

Fraser Health's 2017 Carbon Neutral Action Report



Declaration Statement

This Carbon Neutral Action report for the period January 1st, 2017 to December 31st, 2017 summarizes our emissions profile, the total offsets to reach net-zero emissions, the actions we have taken in 2017 to reduce our greenhouse gas emissions, and our plans to continue reducing emissions in 2018 and beyond.

By June 30, 2018 Fraser Health's final Carbon Neutral Action report will be posted to our website at bcgreencare.ca

The cover photo is taken from Royal Columbian Hospital in New Westminister overlooking the Fraser River and City of Surrey.

Executive Summary



Executive Summary: Fraser Health Carbon Neutral Action Report 2017

Michael Marchbank, President and Chief Executive Officer

I am proud to present Fraser Health's 2017 Carbon Neutral Action Report.

This marks the eighth 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 2017 carbon footprint was 40,547 tonnes of carbon dioxide equivalent. Despite a 15 per cent increase in heating demand compared with 2016, Fraser Health's carbon dioxide (CO₂) emissions have only increased by nine per cent. We accomplished this minimal increase in emissions in 2017 by initiating 23 mechanical and lighting retrofit projects that saved Fraser Health an estimated 5.1 gigawatt hours (18,240 gigajoule) of energy, thereby reducing our carbon footprint by 617 tonnes of CO₂.

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

To counteract the 2017 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 \$1,064,516.

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 and our community.

A handwritten signature in black ink, appearing to read 'M. Marchbank', written in a cursive style. Below the signature is a horizontal line.

Our CO₂ Footprint

2017 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:

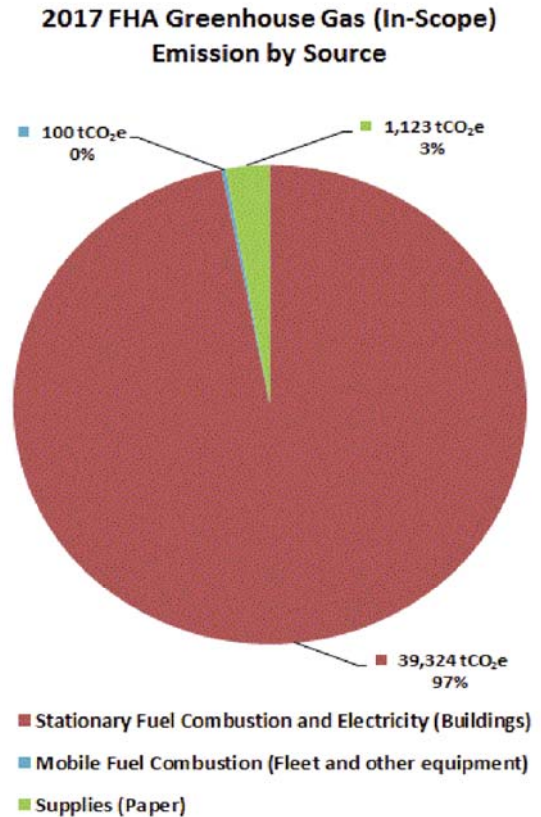
- Stationary Fuel Combustion and Electricity (Buildings)
- Mobile Fleet Combustion (Fleet and other equipment)
- Supplies (Paper)

The total carbon footprint for 2017 was 40,547 tCO₂e. As shown in the chart, 97 per cent of Fraser Health's in-scope emissions are attributed to the stationary fuel combustion and purchased energy from our buildings.

To become carbon neutral in 2017, Fraser Health purchased carbon offsets from the Ministry of Environment. Fraser Health's 2017 carbon offsets were 40,553 tCO₂e including 28 tCO₂e adjustment from 2016 at a total cost of \$1,064,516.

