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June 29, 2022

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

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 2022 Annual Report**

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BC Hydro writes to submit the Business Information and Declaration (Attachment 1), the Fiscal 2022 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, 2021 to March 31, 2022 (**Fiscal 2022**) 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 1, 2022, BC Hydro received from the MEMLCI an updated reporting template for the period from April 1, 2021 to March 31, 2022 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 29, 2022  
GHG Reduction (Clean Energy) Regulation Reporting  
Director, Clean Transportation Branch  
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

Page 2 of 2

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For further information, please contact the undersigned.

Yours sincerely,



Chris Sandve  
Chief Regulatory Officer

st/ma

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,<br>Vancouver BC V6B 5R3<br>Email: <a href="mailto:bchydroregulatorygroup@bchydro.com">bchydroregulatorygroup@bchydro.com</a> | 604-623-3726           |
| <b>Reporting Period:</b>  | April 1, 2021 to March 31, 2022 (Fiscal 2022)   |                        |
| <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<br>Chief Regulatory Officer  | June 29, 2022          |

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

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**Attachment 2**

**Fiscal 2022 Annual Report No. 5  
April 2021 to March 2022**

**PUBLIC**

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## 1 Executive Summary

This is BC Hydro's fifth 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 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**).

This report covers the annual period from April 1, 2021 to March 31, 2022 (**Fiscal 2022 or Reporting Period**) and BC Hydro's prescribed undertakings 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.

The expenditure for the LCE Programs in fiscal 2022 is approximately \$8.4 million, which covers the following undertakings:

- Providing supporting resources<sup>1</sup> for several new LCE studies and incentives to a new industrial project and launching the BC Hydro Residential Retrofit Heat Pump Incentive Program. All of these efforts are prescribed undertakings under section 4(3)(a) of the GGRR, further described in section [4.2](#) below;

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<sup>1</sup> Supporting resources can include funding provided by BC Hydro to enable studies, research, pilots and projects; and funding for public awareness campaigns and for the development of standards.

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- Providing supporting resources for one new research and pilot program. This is a prescribed undertaking under section 4(3)(c) of the GRR, and is further described in section [4.2](#) below;
  - Carrying out public awareness campaign activities related to the launch of BC Hydro's Residential Retrofit Heat Pump Incentive Program for residential heat pumps and educating customers on EV's and EV charging. These are prescribed undertakings under section 4(3)(a) of the GRR and further described in section [4.2](#) below; and
  - Providing supporting resources to enable the development of standards respecting technologies that use electricity instead of other sources of energy that produce more Greenhouse Gas (**GHG**) emissions. These projects are prescribed undertakings under section 4(3)(d) of the GRR and are further described in section [4.2](#) below.

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. The PRES Project was placed in-service in fiscal 2022 (May 2021). In fiscal 2022, actual expenditure on the PRES Project was \$12.5 million, with a cumulative cost of \$218.7 million as at the end of fiscal 2022. An estimated 39,110 tonnes of GHG emissions were avoided since the PRES Project was placed in-service. Total expenditures of \$0.3 million were incurred in fiscal 2022 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 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, one existing eligible charging site in Vernon with a single fast charging station was expanded with an additional fast charging station. At the end of the Reporting Period, there were 112 eligible charging stations at 78 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 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 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

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

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 2022 GRR Annual Report are those programs and projects with recorded costs in fiscal 2022.<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 its Fiscal 2023 to Fiscal 2025 Revenue Requirements Application, BC Hydro has sought approval 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.

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.

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 completed the development of 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.

In October 2021, the Province issued the CleanBC Roadmap to 2030, which states that “BC Hydro will advance its Electrification Plan by offering customers incentives, tools and business-to-business support to help them run their homes and businesses with clean electricity – and to reduce the time it takes to connect to the grid.”

### **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 2022. 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

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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>.

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 GRR 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 5](#) 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 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](#) below.

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 2022, BC Hydro did not hold any call processes in regard to its LCE Programs or its LCE Infrastructure Projects.<sup>5</sup> Therefore, no Fairness Advisor report is required.<sup>6</sup>

BC Hydro issued tenders including a Request for Proposal for higher power (100kW+) fast charging stations, a Request for Information regarding EV network software platforms and a Request for Information for grid-constrained/off-grid charging solutions in fiscal 2022. The tenders followed standard procurement processes at BC Hydro, using bidding platforms such as BC Bid.

