



BC Hydro 2019 Carbon Neutral Action Report

May 2020

 **BC Hydro**
Power smart

This Carbon Neutral Action Report contains mandatory information required to meet the revised Carbon Neutral Action reporting requirements for 2019 emissions. Details of BC Hydro's 2018 GHG emissions can be found online in the 2018 Carbon Neutral Action Report in our website at **bchydro.com**.

Overview

BC Hydro's vision is to be the most trusted, innovative utility company in North America in providing safe, reliable, affordable, clean electricity throughout British Columbia. BC Hydro consistently has some of the lowest greenhouse gas (GHG) emissions in the North American electricity industry contributing to less than 1% of GHG emissions in the province. We've developed a legacy of environmental stewardship by embedding environmental requirements and considerations into our decision-making and tracking our GHG emissions performance each year. BC Hydro's Environment Strategy provides direction on objectives that will ensure BC Hydro's actions contribute to a healthy environment for the long term. One of these objectives is to "support climate actions and targets" as set out by the Province.

In 2019, we set a path for GHG mitigation demonstrating our commitment to the goals of carbon neutral government and leadership in emission reductions supporting CleanBC. A comprehensive GHG Management plan that details all our sources of emissions, sets reduction targets and measures, and identifies accountabilities specific to each of the emission sources is in development for 2020. The elements of this plan are to be carried out over the subsequent 10 years and will align with the 2030 targets outlined in CleanBC. The plan will also adapt to any new regulations that come into force during this period as required.

This report focuses on BC Hydro's carbon neutral activities related to the operations of our buildings and fleet and our use of paper. It also identifies our efforts to reduce greenhouse gas emissions, our ongoing work to understand climate change and its effects on our business and the communities we serve, our support for energy conservation in the public sector, and our new and upgraded energy projects, which emphasize clean and renewable production.

Cover photograph—Revelstoke Dam

2019 greenhouse gas emissions

Due to the COVID-19 pandemic, B.C. Government had issued a Directive¹ on March 31, 2020 that states “all ministries and Public Sector Organizations covered by the Carbon Neutral Government requirement shall use their 2018 GHG emissions as a temporary estimate for their actual 2019 GHG emissions, for the purposes of the 2019 Carbon Neutral Action Reports and 2019 Carbon Neutral Government reporting required under the Climate Change Accountability Act”.

This Carbon Neutral Action Report contains mandatory information required to meet the revised Carbon Neutral Action reporting requirements for 2019 emissions. Details of BC Hydro’s 2018 GHG emissions can be found online in the 2018 Carbon Neutral Action Report in our website at **bchydro.com**. BC Hydro’s actual GHG emissions for 2019 will be reported to the Province in September 2020.

¹https://www2.gov.bc.ca/assets/gov/environment/climate-change/cng/guidance-documents/dir_of_clean_govt_notification_to_psos.pdf

Carbon neutral actions

Buildings

BC Hydro owns or leases approximately 250 buildings in more than 80 municipalities across British Columbia, covering more than 340,000 square metres of floor space. We incorporate energy savings opportunities and sustainable design aspects in our capital construction and renovation plans, and life-cycle costing in our project decision making. Our continued investment in new construction, renovations, and capital upgrades ensures lasting energy performance by incorporating energy efficiency measures.

BUILDING DEVELOPMENT (NEW BUILDINGS AND MAJOR RENOVATIONS)

The most significant Properties project completed in 2019 was a new field building in Pemberton. The new building is an improvement to the original and was designed to meet the latest Building Code's energy efficiency targets through the use of a high performing envelope, energy efficient HVAC systems, and an energy efficient lighting system. There is no natural gas service connection to the building. Building heating and cooling is provided primarily by Air Source Heat Pumps (ASHPs) and are backed up by electric reheat coils.

BUILDING IMPROVEMENTS (MINOR RENOVATIONS AND BUILDING SYSTEM UPGRADES)

We consider energy efficiency opportunities as part of the project scope for building improvements and upgrades. We have focussed our efforts on buildings with the greatest potential benefit. In 2019, some of the projects we delivered with energy efficiency benefits included:

- At the Prince George Nicholson building, we replaced Roof Top Units (RTUs) equipped with R-22 refrigerant with new RTUs that use a reversing heat pump system. The new, efficient units operate 100% under electrical power to -5°C and then switch over to gas heating. In addition programmable thermostats were installed allowing better control of building temperatures. A 30% reduction in natural gas consumption is anticipated compared to the pre-existing RTU units.
- At the Ingledow building, we installed a Direct Digital Control (DDC) system to optimize and control the existing Heating Ventilation and Air Conditioning (HVAC) system. The HVAC system was also rebalanced and recommissioned.
- At Williams Lake, we replaced the existing roof with a new roof, increasing insulation value of the roofing assembly.
- We completed an interior upgrade project at the Invermere District Office, including installation of energy efficient fixtures for lighting, plumbing fixtures, high wear and recyclable interior finishes and fixtures.
- We completed an interior upgrade project at the Hope District Office, including installation of energy efficient fixtures for lighting, plumbing fixtures, high wear and recyclable interior finishes and fixtures. In addition a DDC system was installed to better control existing HVAC equipment.
- We completed an interior upgrade project at our Quesnel District Office, including installation of a DDC system, replacement of the HVAC system, installation of energy efficient fixtures for lighting, plumbing fixtures, high wear and recyclable interior finishes and fixtures.



Pemberton Field Office



Prince George Nicholson Building roof top unit replacement

Vehicle fleet

Our vehicle fleet supports operations throughout the province and as of the end of 2019, included more than 2,800 vehicles. We are improving fleet fuel efficiency by regularly replacing end-of-life vehicles with newer, more efficient models and performing regular maintenance on all of our vehicles. During 2019, gasoline consumption from light duty vehicles and trucks decreased to 2,322,321 litres from 2,475,987 litres in 2018. This is a saving in light truck and vehicles gasoline fuel consumption of 153,666 litres, or 6.2%.

Hybrid and electric vehicles are incorporated into our vehicle fleet as part of the regular vehicle replacement process, where cost-effective and appropriate, based on the expected vehicle operating requirements and the available vehicle capabilities and capacities. In 2019, 100% of our light duty vehicles (cars) were green and consisted of 58% electric; 35% hybrid and 7% plug-in hybrid vehicles. In addition, light duty truck segment has 15% green vehicles (includes hybrid SUVs) and we are piloting heavy duty segment with hydraulic hybrid vehicles. In the equipment category, 18% of our forklifts are electric.

BC Hydro's subsidiary, Powertech, tests high pressure hydrogen components, designs and constructs fueling stations for hydrogen fuel cell vehicles, provides fueling protocols, and operates a fast fill hydrogen fueling station at their headquarters in Surrey.

In summary, BC Hydro has taken the following key measures to reduce emissions associated with our vehicle fleet:

1. Incorporating new and existing commercially available technologies such as hybrids, electric and extended-range electric vehicles on light duty trucks and SUVs as noted above.
2. Piloting green fleet products in all vehicle segments.
3. Developing a telematics program that will provide accurate operational data related to fuel use, vehicle use and driver behavior.
4. Promoting ride sharing.
5. Working with governments, business and stakeholders to expand Direct Current Fast Charger station infrastructure in B.C. for public use.
6. Developing Heavy/Medium duty vehicles segment list and matrix of hybrid / electric vehicle alternatives that are commercially available.
7. Developing preliminary budget assessments and risk matrix for heavy / medium duty vehicles.
8. Identifying heavy / medium duty service vehicles based on telematics data and risk matrix that would be most suitable for replacement with electric / hybrid vehicle alternatives.



BC Hydro plug-in hybrids

Paper

Since 2010, we have reduced our office paper use by 40%. BC Hydro continues to promote the use of 100% recycled paper for copying purposes. About 82.3% of paper used in 2019 is 100% recycled paper. To keep our paper use low, all network printers and photocopiers are set to double-sided printing by default.

BC Hydro continues to look for opportunities to mitigate GHG emissions from its operations. Our GHG emissions from paper consumption in 2019 is 135.3 tons which is 3.4% lower than 2018.

In fiscal year 2020, BC Hydro continued to promote paperless billing to our customers with a focus on consolidated customers. Consolidated customers are those companies or groups with multiple service points across the province. This capability was made possible as a result of an enterprise infrastructure billing project. Since the start of the project, we have been able to convert about 55,157 consolidated member accounts out of about 109,000. The F2O consolidated member account paperless target was an aggressive 60%, with the result coming in at a strong 51%. As a result, the percentage of total paperless billing customers rose to 57.8% at end of the fiscal year a 4% increase compared to last year.

We continue to have one of the highest rates of paperless billing among those utilities surveyed by the Canadian Electricity Association. This adoption rate is facilitated by our efforts to make it easier for customers to pay their bills via the option of detailed email bill notifications including the amount owing, due date and electricity usage.