Changes to Fraser Health's Portfolio

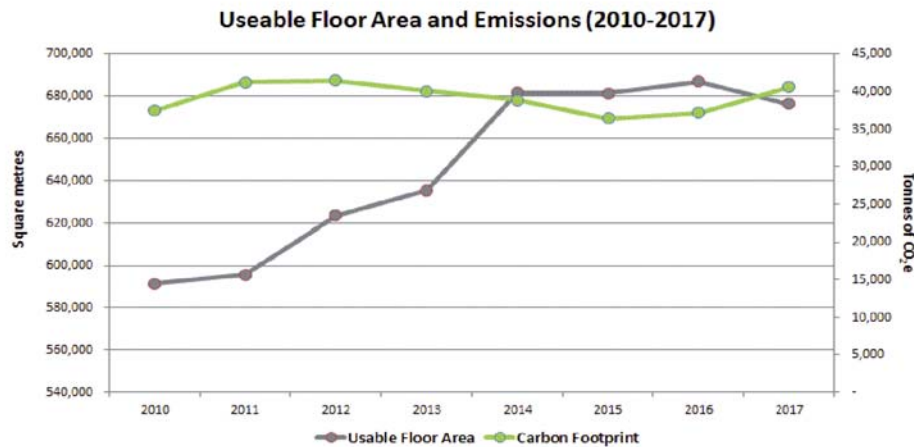
The carbon emissions reported are not adjusted for changes in weather temperature or usable space. Vancouver and the Fraser Valley have a climate that predominately requires heating to satisfy internal building temperatures. The use of Heating Degree Days (HDD) is a method designed to reflect the demand for energy required to heat a building. In 2017, there was a significant 15 per cent increase of HDD to 2,922 from 2,537 while Fraser Health's useable facility space decreased slightly by 1.6 per cent.



Fraser Health Portfolio

BUILDINGS, FULL-TIME EMPLOYEE AND WEATHER	2007	2014	2015	2016	2017
Distinct Fraser Health Buildings:	n/a	153	151	153	147
% Owned:	n/a	82%	82%	81%	83%
% Leased:	n/a	18%	18%	19%	17%
Usable Square Meters ¹ :	538,274	681,528	681,264	686,942	676,239
Full-Time Employee Equivalents ² :	14,029	17,584	17,997	18,298	18,332
Weather (Heating Degree Days) ³ :	2,870	2,627	2,490	2,537	2,922

Heating Degree Days (HDD) has a major effect on the carbon emissions due to the increased natural gas consumption from the stationary combustion plant. In 2017, while the overall change of usable area was only 1.6 per cent less than 2016; the HDD increased significantly by 15 per cent compared with 2016. In contrast, Fraser Health's 2017 Carbon Offsets of 40,525 tCO₂e were only nine per cent more than they were in 2016. This has largely been due to the 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	2014	2015	2016	2017
CO₂	Mobile Fuel Combustion:	136	124	106	114	100
	Stationary Fuel Combustion:	35,404	37,736	34,875	35,948	39,324
	Supplies (paper):	1,056	1,010	1,434	1,081	1,123
	Carbon Footprint⁴:	36,596	38,870	36,415	37,143	40,547
	Emissions not requiring Offsets⁵:	- 8	- 12	- 19	- 20	- 22
	Carbon Offsets⁶:	36,587	38,859	36,396	37,124	40,525

¹ Usable area excludes roof tops, interstitial spaces and parking areas.

² Full-Time Employee data is provided by Ministry of Health.

³ The Heating Degree Days are taken from Vancouver Airport using a base temperature of 18°C.

⁴ 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.

⁵ As outlined in the Carbon Neutral Government Regulation of the Greenhouse Gas Reductions Target Act, some emissions do not require offsets.