### **3.3 Provincial Programs**

In fiscal 2019, BC Hydro became responsible for delivering offers within the CleanBC Better Buildings program on behalf of the Province. 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 Province that helps customers switch from fossil fuels to clean electricity.

In fiscal 2020, BC Hydro became responsible for delivering the Province'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

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<sup>5</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>6</sup> BC Hydro issued a direct award for the PRES Project for deficiency works as per the BC Hydro procurement methods.

supports multi-unit residential buildings and workplaces seeking solutions for their EV charging needs. The governmental program influences what programs BC Hydro funds as it seeks to align with and complement the programs and projects funded by the Province. BC Hydro's programs that complement the provincial 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 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.

The Province did not launch any additional programs to be administered by BC Hydro in fiscal 2022.

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

At the beginning of fiscal 2022, BC Hydro had 97 fast charging stations in operation at 71 sites across the province. At the end of fiscal 2022, BC Hydro had 112 eligible fast charging stations in operation at 78 sites. During fiscal 2022, BC Hydro continued to build out its EV fast charging network, by deploying 15 EV eligible fast charging stations. Fourteen of these fast charging stations were at seven new sites,

and one new fast charging station was added to an existing site that had a single EV fast charging station.

In January 2022, BC Hydro released “BC Hydro’s electric vehicle infrastructure Five-Year Plan – 2025”.<sup>7</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 will target province-wide coverage by 2024.

All of BC Hydro’s EV fast charging stations are in compliance with requirements of section 5 of the GGRR, as further discussed in section [6](#) below.

## **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;<sup>8</sup> and (ii) those that are infrastructure based.<sup>9</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

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<sup>7</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>.

<sup>8</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>9</sup> Being the classes of undertaking prescribed by subsections 4(2) and 4(3)(e) of the GGRR.

Requirements, and "Transmission, Distribution and Generation" referred to in subsection 6.9 of the GGRR Reporting Requirements, respectively.

In fiscal 2022, BC Hydro spent approximately \$8.4 million on its LCE Programs, including expenditures for the Initial LCE Projects and the BC Hydro LCE Program. The expenditures supported a new industrial project, several new studies, customer rebates directed towards the cost of purchasing a new heat pump, one research pilot and public awareness campaign activities, all prescribed undertakings under section 4(3)(a), 4(3)(b) and 4(3)(c) of the GGRR. BC Hydro also incurred expenditures to enable the development of standards under section 4(3)(d) of the GGRR. These LCE undertakings are discussed in section [4.2](#).

In fiscal 2022, BC Hydro made new funding commitments on customer projects for approximately \$2.8 million, but there are no expenditures for the projects associated with those commitments in the financial reporting for fiscal 2022. As noted in previous Annual Reports, funding commitments that did not result in expenditures in fiscal 2022 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 and CleanBC Better Homes programs on behalf of the Province. In fiscal 2019, to complement the Province'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 GHG emissions reduction programs funded by the Province or the federal government,<sup>10</sup> focusing on opportunities in industrial process, transportation, and new construction.

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<sup>10</sup> This multi-year program is also referred to as the "BC Hydro LCE Program" to distinguish it from the programs funded by the Province.

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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 under section 4(3)(a), section 4(3)(b), and section 4(3)(d) of the GGRR.

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## 4.2 Fiscal 2022 LCE Programs

In fiscal 2022, BC Hydro completed the development of the Electrification Plan which describes BC Hydro's actions, including support for fuel-switching activities and plan for electric vehicle charging stations.

In fiscal 2022, BC Hydro began to advance some of the actions in the Electrification Plan, while continuing with some of the existing LCE Programs. New actions in fiscal 2022 from the Electrification Plan included industrial energy manager coaching activities and the launch of BC Hydro's Residential Retrofit Heat Pump Incentive Program.

