

# Fraser Health's 2019 Carbon Neutral Action Report



# Declaration Statement

This Carbon Neutral Action report for the period January 1st, 2019 to December 31st, 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.

By June 30, 2020 Fraser Health's final Carbon Neutral Action report will be posted to our website at [bcgreencare.ca](http://bcgreencare.ca)

# Retirement of Offsets

In accordance with the requirements of the Climate Change Accountability Act and Carbon Neutral Government Regulation, Fraser Health is responsible for arranging for the retirement of the offsets obligation reported for the 2019 calendar year, together with any adjustments reported for past calendar years. Fraser Health 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, Fraser Health 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.

The cover photo was taken by Jeson Mak in 2019 from Columbia Tower of Royal Columbian Hospital in New Westminister overlooking the Health Care Center, new Mental Health building (under construction) and Port Mann Bridge on Fraser River.

# COVID-19 Pandemic Statement

Due to the COVID-19 pandemic, the following [Directive](#) was issued on March 31, 2020:

“Under my authority as the Director for the purposes of the Act, and under the authority delegated to me in Section 6 of the Carbon Neutral Government Regulation, I hereby direct that 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.”

Neil Dobson, Executive Director, Clean BC Implementation  
Climate Action Secretariat

Although 2018 emissions data will be used as a placeholder for 2019, all other qualitative components of this CNAR are to be completed with information from 2019

This document provides guidance to provincial public sector organizations (PSOs) to help them prepare their 2019 Carbon Neutral Action Report (CNAR) in accordance with BC’s Climate Change Accountability Act and the Carbon Neutral Government Regulation.

# Executive Summary



## Executive Summary: Fraser Health Carbon Neutral Action Report 2019

Victoria Lee, President and Chief Executive Officer

I am proud to present Fraser Health's 2019 Carbon Neutral Action Report.

This marks the tenth consecutive year we have achieved carbon neutrality as part of the Province of British Columbia's public sector commitment to net-zero emissions.

Health care is an energy-intensive industry that continues to grow with expanding and aging populations. Fraser Health's 2019 total emission was 37,384 tonnes of carbon dioxide equivalent. In 2019, 24 mechanical and lighting retrofit projects were initiated, that together saved Fraser Health an estimated 3 gigawatt hours (GWh) or 10,700 gigajoule (GJ) of energy, thereby reducing our carbon footprint by 413 tonnes of CO<sub>2</sub>.

In addition, we continue to support staff engagement programs and the Green+Leaders program, which encourages a work culture of energy conservation.

To counteract the 2019 CO<sub>2</sub> emissions that we were unable to reduce through conservation measures, we purchased carbon offsets from the Ministry of Environment at a total cost of \$980,385.00.

Thank you to all our staff, medical staff and volunteers, as well as key external partners, for their hard work to reduce Fraser Health's environmental and carbon footprint. We know every individual can make a difference. By working together, we are able to provide both quality care and a greener health care environment for our patients and our community.



**Dr. Victoria Lee**

President and Chief Executive Officer  
Fraser Health

# Our CO<sub>2</sub> Footprint

As per the Directive issued March 31, 2020, each Public Sector Organization (PSO) will use their 2018 Greenhouse Gas (GHG) Emissions as a placeholder for the purposes of their 2019 CNAR.