Other GHG reduction initiatives

In 2019, BC Hydro continued participation in Compugen's Green4Good program that helps organizations to dispose of their end-of-first-life® (EOFL) IT assets in an environmentally responsible way. Typically 90% of the EOFL assets can be securely refurbished and resold, allowing Green4Good to pay the organization for their serviceable assets. By deferring the manufacture of new IT assets through reuse, a voluntary carbon offset is created that gets registered with the Canadian Standards Association GHG Reductions Registry. These carbon offsets have been verified by an external verifier.

In 2019, 94 tonnes of carbon offsets have been generated by Compugen in BC Hydro's name (through reuse of BC Hydro's end-of-life IT assets).

BC Hydro is working on mitigating sources of greenhouse gas in our operating system. Sulphur hexafluoride (SF₆) and carbon tetrafluoride (CF₄) are potent greenhouse gases used in electrical equipment worldwide which can leak to the atmosphere. BC Hydro is continuing to manage SF₆ and CF₄ releases by prioritizing repairs or replacement of leaking equipment identified in the annual release report. We have developed the SF₆ and CF₄ tracking application, which will help ensure accurate and timely accounting of gas releases. The app is anticipated to be rolled out to field crews in calendar 2020.



Adaptation to climate change

BC Hydro recognizes that climate change is creating an increase in weather related challenges for our system that could negatively impact our operating flexibility, reliability of service, and asset maintenance and recovery costs. Adaptation to address the impacts of a changing climate is essential for continuing to provide our customers with safe, reliable and affordable power. We also recognize there may be some longer term opportunities associated with the impact of climate change on river basin inflows and water temperatures, on seasonal and daily load patterns, and electricity trade patterns.

This is why BC Hydro has been actively engaged in understanding climate change risks and opportunities and the potential impacts on our system. We are working collaboratively across our company and with external partners to address these impacts and implement solutions. Our asset management and emergency management processes have continuously evolved to prepare for and effectively respond to increasingly severe weather-related events. We have robust business practices in place to ensure an adaptive and resilient system, and plans to identify and address outstanding gaps.

In terms of next steps, BC Hydro will continue to integrate current climate change science with coordinated and evidence-based assessments of our strengths and vulnerabilities in a changing climate. This will be achieved by using a balanced approach to managing climate and non-climate risks, and by integrating adaptation into our business practices.

BC Hydro has actions underway to evolve and refine our adaptation practices. Over the next months and years, we plan to continue to:

- enable a coordinated and cost-effective approach to understanding the impacts of climate change on our planning, design and operations
- use consistent, quantitative, evidence-based assessments to inform our decision-making related to climate change adaptation
- integrate current climate change science into our planning, design and operations
- ensure our adaptation and mitigation strategies are complimentary
- engage, consult and transparently communicate our efforts with key stakeholders, peers, First Nations communities, and our customers

Our goal is to ensure that BC Hydro has the adaptive capacity to continue to safely provide our customers with reliable, affordable, clean electricity.

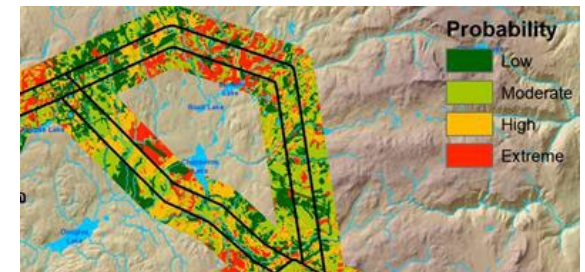
One area BC Hydro is focused on is managing our wildfire risk. Wildfires pose a significant risk to transmission and distribution lines, substations and generation facilities and to the safety of workers. BC Hydro's electrical system and field workers also pose risks of igniting wildfires through normal activities in high risk areas.

We are in the process of refreshing BC Hydro's wildfire risk models, which will now include transmission, distribution and generation assets. Several aspects of our existing risk model will be enhanced, including new forest cover data, new computing tools and techniques, and improved prediction modelling for wildfire rate of spread and intensity.

The risk model is not only used for wildfire response, but also in the design of new assets and maintenance of existing assets. When siting and routing options are being evaluated, the risk of wildfire is an input into our decision making process.