BC Hydro's undertakings within the LCE Programs (both continuing and new actions in fiscal 2022) fall within one or more classes of prescribed undertakings under 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. The expenditures in fiscal 2022 are listed below. [Table 5](#) includes the LCE Programs results for fiscal 2022, 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 2022 activities have been aggregated and summarized at the program level. An LCE program undertaken by BC Hydro may have multiple components, and each component meets one or more class of undertakings requirement as defined in sections 4(3)(a), 4(3)(b), 4(3)(c), or 4(3)(d) of the GGRR.

██ (Project 3 in [Table 5](#)): 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>11</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 expected completion date for the phase has shifted to fiscal 2023. Further project phases are expected to achieve Facility COD in subsequent fiscal years.

██ (Project 4 in [Table 5](#)): 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 accordance with the LCE Incentive Agreement. A third phase achieved Facility COD in fiscal 2022.

The BC Hydro LCE Program: [Table 1](#) below 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)          |

<sup>11</sup> Under the Incentive Agreement, Facility COD is required before an incentive fund payment can be made to the customer.

| Components           | GGRR Subsection |
|----------------------|-----------------|
| Standards Enabler    | 4(3)(d)         |
| Education & Training | 4(3)(b)         |

An overview of activities in fiscal 2022 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 GHG 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 GHG emissions. [Table 3](#) below provides descriptions of the incentive projects that were funded. In fiscal 2022, 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 | Six studies for the built environment sector were completed in fiscal 2022.<br>Two of the studies examined low carbon electrification options for a district energy system at post-secondary institutions in the Lower Mainland and on Vancouver Island.<br>Two of the other studies examined low carbon electrification options for a district | Lower Mainland, Vancouver Island/ Sunshine Coast | 6                 | 4(3)(a)          |

| Sector             | Description  | Location  | Studies Completed | GRR Sub-section |
|--------------------|--|---|-------------------|-----------------|
|                    | <p>energy system within municipalities in the Lower Mainland.</p> <p>The final two studies examined various fuel switching retrofit scenarios for HVAC and Domestic Hot Water across multiple buildings in the Lower Mainland.</p>   |   |                   |                 |
| Industrial Process | <p>Six studies for the industrial process sector were completed in fiscal 2022.</p> <p>A study was completed at a mining operation in the Northern Interior, which investigated a low carbon electrification option in place of mobile diesel equipment.</p> <p>Another site in the Lower Mainland investigated the use of electricity in place of fossil fuels to enhance an existing system and increase the heating capacity of the facility using heat pump technology.</p> <p>A study in the Northern Interior investigated opportunities to reduce natural gas consumption using low carbon electrification options to dry hog fuel.</p> <p>A study was completed at a mining operation in the Northern Interior which investigated the use of electricity in place of diesel-powered tunneling equipment.</p> <p>A study was completed at a Northern Interior mill to investigate low carbon electrification heating options in place of existing natural gas run building equipment.</p> <p>Another study was completed at a mill on Vancouver Island to investigate low carbon electrification options to run a hog dryer in place of existing equipment that runs using natural gas.</p> | Southern Interior, Northern Interior, Vancouver Island / Sunshine Coast, Lower Mainland | 6                 | 4(3)(a)         |
| Transportation     | <p>One study was completed in the transportation sector in fiscal 2022.</p> <p>The study examined the feasibility of acquiring new electric marine vessels and the associated charging requirements.</p>   | Lower Mainland, Vancouver Island / Sunshine Coast                                       | 1                 | 4(3)(a)         |

**Table 3      Incentive Projects**

| Sector             | Description  | Location          | Incentive Projects Completed | GRR Sub-section |
|--------------------|--|-------------------|------------------------------|-----------------|
| Built Environment  | BC Hydro launched the Residential Retrofit Heat Pump Incentive Program for residential heat pumps, which could be combined with other existing government funded incentives, to help customers with the costs of retrofitting their fossil fueled home heating system to one powered by clean energy. The program saw participation across all four regions in the province. | All Regions       | 686                          | 4(3)(a)         |
| Industrial Process | One incentive project in the Industrial Process sector completed in fiscal 2022.<br>A mine installed a trolley that provides hybrid haul trucks with electric power as they climb a long ramp out of the pit.  | Southern Interior | 1                            | 4(3)(a)         |

**Research and Pilot Programs:** BC Hydro works with customers and provides funding toward the research and development of technology, or pilot projects respecting technology, that may enable the customers to use electricity instead of other sources of energy that produce more GHG emissions. The research and pilot programs are undertakings within the class of prescribed undertakings set out in section 4(3)(c) of the GRR. In fiscal 2022, a pilot project, which investigated the performance of a small fleet of electric trucks and their charging dynamics over a six-month time period, was completed. The learnings and the data gathered from the pilot will be used to assess other electrification opportunities for long-haul trucks, including their charging loads and infrastructure needs. The fiscal 2022 expenditures for the research and pilot program activities are included in the BC Hydro LCE Program (row 11 in [Table 5](#)).