## 2019 Greenhouse Gas Emissions Breakdown and Offsets Applied to Become Carbon Neutral

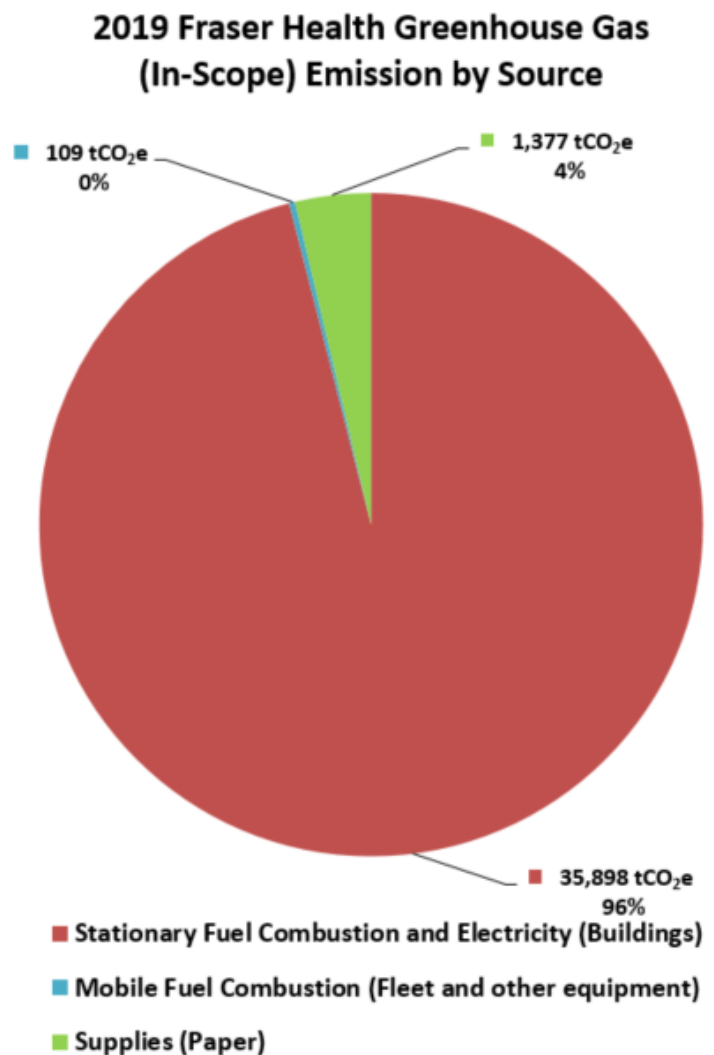
We report our carbon footprint based on guidelines provided by the Carbon Neutral Government Regulation and Climate Action Secretariat in British Columbia.

The Climate Action Secretariat uses various elements of reporting, based on the Greenhouse Gas Protocol Corporate Standard, which has classified carbon reporting into three scopes. Of these three scopes and various elements within each scope, the Climate Action Secretariat has determined Fraser Health's carbon footprint comprises six different greenhouse gases that are converted to tonnes of carbon dioxide equivalent (tCO<sub>2</sub>e). The main sources of emissions are categorized into three main groups:

- Stationary Fuel Combustion and Electricity (Buildings)
- Mobile Fleet Combustion (Fleet and other equipment)
- Supplies (Paper)

The total emissions for 2019 was 37,384 tCO<sub>2</sub>e. As shown in the chart, 96 per cent of Fraser Health's in-scope emissions are attributed to the stationary fuel combustion and purchased energy (electricity) from the Fraser Health owned and leased buildings.

To become carbon neutral in 2019, Fraser Health purchased carbon offsets from the Ministry of Environment. Fraser Health's 2019 total offsets were 36,348 tCO<sub>2</sub>e at a total cost of \$980,385.00.





The table below shows the breakdown of emission and offset for 2019.

<b>Fraser Health Green House Gas Emissions and Offsets for 2019</b>	
<b>As per the <u>Directive</u> issued March 31, 2020, each PSO will use their 2018 Greenhouse Gas Emissions as a placeholder for the purposes of their 2019 CNAR.</b>	
Total Emissions (tCO2e)	37384
Total BioCO2	35.6
Total Offsets (tCO2e)	37348
Offset Investment (\$25 per tCO2e) [Total Offsets x \$25/tCO2e]	\$933,700.00 (\$980,385.00 including GST)

Notes for above table:

- i. Note, BioCO2 is reported in Total Emissions but not Total Offsets
- ii. Prior Year Adjustments (PYAs) are not applicable as emissions and offsets are based on 2018 alone
- iii. Total emissions and offset invoice amounts will be validated by CAS prior to distributing invoices
- iv. Due to a variety of influences including historical data corrections and conversion factors, there may be minor discrepancies between data existing in Clean Government Reporting Tool (CGRT) vs SMARTTool

The carbon emissions reported are not adjusted for changes in weather temperature or usable space. Stationary Fuel (natural gas) emission is the majority of the building overall emissions since the lower mainland has a climate that predominately requires heating to satisfy internal building temperatures. Although the priority climate mitigation actions are focused on natural gas combustion reductions, there are many drivers to continue reducing purchased energy and other emission sources.