Pole damaged by wildfire



Wildfire risk modeling tool

Support to the CleanBC plan

Released in December 2018, CleanBC presents a pathway to a more prosperous, balanced and sustainable future. Over the next decade and beyond, the plan outlines an increased use of clean and renewable energy in transportation, buildings and industry. British Columbia has a large, hydroelectric system where nearly 98% of the electricity BC Hydro generates is clean. BC Hydro has a critical role to play in achieving the electrification goals in CleanBC.

Achieving British Columbia's legislated GHG emission targets will require a major shift from fossil fuels to clean electricity generated by BC Hydro and other low emission energy sources, such as hydrogen. The policies and strategies in the CleanBC plan are expected to require additional electricity over and above currently projected demand growth to electrify key segments of our economy.

For the 2019 CNAR, we are highlighting our progress in two CleanBC targeted areas—Transportation sector (EV charging infrastructure) and Industry (significant GHG reduction potential).

EV charging stations

As part of the efforts to actively remove barriers and support the wider adoption of electric vehicles (EVs), BC Hydro has focused on building out a network of public fast-charging stations and greatly improving driver experience. Currently we have 70 sites with 83 direct current fast chargers (DCFC) and we are planning to install another 35 chargers this fiscal year.

Working closely with EV drivers over a number of months our study revealed a few key areas where BC Hydro needed to improve.

“This station is always busy. You need to add more chargers.”

“I like when I can grab a coffee or run some errands while I charge.”

“I wouldn’t charge here at night. It’s poorly lit and pretty isolated.”

1. RELIABILITY

We received feedback from customers on the reliability of the stations. EV drivers expect chargers to be working when they arrive at a station to charge. To better meet this expectation, BC Hydro completely transformed its operating model in early 2019 to improve the way it handles charging station outages and repairs. This resulted in a significant drop in the average time it takes to resolve charging station issues: from 9.7 days in 2018 to just 1.6 days in 2019. BC Hydro also implemented a dedicated team of agents to handle customer support calls and has a maintenance and inspection team dispersed across the Province to provide a consistent experience in maintenance and service support.

2. DRIVER EXPERIENCE & SAFETY

An ideal charging station experience for EV drivers includes a few key design elements: proximity to amenities, safety by design, etiquette considerations and mobile support.

Proximity to amenities—For many drivers, “waiting time is wasted time” and they prefer to have something to do while they charge or wait for their turn to charge. The BC Hydro EV team has become more deliberate about selecting locations within walking distance to shopping, banking, washrooms and other amenities.

Safety by design—BC Hydro made a number of improvements to its station design to address driver safety. New charging stations include adequate lighting and are installed in high pedestrian and/or vehicular traffic areas with open lines of sight which help provide natural surveillance. BC Hydro has also included helpful safety information in its station signage.



EV chargers during day



EV chargers at night

Etiquette—A scan of PlugShare comments reveals driver frustrations over charging etiquette. To address these concerns, BC Hydro included etiquette reminders in station signage and on stickers placed directly on the chargers. Drivers are being asked to limit their charge time; stay close by in case they need to move their EV; use PlugShare to sign in/out and leave notes for drivers; and to keep stations tidy.

Mobile support—BC Hydro has developed an app to provide drivers a single, consistent interface across its charging network. The app allows users to search for stations, set up favourite stations, activate a charge, order RFID cards, add funds and in the future, be able to pay for a charge.

3. EXPANSION & DENSIFICATION

EV drivers not only want BC Hydro to install stations in a greater number of locations but also to install more than one station on a single site. In 2019, BC Hydro added and upgraded more than 20 stations. Adding extra stations along popular travel corridors is addressing the range anxiety drivers experience when they need to travel long distances. And since some sites are much busier than others, the additional charging stations reduced wait times for drivers.

For its efforts to improve the driver experience, BC Hydro's EV Team was recognized by E Source and received an award in "Innovation in Residential Customer Design" in October 2019.

In 2020, BC Hydro will continue to add and upgrade stations as well as make improvements to its charging station design to address accessibility concerns.

Fleet electrification rate

At the end of March 2020, the British Columbia Utilities Commission approved BC Hydro's application for a Fleet Electrification Rate. The rate is intended to support the electrification of fleets with two different rate structures: a Demand Transition Rate and an Overnight Rate. The demand transition rate is in effect starting in April 1, 2020 while the overnight rate is in effect starting April 1, 2021. The demand transition rate is designed to ease the impact demand charges have on fleet electrification, especially at early stages of adoption when load profiles are low. The overnight rate supports the impact of demand charges on fleet electrification when fleets require a long period of charging—for example, charging overnight.