**Public Awareness Campaign:** This includes public awareness activities carried out by BC Hydro to educate customers on opportunities to switch to electricity from alternative fuel-sources to reduce GHG emissions. In fiscal 2022, BC Hydro focused on two mass market campaigns that ran in the fall and spring to promote switching

to an all-electric heat pump for home heating and cooling. Ongoing customer education on EV's and EV chargers also continued through fiscal 2022. The public awareness campaigns related to heat pumps and EV's and EV chargers are undertakings within the class of prescribed undertakings set out in section 4(3)(a) of the GGRR. The fiscal 2022 expenditures for the public awareness campaigns 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 GHG 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 GHG emissions. BC Hydro's activities in this regard target the transportation and building sectors.

BC Hydro undertook work with regard to the transportation sector including the following:

- BC Hydro continued its support of a local government led EV Peer Network. The network provides a channel for staff from BC local governments, the provincial government, BC Hydro and FortisBC to collaborate and share best practices, activities, challenges and advice around EV policies and programs related to increasing adoption of electrification technologies.
- BC Hydro supported the planning and implementation of electric mobility strategies and projects for electrification technologies on Vancouver Island and in Northern BC to define innovative pilot projects that communities could undertake as part of a shared vision.

- 
- BC Hydro supported the development of shareable guidance documents and resources related to increasing adoption of electrification technologies (such as strata materials that local governments can use to communicate the benefits as well as the process for undertaking 100% EV Ready Retrofits).

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

- BC Hydro began development of a partnership program for local governments that will reduce barriers to electrification technologies, such as heat pump installations on private property (e.g., creating consistent bylaws and aligning training with local governments and industry around installation best practices).
- BC Hydro supported partnerships with industry and governments to amplify peer learning to advance standards for technologies that use electricity instead of other sources of energy that produce more GHG emissions and reduce roadblocks so that the industry at large can achieve high performance and low-carbon buildings cost-effectively in pursuit of existing and anticipated building energy and carbon performance requirements.
- BC Hydro supported local government initiatives towards building industry capacity and training opportunities related to electrification technologies and high-performance buildings.

Standards Enabler undertaking expenditures fall under section 4(3)(d) of the GGRR. In fiscal 2022, 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 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 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.

The industrial LCE incentive project described in [Table 3](#) has gone through a technical review and has a site-specific measurement and verification plan for the estimated additional electricity consumption and average demand. measurement and verification plans are included as part of the funding agreement between BC Hydro and the funding recipient. The methodology used for this project generally follows “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'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.

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 different levels of government in the advancement of standards, policies, bylaws, and community plans for the electrification technologies 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.

## 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 5](#) 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 \$226 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 GHG emissions. |

| <b>Column</b> | <b>Heading</b>  | <b>Descriptions</b>  |
|---------------|---|--|
| 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 <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(ii)         | 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 5](#) 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. 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 undertakings under 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, 2022**

