

Fraser Health 2018 CARBON NEUTRAL ACTION REPORT



Declaration Statement

This Carbon Neutral Action report for the period January 1st, 2018 to December 31st, 2018 summarizes our emissions profile, the total offsets to reach netzero emissions, the actions we have taken in 2018 to reduce our greenhouse gas emissions, and our plans to continue reducing emissions in 2019 and beyond.

By June 30, 2019 Fraser Health's final Carbon Neutral Action report will be posted to our website at bcgreencare.ca.



Retirement of Offsets

In accordance with the requirements of the Greenhouse Gas Reduction Targets Act and Carbon Neutral Government Regulation, Fraser Health (the Organization) is responsible for arranging for the retirement of the offsets obligation reported for the 2018 calendar year, together with any adjustments reported for past calendar years. 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 Summary

Fraser Health, CNAR 2018

According to the World Health Organization, climate change is the greatest threat to global health in the twenty-first century.

Given the significant health impacts of global environmental change, Fraser Health is committed to reducing our environmental footprint, protecting our workplaces and communities, and promoting internal policies that mitigate current and future impacts of environmental change. To this end, I am proud that this report marks the ninth 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. In 2018 Fraser Health saw continued growth in the Green+Leaders program with 1422 staff participating, and a 37 per cent increase in sustainability education. Fraser Health's 2018 carbon footprint was 37,384 tonnes of carbon dioxide equivalent. Compared with 2017, Fraser Health's carbon dioxide (CO₂) emissions have decreased by 7.8 per cent. We accomplished this decrease in emissions in 2018 by initiating 24 mechanical and lighting retrofit projects that

saved Fraser Health an estimated 4.1 gigawatt hours (GWh) or 14,873 gigajoule (GJ) of energy, thereby reducing our carbon footprint by 583 tonnes of CO₂.

To counteract the 2018 CO₂ emissions that we were unable to reduce through conservation measures, we purchased carbon offsets from the Ministry of Environment at a total cost of \$952,166.

Thank you to all our employees, physicians 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, families and our communities.



Victoria Lee
President & Chief Executive Officer

Our CO₂ Footprint

2018 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 (tCO₂e). The main sources of emissions are categorized into three main groups:

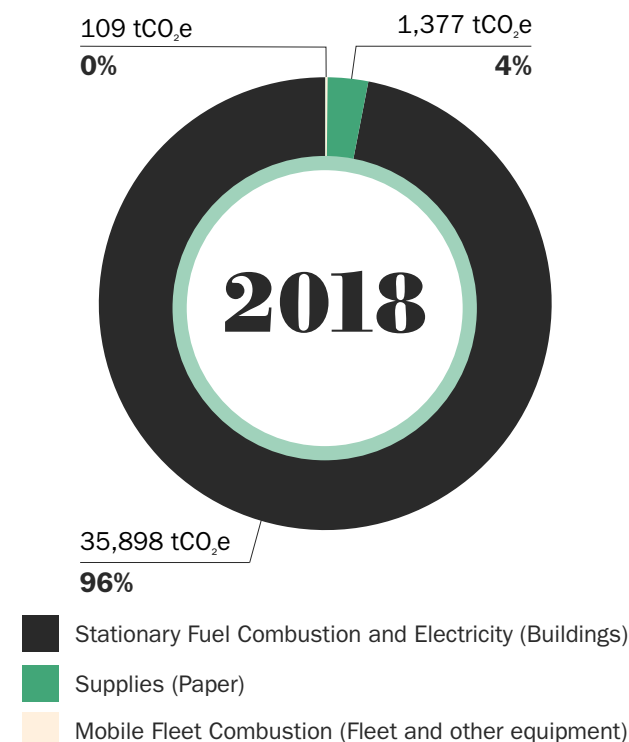
- 1 Stationary Fuel Combustion and Electricity (Buildings)
- 2 Mobile Fleet Combustion (Fleet and other equipment)
- 3 Supplies (Paper)

The total carbon footprint for 2018 was 37,384 tCO₂e. 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 our buildings.