# Actions Taken To Reduce Our CO<sub>2</sub> Footprint

## Stationary Emissions (Buildings)

- **Further reduced environmental impact by initiating 24 retrofit projects** with a total estimated energy savings of 3 GWh (10,700 GJ) resulting in greenhouse gas savings of 413 tCO<sub>2</sub>e.
- **Fully utilized the Carbon Neutral Capital Program** to fund the energy / greenhouse gas emission reduction project at Eagle Ridge Hospital and Peace Arch Hospital. About \$1 million of Carbon Neutral Capital Program funds, along with internal capital funds and incentives, were invested in F20.
- **Invested \$432,000 from the Green Revolving Fund** in electricity energy saving projects in F20.
- **Completed lighting audits** at Eagle Ridge Hospital, Mission Hospital, Chilliwack General Hospital, Delta Hospital, Fellburn care Center and Maple Ridge Treatment Centre.
- **Completed Low Carbon Electrification study** at Heritage Village.
- **Embarked on Medical Device Reprocessing sterilizer heat recovery study** at Delta Hospital, Ridge Meadows Hospital and Burnaby Hospital.
- **Continued to roll out an engagement strategy** with Facilities Maintenance and Operation (FMO), adding Surrey Memorial Hospital to the list of seven Fraser Health sites in the engagement program. The strategy focuses on energy performance, identifying conservation opportunities and optimizing existing plants or equipment in buildings.

- **Continued to embed sustainability** by supporting staff engagement initiatives such as the Green+Leaders program, the GreenCare community website, and the BC Hydro Energy Wise program.
- **Engaged in New Construction and Major Renovation Projects** such as Peace Arch Hospital Expansion, Delta Hospital lab and Medical Imaging Expansion, and Mental Health building in Royal Columbian Hospital with the intent to ensure that health care-related new buildings build to the meet highest standards for environmental and human health, performance efficiency, and financial investment.

## Mobile Fleet & Other Vehicles Combustion

- Communicated with **supply chain** about the CleanBC plan to encourage the uptake of electric vehicles in fleet
- Fraser Health now has **60 electric vehicles charging stalls** in visitor/employee parking.
- There are **470 bike-parking stalls** available across Fraser Health sites.
- **Continued the shuttle transport service for family members, ambulatory patients, and employees** between three facilities and the Surrey Central Skytrain Station, Royal Columbian Hospital and Braid Station, and Burnaby Hospital and Gilmore/Patterson Stations. Ridership was 156,125 trips, an increase of 23% over 2018.
- **Transit Incentive Program (TIP)** was implemented effective November 1st, 2019 with 298 Fraser Health employees enrolled in the first month. Employees

receive a 15 per cent subsidy if they purchase a Monthly Compass Card.

## Supplies (Paper)

- As part of the waste reduction campaign, the Fraser Health Green Leader program was supplied with toolkits to reduce paper use through double-sided printing, paperless meetings, and more.
- **GreenCare Community** website continues to provide inspiration, tips and toolkits to reduce waste, including paper use.