⁶ 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)

- **Continued our effort to further reduce our environmental impact by initiating 23 retrofit projects** with a total estimated energy savings of 5.1 gigawatt hours (18,240 gigajoule) resulting in greenhouse gas savings of 617 tCO₂e.
- **Fully utilized the Carbon Neutral Capital Program** to fund the energy / greenhouse gas emission reduction project at Burnaby Hospital. More than \$1 million of Carbon Neutral Capital Program funds, combined with internal capital funds and incentives, were invested. Approximately one-third of the above greenhouse gas savings are a result of this project.
- **Invested \$155,347 from the Green Revolving Fund** in electricity energy saving projects.
- **Completed a Fortis Custom Study at Chilliwack General, Eagle Ridge and Ridge Meadows Hospitals** and embarked on three further studies at Fraser Canyon Hospital, Peach Arch Hospital and Queens Park Care Center.
- **Implemented more than 25 optimization energy conservation measures** at Surrey Memorial Hospital as part of the BC Hydro and Fortis BC Continuous Optimization Program.
- **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, identification of reduction opportunities and optimization of existing equipment or plants.
- **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 human and environmental health, performance efficiency, and financial investment.

Mobile Fleet Combustion (Fleet and other vehicles)

- **Installed and activated six electric vehicle charging stations**, making a total of 56 stations available across Fraser Health sites.
- **521 bike parking stalls are available across Fraser Health sites.**
- **Continued the shuttle transport service** for ambulatory patients, family members, and employees between three facilities and the SkyTrain at Surrey Central Station, and between Royal Columbian Hospital and Braid Station. In 2017, the shuttles facilitated the transfers of 98,588 passengers.

Supplies (Paper)

- **In 2017, 13 volunteers joined the Fraser Health Green+Leader program**, making a total of 128 trained Green+Leaders in Fraser Health. As part of the waste reduction campaign, they were supplied with toolkits to reduce paper use through double-sided printing, paperless meetings, and more.
- **Continued to provide inspiration, tips and toolkits to reduce waste, including paper use, on the GreenCare Community website.** Fraser Health currently has 1,400 staff registered for the GreenCare Community.

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

- **Staff participated in the 2017 BC Commuter Challenge**, a campaign that encouraged staff to choose healthier transportation, such as walking, biking, carpooling or taking transit.
- **The Lower Mainland Energy Environment and Sustainability team educated 193 employees on waste management process** and trained seven to become recycling champions.
- **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.
- **Training, resources, toolkits, and recognition were used** to support staff champions through the Green+Leaders program.

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)

- **Planning and implementing greenhouse gas / energy reduction projects** in our existing building portfolio by using the Carbon Neutral Capital Program and supplementing with internal capital funds and incentives from BC Hydro and Fortis BC.
- **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.
- **Engaging with design engineers** and new construction teams to ensure our new buildings adopt energy efficient design principles.

- **Building partnerships with cities and municipalities** to investigate district energy systems opportunities with alternative energy solutions.
- **Engaging and educating Fraser Health employees**, through the Green+Leaders program, GreenCare Community, and BC Hydro Energy Wise program.

Mobile Combustion (Fleet and other vehicles)

