plants 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 was placed in-service in fiscal 2022 (May 2021).

During fiscal 2023, BC Hydro addressed construction deficiencies and continued reclamation, remediation and slope stabilization work at locations along the transmission corridor. As of the end of fiscal 2023, BC Hydro has incurred \$221.0 million in total expenditures on developing the PRES Project. All activities for the PRES Project are expected to be completed in fiscal 2024 with a total project expenditure of \$223.1 million.

The PRES Project has avoided an estimated 159,208 tonnes of GHG emissions since the project went into service.

### **4.3 [REDACTED] Generation Agreement**

As reported in the fiscal 2018 GGRR Annual Report, BC Hydro entered into a Generation Agreement with Company X. The purpose of the Generation Agreement with Company X was 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 treated Company X's generation as a firm dispatchable system resource, such that any self-generated electricity temporarily replaced electricity that would otherwise be provided from the BC Hydro transmission system. BC Hydro had 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 had 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 [REDACTED] Project 4 facility effective December 31, 2020 but maintained the right to

direct Company X to temporarily island its [REDACTED] Project 3 facility until August 31, 2021 at which point the Generation Agreement automatically expired.

The actual total cost of the Generation Agreement was \$5.5 million.

#### **4.4 Quantitative Data – Methodology and Assumptions**

BC Hydro 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.

## 4.5 Performance Metrics

The GRR performance metrics for the PRES Project are listed in [Table 1](#) below.

**Table 1 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 GHG are emitted when fossil fuels are burned to create power, the PRES Project will reduce GHG emissions in B.C for any existing plant that elects to take grid service rather than self-supply using natural gas.

### 4.5.1 GHG Emission Reduction Methodology

BC Hydro estimated the impact the PRES Project had on GHG emission reductions in B.C. based on the methodology set out in section [4.5.1.1](#) below. BC Hydro applied these same assumptions and methodology to estimate the impact that generation had on GHG emission reductions in B.C. for the period of fiscal 2022 that the PRES project was not 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: ;<sup>2</sup>

<sup>2</sup> The efficiency assumption of 29.5% for gas turbines was developed by calculating the weighted average efficiency from metered data of two customer operated gas turbine electrical generation units.

- Less emissions intensity factor for BC Hydro grid electricity: [REDACTED];<sup>3</sup>  
and
- Net emissions intensity factor for electrified loads: [REDACTED].

#### 4.5.1.1 Methodology and Verification Methods

Depending on individual projects, 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 GHG emission reductions.

The GHG emission reduction estimates are developed as part of the technical review for each project 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

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<sup>3</sup> Source: British Columbia Government: 2017 B.C. Best Practices Methodology for Quantifying Greenhouse Gas Emissions, page 17.

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 include the customer reported value in Column H of [Table 3](#). BC Hydro may also conduct a technical review of baselines, calculations, and assumptions used to determine the GHG reductions in the Industrial Emissions Report. 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.

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

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 a gas processing plant which is being developed in three phases 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 or fiscal 2022. Further phases of the field/gathering system are expected to join the system in future fiscal years.

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.

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 [4.5.1.1](#) above. These values have been incorporated into the Summary of Results.

### 4.5.3 Explanation of Terms

[Table 2](#) below includes a description of the information provided in the results table for LCE Infrastructure Projects.

**Table 2 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)	Cumulative Costs (\$ million)	Cumulative actual costs in millions incurred from first year of expenditure to the end of the current reporting fiscal.
C (ii)	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	Cumulative: GHG Emissions Reduction Estimates (tonnes CO <sub>2</sub> e/year)	Cumulative GHG Emissions Reduction as at the end of the current fiscal period in tonnes of carbon dioxide equivalent per year.

### 4.5.4 Results Table

[Table 3](#) below provides the results for LCE Infrastructure Projects.

**Table 3 LCE Infrastructure Projects Final Results**

	A Prescribed Undertaking	B Name	C Cost		D Capacity of Facility (MW)	E Total Capacity Committed/ Secured (MW)	F Total Transmission Customer Load(s) Served (MW)	G Total Energy Provided to Customers (MWh)	H Cumulative GHG Emissions Reduction Estimates (tonnes CO <sub>2</sub> e/ year)
			Cumulative (\$ million) (i) <sup>2</sup>	Forecast Total (\$ million) (ii)					
1	T&D	PRES Project	221.0	223.1	800 - 950	49.5	39.6	200,537	159,208
2	Generation	██████████ (Company X)	5.5	5.5	67.6	67.6	48.2	383,307	840,742 <sup>1</sup>

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

2 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