To become carbon neutral in 2018, Fraser Health purchased carbon offsets from the Ministry of Environment. Fraser Health's 2018 carbon offsets were 36,237 tCO₂e including -1,075 tCO₂e adjustment from 2017 at a total cost of \$906,825.

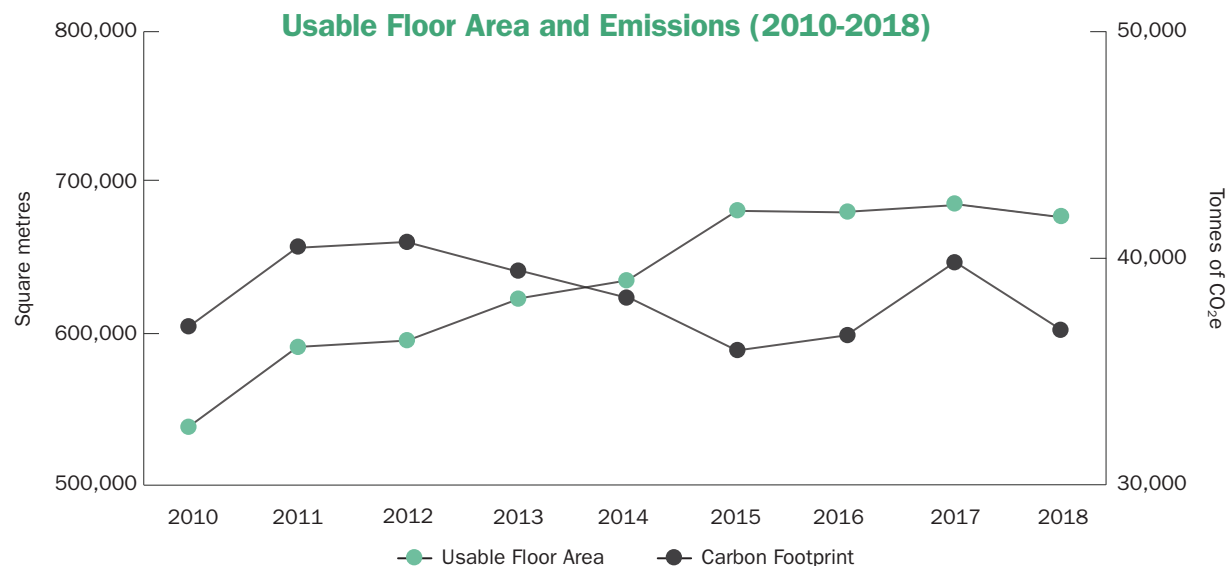


FHA Greenhouse Gas (In-Scope) Emission by Source



Changes to Fraser Health Care's Portfolio

The carbon emissions reported are not adjusted for changes in weather temperature or usable space. Vancouver and the Fraser Valley have a climate that predominately requires heating to satisfy internal building temperatures. The use of Heating Degree Days (HDD) is a method designed to reflect the demand for energy required to heat a building. In 2018, there was a 5.3 per cent decrease of HDD to 2,768 from 2,922 while Fraser Health's useable facility space increased slightly by 0.3 per cent.



FRASER HEALTH PORTFOLIO					
BUILDINGS, FTE AND WEATHER	2007	2015	2016	2017	2017
Distinct Fraser Health Buildings	n/a	151	153	147	151
% Owned	n/a	82%	81%	83%	83%
% Leased	n/a	18%	19%	17%	17%
Usable Square Meters ^a	538,274	681,264	686,942	676,239	678,572
Full-Time Employee Equivalents ^b	14,029	17,997	18,298	18,332	18,332
Weather Heating Degree Days ^c	2,870	2,490	2,537	2,922	2,768

a. Usable area excludes roof tops, interstitial spaces and parking areas.

b. Full-Time Employee data is provided by Ministry of Health.

c. The Heating Degree Days are taken from Vancouver Airport using a base temperature of 18°C.