Electric bus infrastructure

In Sept 2019, as part of the continued progress of the Pan-Canadian Electric Bus Demonstration and Integration Trial, TransLink and CUTRIC (Canadian Urban Transit Research and Innovation Consortium) announced the operation of the first of four battery electric buses and two high-powered, standardized overhead charging systems. As the utility provider, BC Hydro worked closely with TransLink on the implementation of the overhead charging systems. BC Hydro continues to support customers like TransLink with innovative pilot projects and the ability to implement rates to support the evolution of the electrification of transportation.



Overhead bus charger

Industry

In April, 2019 BC Hydro announced the approval of \$83.6 million of federal funding for the Peace Region Electricity Supply (PRES) project from the Investing in Canada Infrastructure Program (ICIP), and follow-through on the ongoing commitment of the governments of Canada and B.C. to work together to develop and invest in infrastructure that will avoid greenhouse gas emissions.

This aligns with the Pan Canadian Framework on Clean Growth and Climate Change which recognized the opportunity for collaboration between B.C. and Canada to bring clean grid electricity to natural gas operations in northeastern B.C. It also supports the CleanBC initiative of industrial electrification, specifically providing clean electricity to planned natural gas production in the Peace region.

The PRES project includes the construction of two new 230-kilovolt transmission lines between the Site C substation and the Groundbirch substation, expansion of the Groundbirch substation to accommodate the two new transmission lines and construction of a new 230-kilovolt switchyard at the Site C substation, at a total expected cost of \$289 million.

The PRES project will support the upstream gas industry in using clean electricity instead of fossil fuels to power their equipment and operations. This includes new natural gas processing facilities in the Montney basin that are being constructed by multiple companies.

The Parkland Gas Plant Electrification Project reduces GHG emissions by using electricity provided by the integrated BC Hydro Grid to power compressors and other equipment at the Parkland Gas Plant instead of the use of self-generated electricity. GHG emissions from fuel gas will be reduced by the project by avoiding natural gas combustion for gas compression applications and other electrical loads at the facility through the interconnection of the facility to BC's low carbon electric grid to power the electric engines that drive the compressor. Data related to these activities will be directly monitored, and calculations performed based on the Fuel Switch Protocol and ISO 14064-2, to ensure that an accurate and conservative assessment of the corresponding emission reductions will be achieved. The project is estimated to reduce about 79,000 t CO₂e per year which is equivalent to removing 17,000 cars off the road for a year

In another similar fuel switch project at Sunrise Gas Plant in the Montney formation, the project is estimated to reduce about 52,000 t CO₂e per year which is equivalent to keeping off 11,200 cars off the road for a year. When the capacity of the new PRES line is fully subscribed, PRES will avoid up to 2.6 million tonnes of greenhouse gas (GHG) emissions per year which is equivalent to removing 560,000 cars off the road for a year and enable the electrification of approximately 3.7 billion cubic feet per day of natural gas production.



Electrification of Parkland Gas Plant

Emissions and offset summary table

Declaration statement: This Carbon Neutral Action Report for the period January 1, 2019 to December 31, 2019 summarizes our emissions profile, the total offsets to reach net-zero emissions, the actions we have taken in 2019 to reduce our greenhouse gas emissions and our plans to continue reducing emissions in 2020 and beyond.

BC Hydro GHG emissions and offset for 2019	
As per the Directive issued March 31, 2020, BC Hydro will use 2018 GHG emissions as a placeholder for the purposes of BC Hydro 2019 CNAR.	
Total emissions (t CO ₂ e)	33,615 t CO ₂ e
Total offsets (t CO ₂ e)	32,820 t CO ₂ e
Grand total offsets for the 2019 reporting year	
Grand total offsets (t CO ₂ e)	32,820 t CO ₂ e

Retirement of offsets:

In accordance with the requirements of the Climate Change Accountability Act and Carbon Neutral Government Regulation, BC Hydro (the Organization) is responsible for arranging for the retirement of the offsets obligation reported above for the 2019 calendar year, together with any adjustments reported for past calendar years (if applicable). The Organization hereby agrees that, in exchange for the Ministry of Environment and Climate Change Strategy ensuring that these offsets are retired on the Organization's behalf, the Organization will pay within 30 days, the associated invoice to be issued by the Ministry in an amount equal to \$25 per tonne of offsets retired on its behalf plus GST.

Executive sign-off:

May 29, 2020



Chris O'Riley, President & CEO