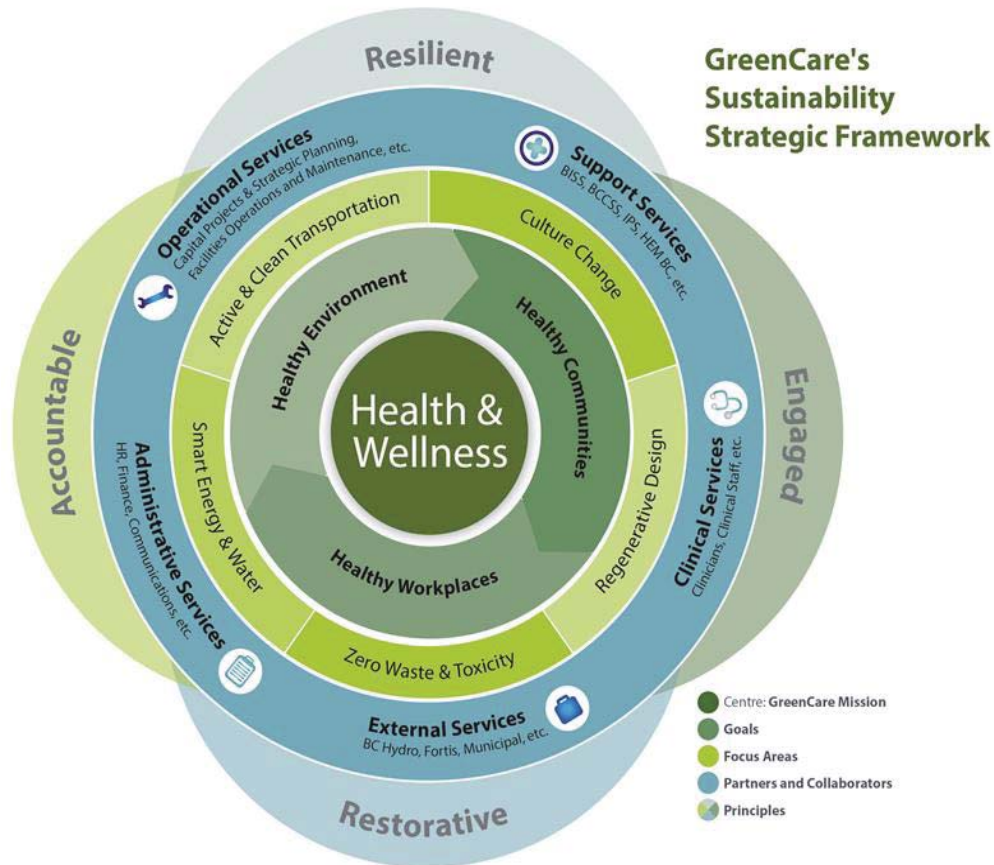
- Continuing to work with Fleet Procurement and Transportation Demand Management Coordinator to improve, promote, and establish low carbon transportation opportunities.

Supplies (Paper)

- Collaborating with BC Clinical and Support Services and paper supplier about procurement of environmental 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.

Strategic Plan

- **Develop a roadmap** for a strategic adaption climate resilience plan.
- **Collaborate with key stakeholders** to refresh the GreenCare Sustainability Strategic Framework to advance health care practices that respect environmental stewardship in recognition that the environmental impact from health care facilities, operations, and services influence the health of the populations and patients we serve. Fraser Health will engage in a collaborative approach to create a sustainable and environmentally responsible healthcare system, which continues to advance health and wellness in its broadest sense.



Crews working on the new mental health building at Royal Columbian Hospital.

Success Stories



What began as the installation of a new boiler and the upgrade of controls evolved into a collective approach to improve energy efficiency at Burnaby Hospital.

In 2017, Fraser Health celebrated the success of these coordinated efforts at Burnaby Hospital. The Energy and Environmental Sustainability (EES) team worked closely with the Facilities Maintenance and Operations (FMO) team to:

- Upgrade the kitchen’s domestic hot water system to a steam heat exchanger system (Fig.1)
- Install a new boiler and control system to reduce the natural gas consumption occurring at low load heating conditions (Fig.2)
- Upgrade the controls on the heating loop and ventilation systems to optimize system efficiency



Fig.1



Fig.2

The total expected reduction is 4,098 gigajoule (GJ) of gas and 319,495 kilowatt hours (kWh) of electricity equivalent to a total carbon reduction of 208 tCO₂e /yr. The installation of these measures was completed in spring 2017. External funding sources included the Carbon Neutral Capital Program and financial incentives from both Fortis BC and BC Hydro.

Collaboration between the EES team and the FMO team was a key success factor throughout the project phases. The measurement and verification process is important in the post project phase. Since implementation, EES and FMO have been meeting in quarterly engagement sessions to discuss the project and overall energy performance.