|    | A<br>GGRR  | B<br>Project / Program / Contract / Expenditure | Municipality / Location      | Start Date <sup>6</sup> | C<br>Expenditure <sup>2</sup> (\$ million) |                       | D<br>Cost Effectiveness (F2018\$ million) |                                | E<br>Additional Energy Consumption <sup>3</sup> (MWh/year) |                        | F<br>Additional Demand (MW) |                        | G<br>Estimated GHG Emission Reductions (tonnes CO <sub>2</sub> e/year) |                        |
|----|------------|---|------------------------------|-------------------------|--|-----------------------|---|--------------------------------|--|------------------------|-----------------------------|------------------------|--|------------------------|
|    |            |   |                              |                         | Actual F2022 (i)                           | Cuml. F2018-F2022(ii) | NPV to 2030 (Fiscal 2031)                 | GGRR NPV to 2030 (Fiscal 2031) | Actual F2022 (i)   | Cuml. F2018-F2022 (ii) | Actual F2022 (i)            | Cuml. F2018-F2022 (ii) | Actual F2022 (i)   | Cuml. F2018-F2022 (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>4</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>5</sup>             | [REDACTED]                   | Fiscal 2018             | -0.99                                      | 6.94                  | 64.3                                      | 64.3                           | 0  | 130,305                | 0.0                         | 17.5                   | 0  | 77,911                 |
| 6  | 4(3)(a)    | [REDACTED] (Project 4)                          | [REDACTED]                   | Fiscal 2018             | 1.15                                       | 12.40                 | 45.9                                      | 110.2                          | 22,338   | 208,488                | 3.0                         | 28.0                   | 13,356   | 124,658                |
| 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                            | Province-wide                | Fiscal 2019             | 7.16                                       | 13.49                 | 115.5                                     | 226.0                          | 14,599   | 19,308                 | 10.5                        | 11.2                   | 7,260  | 10,890                 |
| 11 | 4(3)(c)    | BC Hydro LCE Program                            | Province-wide                | Fiscal 2019             | 0.15                                       | 0.59                  | 0.0                                       | 226.0                          | 0  | 0                      | 0.0                         | 0.0                    | 0  | 0                      |
| 12 | 4(3)(d)    | BC Hydro LCE Program                            | Province-wide                | Fiscal 2019             | 0.97                                       | 2.41                  | 0.0                                       | 226.0                          | 0  | 0                      | 0.0                         | 0.0                    | 0  | 0                      |
|    |            | <b>Total</b>                                    |                              |                         | <b>8.44</b>                                | <b>36.81</b>          | <b>226.0</b>                              | <b>226.0</b>                   | <b>36,937</b>  | <b>360,484</b>         | <b>13.5</b>                 | <b>58.1</b>            | <b>20,616</b>  | <b>213,902</b>         |

<sup>1</sup> 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.

<sup>2</sup> 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.

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

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

<sup>5</sup> Fiscal 2022 expenditures for Project 3 represent a payment to BC Hydro for offsets sold in Fiscal 2021.

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

#### **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.

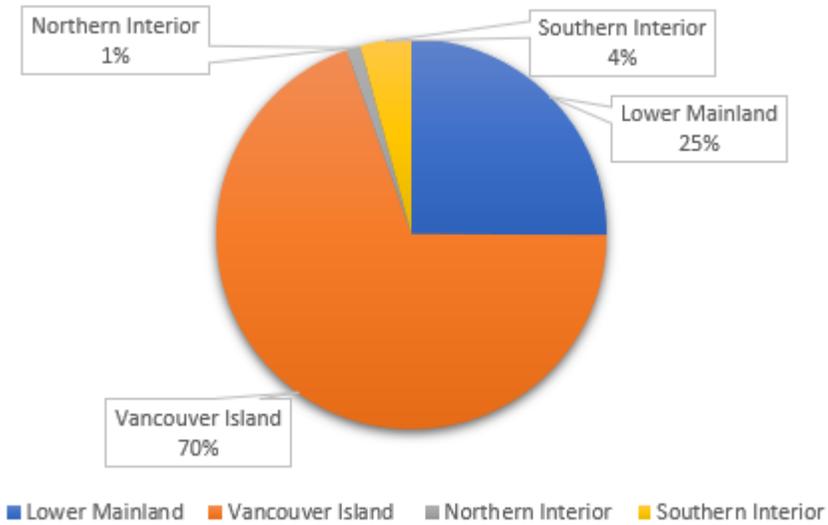
For the purpose of showing LCE Program activities distributed by region and by sector we have used the term ‘Project’ to represent individual studies, research or pilot activities, or implementation projects where customers have acquired and installed equipment that uses electricity instead of other 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 as such would not be meaningful in a graphical depiction.