# Actions That Fall Outside the Scope of the Carbon Neutral Government Regulation

- Worked with BC Hydro to consolidate all individual site bills into one bill to **reduce mailing of paper invoices**.
- **A Wastewater Pollution Prevention Plan was created for nine Fraser Health sites as required by Metro Vancouver.** These plans form a commitment to reduce the amount of hazardous chemicals, grease or solids that could get into the sewer system.
- **The Facility Management Energy Environment and Sustainability team** collaborated with Provincial Health Services Authority supply chain to create a formal way for frontline health care staff to report an **“environmental concern”** with regards to a product they use to deliver patient care. Identifying concerns such as “not recyclable” and “excessive packaging” will help PHSA Supply Chain procure environmentally preferable products and equipment, for all hospitals in BC, including Fraser Health.
- **Education and awareness on [GreenCare](#) community website**, as well as stories published on our internal communication channels, continued to promote behaviour change and celebrate environmental sustainability success.
- **Continuing to support staff champions through the Green+Leaders program** in training, resources, toolkits, and recognition. In 2019:
  - The Program **collaborated with the Fraser Health Innovation Team** who sponsor annual innovation grants. The 2019 innovation grants had a special focus on “exnovation”: for creative solutions that eliminate unnecessary steps, waste and/or costs, while maintaining or improving the standard of care. \$3,000 was dedicated to Green+Leaders to implement projects that eliminate waste across Fraser Health.
- **Zero waste** initiative by Fraser Health staff, to reduce our hospitals’ environmental impact: In 2019 a Green+Leader nurse at Peace Arch Hospital provided frontline staff in 33 hospital areas with face-to-face education on recycling best practices. Follow-up visual audits showed a significant decrease of recycling bin contamination in staff areas such as kitchens and lunch rooms.
- **The BC Climate Change Accountability Act gave equal importance to climate risk management alongside greenhouse gas emission reductions.** Fraser Health is already mandated or committed to:
  - Participated the 8th annual Public Sector Climate Leadership Symposium on November 2019
  - Demonstrate public sector leadership, and achieve new greenhouse gas emission reductions targets, as per CleanBC (2018).
  - Report climate risks and actions to reduce risks in Carbon Neutral Action Reports.
  - Conduct net zero energy assessment for capital projects, as per the Ministry of Health (2018).
  - Produce 10-year emission reduction and adaptation plans, as per the Climate Leadership Plan (2016).
  - By 2022, conduct an integrated climate and health vulnerability assessment, and develop an integrated climate adaption plan, with a Health Canada grant.
  - Develop an executive summary report series called “Moving Toward Climate Resilient Health Facilities” to introduce the topic of Fraser Health and future climate, understand the risks to patient care and facilities and discuss how to reduce risk.

# Future Actions to Reduce Our CO<sub>2</sub> Footprint

Fraser Health plans to continue reducing its CO<sub>2</sub> footprint with a focus on in-scope emission and strategic planning.

## In-scope Emissions

The majority of Fraser Health's carbon footprint is related to stationary fuel combustion in its owned and leased buildings. Natural gas is the predominant fossil fuel used for space heating, hot water, and process loads in our stationary combustion plants. Although our priority actions are to focus on our natural gas combustion plant, we are also motivated to reduce purchased energy (electricity) and other in-scope emission sources.

### Stationary Fuel Combustion and Electricity (Buildings)

- **Review greenhouse gas performance accountability options** and target design standard such as **Leadership in Energy and Environmental Design (LEED)** with new construction and expansion project team.
- **Setting up long term plan** to achieve new greenhouse gas emission reductions targets as per CleanBC
- **Initializing Net Zero Emissions and Energy Feasibility discussion** with the Royal Columbian Hospital Re-development and new Surrey Hospital project at initial phase and increase collaboration focus in all project phases.
- **Building partnerships with cities and municipalities** to investigate district energy systems opportunities that enable alternative energy solutions for existing buildings or new constructions.
- **Planning and implementing greenhouse gas or energy reduction projects** in our existing buildings portfolio by using the Carbon Neutral Capital Program and supplementing with internal capital funds and incentives from BC Hydro and FortisBC.
- **Continuing the optimization of mechanical plants, lighting, and building controls** in our existing building portfolio.
- **Reinvesting electricity savings** from the previous fiscal year to supplement the Green Revolving Fund and invest in electricity reduction projects.
- **Undertaking existing site energy studies** with support from facilities maintenance operations employees and external consultants to identify greenhouse gas / energy reduction opportunities.
- **Collaborate with building operators and engineers** to identify greenhouse gas reduction opportunities and tracking building performance.
- Continue to **engage and educate Fraser Health employees**, through the Green+Leaders program, GreenCare Community.

### Mobile Combustion (Fleet and Other Vehicles)

- Continuing to work with Fleet Procurement and transportation demand management coordinator to improve, promote, and establish low carbon transportation opportunities.

### Supplies (Paper)

- Collaborating with BC Clinical and Support Services stakeholders and our paper suppliers about procurement of environmentally friendly and high recycled content paper. There is an ongoing effort across the organization to minimize use of paper in day-to-day workflow.

# Feature Project Lesson

## Celebrating New Technologies through Performance Commissioning

In 2019, the Energy and Environmental Sustainability Team worked closely with the Eagle Ridge Hospital Facilities Maintenance and Operation (FMO) team, to maximize the potential of a powerful new Heat Recovery Chiller (HRC) installed at the hospital.