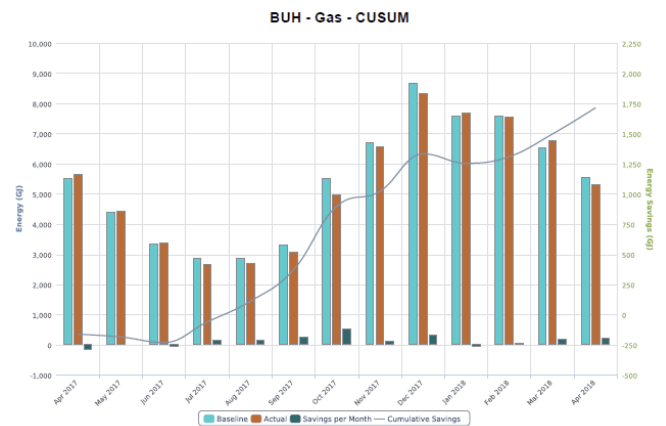


Fig.3

In the summer of 2017, following one of these quarterly engagement sessions, the team noticed that the natural gas savings were not being met as predicted. The team re-engaged the project engineering consultant and boiler manufacturer to review the boiler performance. Fine tuning of the boiler controls was carried out under low load condition and this resulted in an increase monthly natural gas savings, as seen in the chart (Fig.3ⁱ). Besides project performance discussion, new future energy efficiency projects were also discussed in the quarterly sessions. As a result, boilers cascading and heat recovery energy projects are now in place.

The quarterly engagement sessions provide the collaborative team with a unique opportunity to continuously review and optimize plant operation to move Burnaby Hospital further towards optimal energy efficiency.

ⁱ Cumulative Summation (CUSUM) chart of gas saving in gigajoule (GJ) with weather adjusted 2016 as base year.

Part 1: CNAR Survey

1. General Information

Name: Jeson Mak

Contact Email: jeson.mak@fraserhealth.ca

Organization Name: Fraser Health

Sector: Health

2. Stationary Sources (eg. Buildings, Power Generators): Fuel Combustion, Electricity use, Fugitive Emissions.

During 2017, did your organization take any of the following actions to support emissions reductions from buildings? (please select all that apply)

Conducted an energy audit/study of building(s) in the organization's portfolio.; Performed energy retrofits of the organization's building(s); Built, or are building new LEED Gold or other "Green" buildings

If you selected "*Performed energy retrofits of the organization's building(s)*":

How many buildings were retrofitted?: 11

If you selected "*Built, or are building new LEED Gold or other "Green" buildings*":

How many new "Green" buildings?: 2

Did your Organization perform any retrofits during 2017? Please describe briefly:

A total of 23 energy retrofit projects including 1 Continuous optimization project were completed in 11 buildings. An estimated saving of 5.1 gigawatt hours (18,240 gigajoule) of energy, thereby reducing our carbon footprint by 617 tonnes of CO₂

2a. Stationary Sources (eg. Buildings, Power Generators): Fuel Combustion, Electricity use, Fugitive Emissions.

Please briefly describe your organization's plans to continue reducing emissions from its stationary sources:

a) Over the next 1-5 years

Fraser Health has a 3 year Strategic Energy Management Plan (SEMP), complete with details of our Energy & GHG use, reduction targets and planned actions to achieve these targets. Although this is a 3 year rolling plan, the SEMP is reviewed and updated annually. This allows us to compare our energy use & GHG performance across the building portfolio and adjust the planned actions accordingly.

b) Over the following 6-10 years

- Promotion of Energy Conservation via our Policy & Strategic Framework;
- Site specific energy studies and audits will continue to be carried out on inefficient processes and plant;
- Energy conservation measures will be identified and technical projects implemented;
- Existing buildings will continue to be optimized;
- Energy awareness and educational strategies will be implemented;
- Energy efficient solutions will be recommended for new construction and major renovation.

3. Mobile Sources (Vehicles, Off-road/portable Equipment): Fuel Combustion:

During 2017, did your organization take any of the following actions to support emission reductions from its mobile sources? (please select all that apply)

3) Mobile Sources - Other? Please specify: Installed and activated six electric vehicle charging stations, making a total of 56 stations available across Fraser Health sites. 521 bike parking stalls are available across Fraser Health sites. Also, continuing the shuttle transport service for ambulatory patients, family members, and employees.