[Figure 1](#) below highlights that the highest number of projects are on Vancouver Island, while [Figure 2](#) below highlights that the majority of projects are in the industrial process sector.<sup>12</sup>

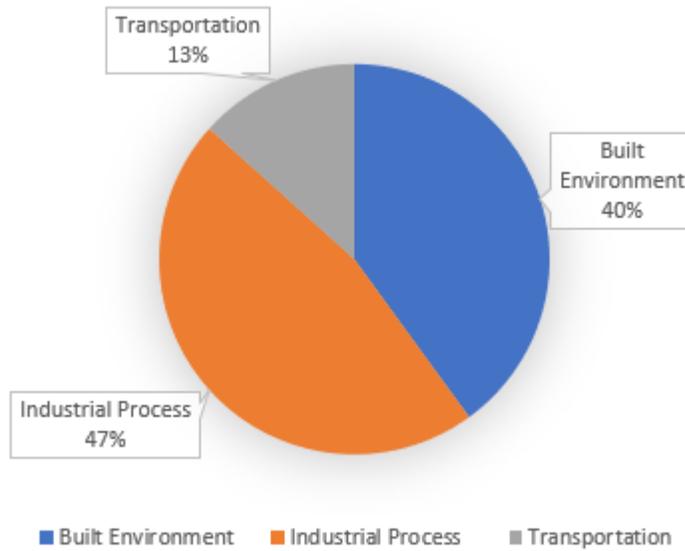
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<sup>12</sup> [Figure 2](#) does not include Residential Heat Pumps due to the large number of projects completed in fiscal 2022 (686). Including the projects renders the figure meaningless because it skews the Built Environment portion to 99% of total projects in fiscal 2022.

**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 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 2022 LCE Infrastructure Projects**

In fiscal 2022, 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 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).

During fiscal 2022, BC Hydro placed the PRES Project into service and began addressing construction deficiencies. BC Hydro also continued reclamation, remediation and slope stabilization work at locations along the transmission corridor. As of the end of fiscal 2022, BC Hydro has incurred \$218.7 million in total expenditures on developing the PRES Project, of which \$12.5 million was incurred in fiscal 2022.

The PRES Project has avoided an estimated 39,110 tonnes of GHG emissions between May 2021 when it was placed in-service and March 2022.

### **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 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 total expenditures incurred in fiscal 2022 with respect to this agreement are \$0.3 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<br>GHG emissions reduction                                     |
| Generation                  | Generation Agreement | New load served<br>Mitigation of system constraints<br>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.

### ***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].

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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.

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***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.

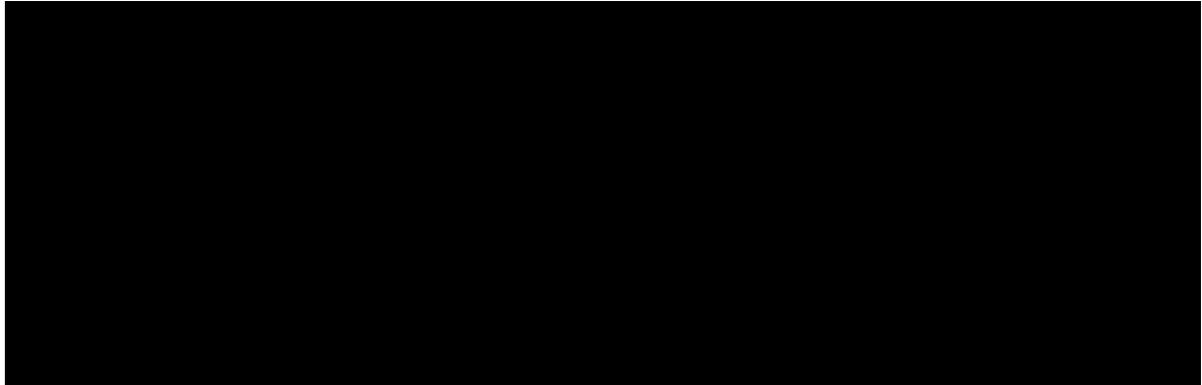
The Project 3 site was energized from the BC Hydro transmission system in fiscal 2019. This site comprises a gas processing plant which is being developed in three phases and one field/gathering system.

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.