Changes to Fraser Health Care's Portfolio

Heating Degree Days (HDD) has a major effect on the carbon emissions due to the natural gas consumption of the facilities combustion heating plant. In 2018, the building usable area has a very small increase of 0.3% from 2017, the Carbon Offsets decreased by 7.8 per cent while the HDD decreased by 5.3 per cent. The difference has largely been due to the increase of thermal efficiency related to energy retrofit and conservation programs in our existing buildings and the integration of high energy efficiency guidelines standards in new buildings.

FRASER HEALTH						
OUR CARBON FOOTPRINT (IN tCO ₂ e)		2007	2015	2016	2017	2018
CO ₂	Mobile Fuel Combustion	136	106	114	100	109
	Stationary Fuel Combustion and purchased Energy (electricity)	35,404	34,875	35,948	39,324	35,898
	Supplies (paper)	1,056	1,434	1,081	1,123	1,377
	Total Emissions^a	36,596	36,415	37,143	40,547	37,384
	Total BioCO ₂ (No Offsets Required) ^b	-8	-19	-20	-22	-36
	Total Offsets ^c	36,587	36,396	37,124	40,525	37,348
	Adjustments from Prior Years		-15	12	28	-1,075
	Grand Total Offsets Required		36,381	37,136	40,553	36,273
\$	Total Offset Investment		\$909,525	\$928,400	\$1,013,825	\$906,825
	Total Offset Investment + GST		\$955,001	\$974,820	\$1,064,516	\$952,166
KPI	Emissions per Full-Time Employee	2.61	2.02	2.03	2.21	2.00
	Emissions per Meter Square Facility Space	0.068	0.053	0.054	0.060	0.055

a. It was estimated that Fugitive Emissions from cooling equipment do not comprise more than 0.01 per cent of Fraser Health's total emissions and have been deemed out-of-scope and have not been included in our total greenhouse gas emissions profile.

b. As outlined in the Carbon Neutral Government Regulation of the Greenhouse Gas Reductions Target Act, some emissions do not require offsets.

c. Total emissions from previous years are subject to minor adjustments / corrections following analysis by CAS.

Actions Taken to Reduce Our CO₂ Footprint

Stationary Emissions (Buildings)

- **Further reduce environmental impact by initiating 24 retrofit projects** with a total estimated energy savings of 4.1 GWh (14,873 GJ) resulting in greenhouse gas savings of 583 tCO₂e.
- **Fully utilized the Carbon Neutral Capital Program** to fund the energy / greenhouse gas emission reduction project at Eagle Ridge Hospital, Fraser Canyon Hospital, and Queens Park Care Center. Over \$1 million of Carbon Neutral Capital Program funds, with internal capital funds and incentives, were invested. About two-thirds of the above greenhouse gas savings are a result of this project.
- **Invested \$406,000 from the Green Revolving Fund** in electricity energy saving projects.
- **Completed energy study** at Langley Memorial Hospital, demand response study at Fraser Canyon Hospital and BC Hydro Optimization study at Jim Pattison Outpatient Care and Surgery Centre. Embarked on lighting study at Eagle Ridge Hospital, Mission Hospital, Chilliwack General Hospital and Delta Hospital.
- **Continued to roll out an engagement strategy** with facilities maintenance and operations, adding Ridge Meadows Hospital and Langley Memorial Hospital to five existing sites. The strategy focuses on energy use in buildings, identifying reduction opportunities and optimizing existing plants or equipment.
- **Continuing to embed sustainability** across the organization by supporting staff engagement initiatives such as the Green+Leaders program, the GreenCare community website, and the BC Hydro Energy Wise program.
- **Updated our Energy and Environmental Sustainability Design Guidelines for New Construction and Major Renovation Projects** with the intent to ensure that health care related new construction and major renovation projects are built to the highest standard of environmental and financial investment.

Mobile Fleet & Other Vehicles Combustion

- **Installed and activated eight more electric vehicle charging stations** in Burnaby Hospital for a total of 64 stations across Fraser Health.
- 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 is planned for 2019. In 2018, the shuttles facilitated the transfers of 127,002 people, an increase of 29 per cent over last year.