Eagle Ridge Hospital is a community hospital, located in Port Moody. It was constructed in 1982 to provide primary and secondary care with some specialty services with an additional Extended Care Unit for seniors built in 1992. An earlier energy study showed the existing chillers were over-sized and performed poorly in fall and spring when the cooling load is small.

The project goals were to improve overall heating and cooling efficiency and capture escaping energy from the exhaust air to reduce greenhouse gas emissions by

- installing a 250-ton HRC, replacing three of the six standard multi-stack chillers;
- connecting the heat recovery chiller to exhaust duct heat recovery coils;
- installing variable speed drives on hot water pumps;
- implementing advance control strategy to optimize the system performance.

The HRC is a dynamic machine that responds to both heating and cooling systems that change throughout the day and year leading to impressive energy efficiency. It can achieve greater efficiency by ramping down at low loads supported by variable speed pumps that can lower the flow of chilled water. The heating feature displaces natural gas that would otherwise be burned by boilers for heating. As well, the HRC can capture and re-use heat from exhausted warm air in the winter for space heating and to heat domestic hot water. This complexity requires the well-tuned, integrated operation of all systems; otherwise, the energy efficiency potential is lost. The installation funding was supported by BC's Carbon Neutral Capital.



**Figure 1: New Heat Recovery Chiller**

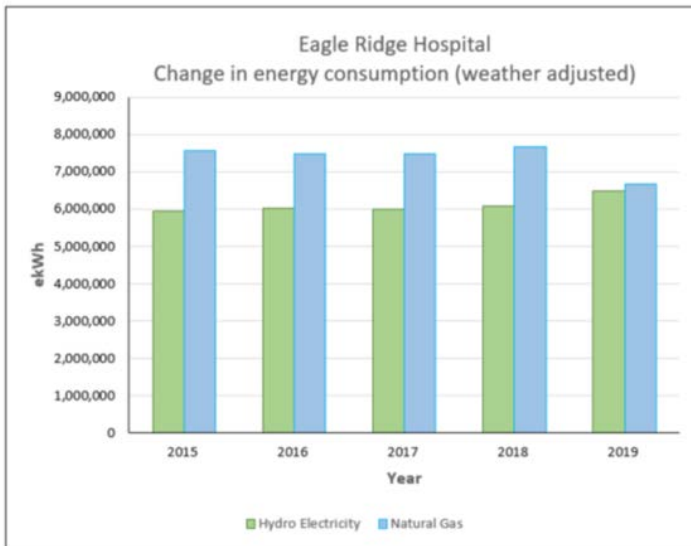


**Figure 2: Three remaining Multi-stack chillers**

After the unit was successfully installed and in operation, the Hospital's Facilities Team noted the HRC was not always performing as intended. This observation was brought to the energy team's attention.

In the winter of 2019, the energy team engaged the original designer of the HRC system for "performance commissioning". By observing how the HRC is actually performing after the first summer and winter season, the designer was able to adjust programming parameters. As a result, the HRC's winter operation is more stable, with less downtime and the average HRC operation has increased from 50 to 80 per cent of its full capacity. The designer will perform the same optimization for summer operation.

Eagle Ridge Hospital saved 3,633 GJ (13%) in natural gas in 2019, representing a decrease of 185 tons of CO<sub>2</sub> emissions. The savings came from a 7,000 GJ reduction due to heat production of the HRC, minus additional ventilation heating load. The increase in electricity use of 419,000 kWh was expected. Following the adjustments, initial trending of performance data shows the hospital expects to more than double the gas savings due to the HRC, for an overall cost savings of \$50,000 per year.



**Table 1: This chart shows natural gas reduction (blue) in 2019, compared to previous years, with an increase in electricity consumption due to the Heat Recovery Chiller.**

By following up with a Performance Recommissioning effort, the hospital was able to get the full potential of its new heat recovery chiller to maximize energy savings, improve control of the indoor environment and give operators confidence in their new equipment.

The building is currently in the process of upgrading the patient rooms’ ventilation system by replacing the pneumatically controlled “mixing boxes” with new digitally controlled “variable air volume” (VAV) boxes. This is a multi-year project, due for completion in 2021. The HRC performance commissioning enables the optimization of the strategic control of the new VAV boxes system to further improving energy savings and occupants’ comfort.