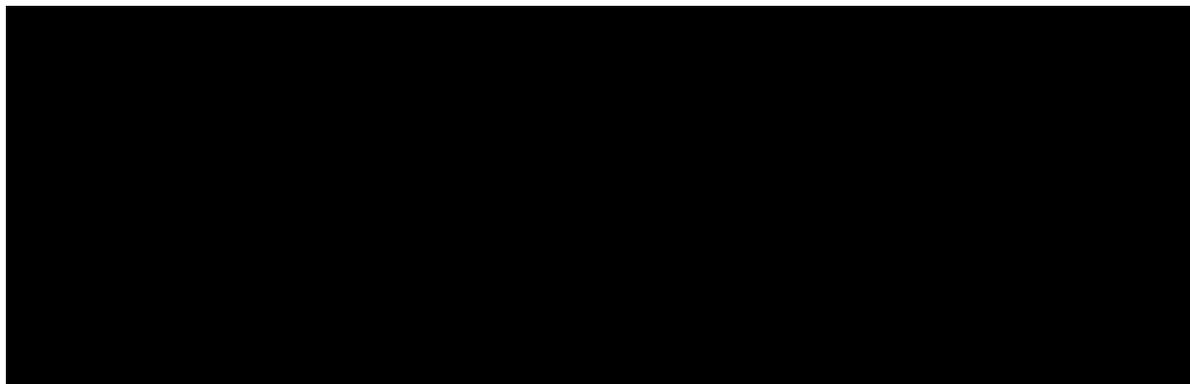
The load associated with the field/gathering system is being phased into the BC Hydro system. One phase of the field/gathering system load was introduced to the BC Hydro system in fiscal 2019. Another phase of the field/gathering system load was new to the BC Hydro system in fiscal 2020. There were no 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.

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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<sub>2</sub>e.



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<sub>2</sub>e.



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**

| <b>Column</b> | <b>Heading</b>                | <b>Descriptions</b>   |
|---------------|-------------------------------|---|
| 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.  |

| <b>Column</b> | <b>Heading</b>  | <b>Descriptions</b>  |
|---------------|---|--|
| 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 8](#) below provides the results for LCE Infrastructure Projects with expenditures in fiscal 2022.

**Table 8 LCE Infrastructure Projects Results for Year Ending March 31, 2022**

|   | A                           | B            | C    |                           |  | D  | E   | F  | G  | H                    |                      | I                         |     |
|---|-----------------------------|--------------|------|---------------------------|--|--|---|--|--|----------------------|----------------------|---------------------------|-----|
|   | A<br>Prescribed Undertaking | B<br>Name    | C    |                           |  | D<br>Total Transmission Customer Load(s) Served (MW) | E<br>Total Energy Provided to Customers (MWh) | F<br>GHG Emissions Reduction Estimates (tonnes CO <sub>2</sub> e/year) | G<br>Fossil Fuel(s) Avoided or Displaced | H                    |                      | I                         |     |
|   |                             |              | Cost | Capacity of Facility (MW) | Total Capacity Committed/ Secured (MW) |  |   |  | Prescribed Undertaking                   | Name                 | Cost                 | Capacity of Facility (MW) |     |
| 1 | T&D                         | PRES Project | 12.5 | 218.7                     | 285                                    | 800 - 950  | 24  | 17   | 65,305 <sup>1</sup>                      | 39,110               | 39,110               | n/a                       | n/a |
| 2 | Generation                  | (Company X)  | 0.3  | 5.5                       | 12                                     | 67.6   | 67.6  | 48.1   | 365,680                                  | 199,423 <sup>2</sup> | 611,186 <sup>2</sup> | n/a                       | n/a |

- Expected total new facility load served from the BC Hydro transmission system is 164,533 MWh of load from existing brownfield facilities that fuel-switched to grid power and 125,091 MWh of load from new greenfield facilities that electrified.
- 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. This number is an estimate for calendar year 2021, but it is expected to be close to the number for fiscal year 2022 which was unavailable at the time this report was prepared.
- 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<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, 2021 to March 31, 2022, 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, one additional EV fast charging station was added to an existing site. As of March 31, 2022, BC Hydro has 112 EV fast charging stations in operation at 78 sites across the province.

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.

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 9](#) below, for those charging stations newly in-service in fiscal 2022, 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.