Supplies (Paper)

- **There are 94 trained volunteers in the Fraser Health Green+Leader program.** As part of the waste reduction campaign, they were 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. Fraser Health has 1,422 staff registered for the GreenCare Community in 2018.

Actions That Fall Outside the Scope of the Carbon Neutral Government Regulations

- **The Lower Mainland Energy Environment and Sustainability team provided in-person education** to 1,589 employees on waste management processes. 1,571 employees completed the online Waste Management Basics course, 37 per cent more than last year.
- **Education and awareness communications via the GreenCare Community website**, as well as stories published on our internal communication channels, continued to promote behavior change and celebrate environmental sustainability success.
- **Support staff champions through the Green+Leaders program** in training, resources, toolkits, and recognition.
- **In 2018, the updated BC Climate Change Accountability Act positioned climate risk management alongside greenhouse gas (GHG) emissions reductions.** Fraser Health is already mandated or committed to:
 - Demonstrate public sector leadership, and achieve new GHG 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.
- **Developing a report series for executive summary of “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 reducing of such risk.

Future Actions to Reduce Our CO₂ Footprint

Fraser Health plans to continue reducing its CO₂ 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 (GHG) Performance accountability options** and target design standard such as Leadership in Energy and Environmental Design (LEED) with Peace Arch Hospital and Langley Memorial Hospital Expansion project team.
- **Undertake Net Zero Emissions and Energy Feasibility studies** for all new build projects at concept phase and increase collaboration focus in all project phases.

- **Building partnerships with cities and municipalities** to investigate district energy systems opportunities with alternative energy solutions. The Royal Columbian Hospital redevelopment and new energy center is being designed with the option to connect to a district energy systems (DES).
- **Planning and implementing greenhouse gas / 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 GHG reduction opportunities and tracking building performance.
- Continue to **engage and educate Fraser Health employees**, through the Green+Leaders program, GreenCare Community and BC Hydro Energy Wise program.

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 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 work flow.



Success Story

In 2018, Chilliwack General Hospital (CGH) set out to accomplish important upgrades in kitchen heating and ventilation equipment, and save on energy costs, without disrupting the provision of healthy meals and domestic hot water to patients.

Fraser Health celebrated the success of this project. Planning, ingenuity and close collaboration between the Energy and Environmental Sustainability team (EES), contractors and the Facilities Maintenance and Operations (FMO) team at CGH was important in overcoming challenges throughout the project. The project goals were:

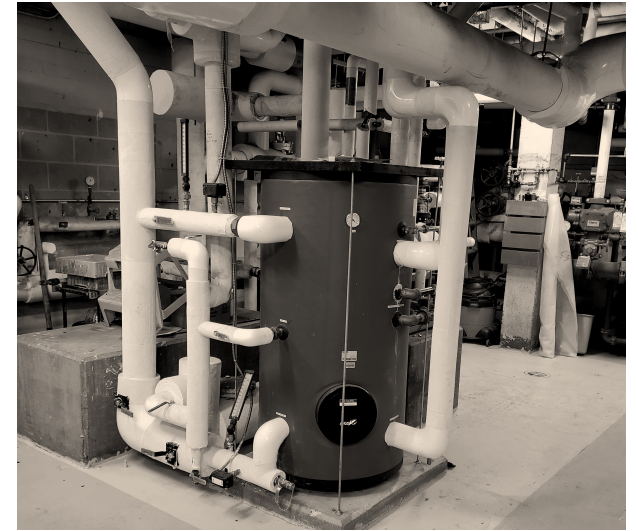
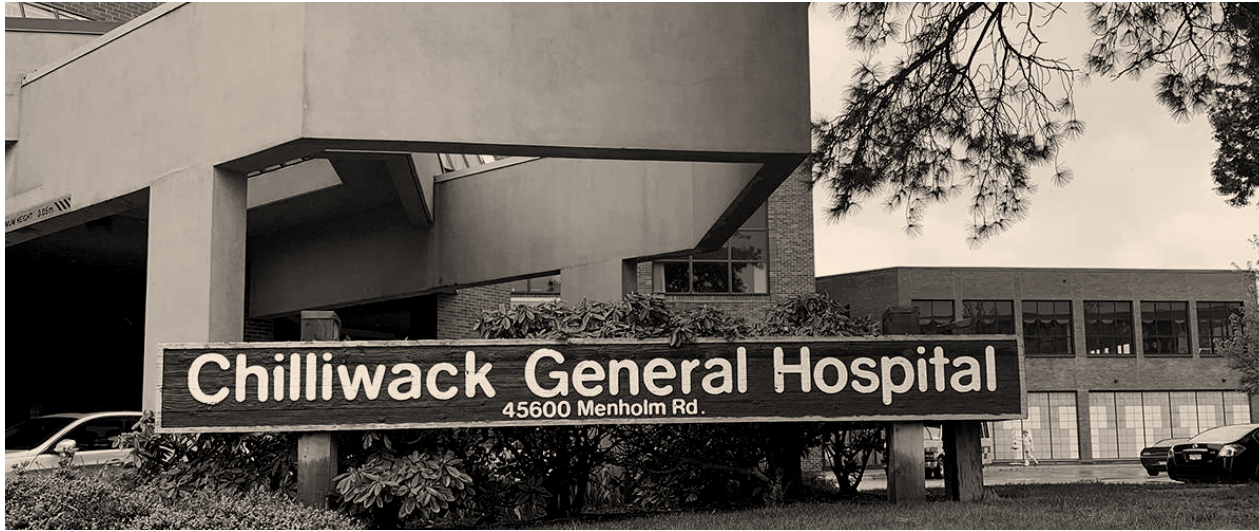
- Upgrade controls on the main hospital kitchen ventilation system, to increase system efficiency.
- Upgrade the Main Hospital kitchen's domestic hot water system to include heat recovery.

- Install variable frequency drives to pumps on the hot water heating system.
- Upgrade ventilation system controls at CGH Parkholm Place.
- Install insulation to exposed steam and condensate pipework and valves to reduce heat loss.

The installation of these measures was completed in 2018 with funding from BC's Carbon Neutral Capital Program. The total expected annual energy savings are 3,285 GJ of natural gas and 81,950 kilowatt hours of electricity equivalent to a total carbon reduction of 165 tCO₂e /year. Financially, these measures will save the hospital \$35,500 in annual gas, electricity and carbon offset costs.

Automating kitchen ventilation

Since the original ventilation system for the kitchen ran at full speed, 24 hours a day, energy savings could be realized by adding controls to vary fan speed to exhaust cooking smells, heat and moisture as needed. First, a variable frequency drive was installed onto the kitchen range hood fan along with added heat sensors inside the hood. Then, the FMO worked closely with the engineer and contractors to add a new interconnection to the dishwasher wash-down cycle. Thus, the control system could reliably reduce ventilation to 50 per cent at night, but still ramp up to 100 per cent when needed, for the dishwasher cycle. Installation and testing were performed after-hours, to not disrupt kitchen operations.



Success Story

Pre-heat domestic hot water with recovered heat

Major savings were also possible with the domestic hot water system. The challenge was to maintain production of hot water at all times. Two new steam-to-water heat exchangers plus a tank for heat recovery from steam condensate all needed to be in place, tested and operational, with the old system still operating before initiating the changeover. Space in the mechanical room was limited. With careful planning, the actual changeover took place seamlessly, requiring a few hours of shutdown after midnight, with no disruption to the hot water supply.

Success Story

The charts show the resulting energy savings from the project. Electricity and natural gas savings continue to accumulate over time since August 2018.

Chilliwack General Hospital now has new energy efficiency equipment, and is saving on operating costs while reducing GHG emissions. Close cooperation between Energy Environment and Sustainability, Facilities Maintenance and Operations, and contractors ensured a successful project under challenging conditions.