If you selected "*Replaced existing vehicles with more fuel efficient vehicles (gas/diesel)*":

How many vehicles?:

If you selected "*Replaced existing vehicles with hybrid or electric vehicles*":

How many vehicles?:

3a. Mobile Sources (Vehicles, Off-road/portable Equipment): Fuel Combustion:

Please briefly describe your organization's plans to continue reducing emissions from its mobile sources:

a) Over the next 1-5 years

1. Fleet vehicles will continue to be replaced by more fuel efficient model or disposed of, as and when required.
2. The Surrey staff / patient shuttle service between three Fraser Health facilities and Sky Train station at Surrey City Centre, and the staff shuttle service between Royal Columbian Hospital and Braid Station during site re-development construction will be continued.
4. Seeking for opportunity to add more bike stalls and electrical vehicle charging stations in new buildings plan

b) Over the following 6-10 years

Continuing to work with Fleet Procurement and Transportation Demand Management Coordinator to improve, promote, and establish low carbon transportation opportunities.

4. Supplies (Paper): Indicate which actions your PSO took in 2017:

During 2017, did your organization take any of the following actions to support emissions reductions from paper supplies? (please select all the apply)

4) Supplies (Paper): Indicate which actions your PSO took in 2017: - Other? Please describe briefly: (1) As part of the paper/waste reduction campaign within the Green+Leaders (G+L) behaviour change program, volunteers were supplied with Paperless Meeting Toolkits to encourage their colleagues to reduce paper use. (2) The online GreenCare Community (GCC) site provides tips and toolkits on using less paper, such as promoting paperless meetings.

If you selected "*Had a policy requiring the purchase of recycled content paper*":

State the required recycled content here (30%, 50%, 100%):

If you selected "*Had a policy requiring the purchase of alternate source paper (bamboo, hemp, wheat, etc)*", which type of alternate source paper did you use?

Please briefly describe your organization's plans to continue reducing emissions associated with its office paper use in future years.

Work with BC Clinical and Support Services (BCCSS) to explore the opportunity of procuring paper that has a higher percentage of recycled content.

5. Other Sustainability Actions

a) Business Travel

During 2017, did your organization take any of the following actions to support emissions reductions from business travel? (please select all that apply)

Encouraged alternative travel for business (e.g. bicycles, public transit, walking); Encouraged or allowed teleworking or working from home

5) Other Sustainability Actions - Other? Please specify:: Staff participated in the 2017 Commuter Challenge. Staff at FH continued to utilise the carpool / ride match program.

b) Education/Awareness

During 2017, did your organization have any of the following programs or initiatives to support sustainability education and awareness? (please select all that apply)

A Green, Sustainability or Climate Action Team; Support for professional development on sustainability (e.g. workshops, conferences, training); Supported or provided education to staff about the science of climate change, conservation of water, energy and/or raw materials

5a) Other Sustainability Actions - Other? Please specify:: (1) Continued with the successful Green+Leaders (G+L) behaviour change program, with a focus on fostering sustainable behaviours in four key areas: Zero Waste, Energy Conservation and Climate Neutral, Active & Clean Transportation and Social Sustainability. In 2017, 13 volunteers joined the Fraser Health Green+Leader program, making a total of 128 trained Green+Leaders in Fraser Health. (2) Lower Mainland Facilities Management GreenCare Community (GCC) site is used to communicate all EES projects and initiatives, as well as engage health care staff with the EES themes and offer a place for staff to collaborate. (3) Continued with the sponsored BC Hydro Energy Wise Network. This program supports the G+L program and also provides tools and resources for other awareness initiatives, such as our Facilities Maintenance and Operations (FMO) engagement strategy. (4) The Lower Mainland Energy Environment and Sustainability team educated 193 employees on waste management process and trained seven to become recycling champions.

c) Other Sustainability Actions

During 2017, did your organization have any of the following programs or initiatives to support sustainability? (please select all that apply)

An operations policy or program to facilitate the reduction and diversion of building occupant waste (e.g., composting, collection of plastics, batteries) from landfills or incineration facilities; Lifecycle costing of new construction or renovations