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 9      Eligible Fast Charging Stations  
 Added - Fiscal 2022**

| Location/Site      | In-Service Date | Number of New EV Fast Charging Sites | Number of EV Fast Charging Stations | Limited Municipality?            |
|--------------------|-----------------|--------------------------------------|-------------------------------------|----------------------------------|
| Smithers           | 02-Dec-2021     | 1                                    | 2                                   | No                               |
| Fraser Lake        | 09-Feb-2022     | 1                                    | 2                                   | No                               |
| Lillooet           | 02-Mar-2022     | 1                                    | 2                                   | No                               |
| Houston            | 02-Mar-2022     | 1                                    | 2                                   | No                               |
| New Hazelton       | 09-Mar-2022     | 1                                    | 2                                   | No                               |
| Agassiz            | 11-Mar-2022     | 1                                    | 2                                   | No                               |
| Gold River         | 31-Mar-2022     | 1                                    | 2                                   | No                               |
| Vernon (Expansion) | 21-Jan-2022     | 0                                    | 1                                   | Yes – expansion of existing site |
| <b>Total</b>       |                 | <b>7</b>                             | <b>15</b>                           |                                  |

During the Reporting Period, BC Hydro decommissioned none of its EV fast charging sites or stations.

## 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

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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.
- **Open Charge Point Protocol** – BC Hydro has confirmation in writing from its EV network platform vendor,<sup>16</sup> AddEnergie, that as January 2022, all of its

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<sup>16</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.

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 112 eligible charging stations at 78 eligible charging sites as of March 31, 2022. All sites are in the Economic Development Region<sup>17</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, 2022 have been provided as a snapshot in time as of March 31, 2022.

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

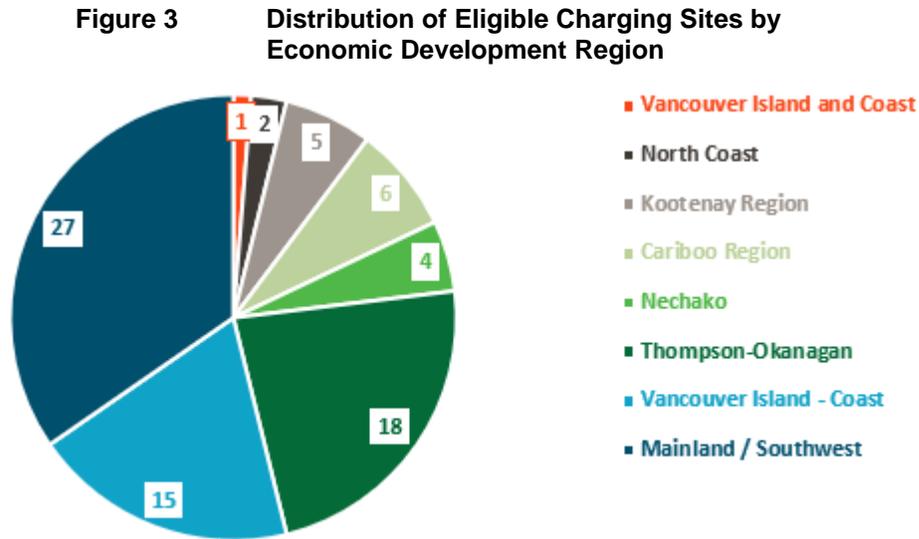
The number of charging sessions as well as kWh dispensed (measured by metering currently not yet approved by Measurement Canada) during fiscal 2022 for each eligible charging station is provided in Appendix 1 to Attachment 2.

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 is based on a review of information in Plugshare.com.

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<sup>17</sup> Including Cariboo Region, Kootenay Region, Mainland/Southwest, North Coast, Nechako, Northeast, Thompson-Okanagan, Vancouver Island-Coast.

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



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

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**Attachment 2  
Fiscal 2021 Annual Report No. 5  
April 2021 to March 2022**

**Appendix 1  
Electric Vehicle Fast Charging Station Program  
Information as of March 31, 2022**

**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**

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**Attachment 3**

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

**PUBLIC**

**REFER TO LIVE SPREADSHEET MODEL**

**Provided in electronic format only**

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