

Provincial Health Services Authority's 2017 Carbon Neutral Action Report



Declaration Statement

This Carbon Neutral Action Report for the period January 1 to December 31, 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.

In 2010 Vancouver Coastal Health, Fraser Health, Providence Health Care and Provincial Health Services Authority consolidated their efforts towards environmental sustainability to create the GreenCare Community. By June 30, 2018 Provincial Health Services Authority's final Carbon Neutral Action Report will be posted to our website at bcgreencare.ca

The cover photo is of the Teck Acute Care Centre on the BC Children's and BC Women's Hospitals campus in Vancouver, BC. This new facility was completed in 2017 and is targeting LEED Gold Certification.

Executive Summary



Executive Summary

Carl Roy, President & Chief Executive Officer

I am pleased to present the eighth annual Carbon Neutral Action Report, which highlights the Provincial Health Services Authority's (PHSA) actions to reduce our carbon footprint, and link environmental sustainability to public health and wellness.

Over the years, we have worked to raise environmental awareness amongst our staff, patients and the communities we serve. These efforts have reduced PHSA's operational impact on the natural environment while reducing operational costs too.

In 2017, PHSA had a carbon footprint of 18,549 tonnes of carbon dioxide equivalent (tCO₂e), which was offset at a total cost of \$486,911. This represents a 23 per cent decrease from the 2007 PHSA carbon footprint. This decrease is even more significant given that we assumed responsibility for added services, programs and staff during this period.

In 2017, PHSA completed six energy conservation projects, with a total estimated savings of 2,919,046 kWh of electricity and 12,379 gigajoules of gas, which equates to a greenhouse gas reduction of 649 tCO₂e. The largest of the completed projects for 2017 was the energy conservation component of the Teck Acute Care Centre at BC Children's and BC Women's Hospitals and Health Centre campus. These efforts also yielded a \$500,000 incentive rebate from BC Hydro, which is being reinvested into an energy conservation project that will further reduce PHSA's operational footprint.

I want to recognize PHSA's energy management team, who work closely with our facilities maintenance and operations teams to reduce emissions, in addition to all of our staff who support these efforts. Thanks to their work, PHSA was recognized in 2017, as one of the Greenest Employers in Canada for a fifth consecutive year. This ultimately adds to the health and wellness of our patients, employees and the communities we serve.



Date: May 31, 2018

Carl Roy
President & Chief Executive Officer
Provincial Health Services Authority

Our CO₂ Footprint

2017 GREENHOUSE GAS EMISSIONS BREAKDOWN AND OFFSETS APPLIED TO BECOME CARBON NEUTRAL

PHSA reports its organizational carbon footprint based on guidelines provided by the Carbon Neutral Government Regulation (CNGR) and the Climate Action Secretariat (CAS).

Climate Action Secretariat developed reporting guidance based on the GHG Protocol Corporate Standard. Based on these guidelines, Providence Health Care's carbon footprint is comprised of six different greenhouse gases, which are converted into a common metric of tonnes of carbon dioxide equivalent (tCO₂e). In scope carbon emissions are categorized in three main categories:

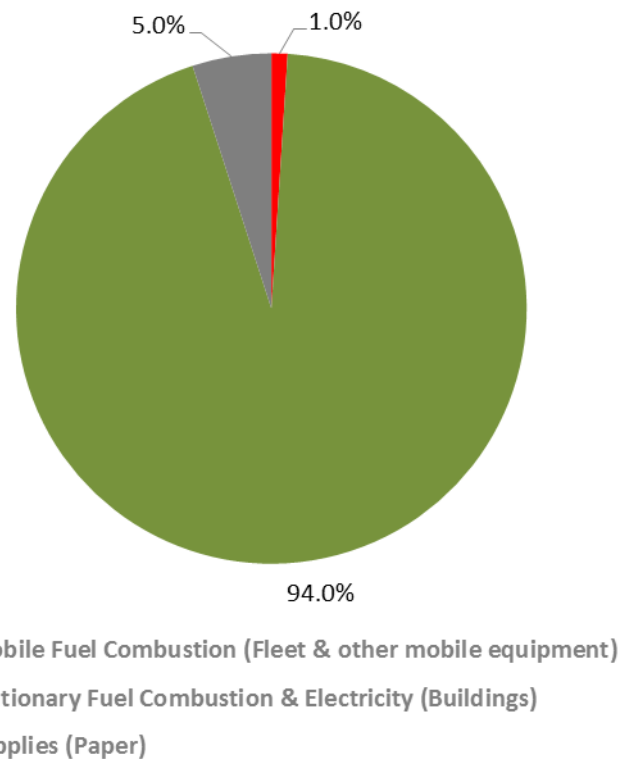
1. Stationary Fuel Combustion
2. Mobile Fleet Combustion
3. Supplies (Paper)

PHSA's 2017 carbon footprint offset was 18,549 tonnes of carbon dioxide equivalent (tCO₂e). That represents a 23 per cent decrease in PHSA's carbon footprint since 2007.

Over 90 per cent of PHSA's in-scope emissions are attributed to the building portfolio, and over 90 per cent of those emissions are associated with natural gas consumption. CAS administers the Carbon Neutral Capital Program (CNCP), through which PHSA has access to capital funding that is used to implement capital projects to reduce GHG emissions. These projects are focused on natural gas reduction in buildings.

To become carbon neutral in 2017, PHSA purchased carbon offsets at a total cost of \$486,911.

2017 PHSA Emission by Source



CHANGES TO PROVINCIAL HEALTH SERVICES AUTHORITY'S PORTFOLIO

PHSA's useable facility space has increased 7.6 per cent since 2007, which is largely due to the construction of the Teck Acute Care Centre. During the same period, the number of staff (measured in full time equivalents) has increased by 43 per cent. PHSA has controlled increases in facility space to accommodate increased staff by seeking opportunities to optimize existing space use while maintaining safety and efficiency.

Provincial Health Services Authority								
BUILDINGS, FTE AND WEATHER		2007	2012	2013	2014	2015	2016	2017
Distinct PHSA Buildings		n/a	69	68	74	73	76	74
	% Owned	n/a	57%	69%	69%	69%	68%	73%
	% Leased	n/a	43%	31%	31%	31%	32%	27%
Usable Square Meters¹		388,990	400,444	355,437	358,082	358,455	358,995	418,631
Full-Time Employee Equivalents²		6,391	6,511	7,812	8,122	8,455	8,814	9,138
Weather (summarized in Heating Degree Days)³		2,870	2,859	2,820	2,627	2,489	2,537	2,922

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

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

³ Heating Degree Days (HDD's) are based on YVR Airport data from Environment Canada and are intended to reflect the demand for heating. Although PHSA's facilities are located across BC, the majority of buildings in the metro Vancouver area, so HDD's for Vancouver were used.

As of 2017, emissions per full-time equivalent (2.03 tCO₂e/FTE) have decreased by 46 per cent since 2007, and emissions per unit of floor area (0.04 tCO₂e/m²) have decreased 28 per cent since 2007. The carbon emissions reported are not adjusted for changes in weather. Heating Degree Days (HDDs) is a metric that reflects the demand for energy required to heat a building. The HDDs for 2017 were 2 per cent higher than those recorded in 2007, while emissions have decreased. This is reflected by the lower emissions per HDD, partially due to increased efficiency of the heating systems overall.

Provincial Health Service Authority ²								
Our Carbon Footprint (in tCO ₂ e)		2007	2012	2013	2014	2015	2016	2017
Mobile Fuel Combustion (Fleet & other mobile equipment)		189	203	153	159	159	417	189
Stationary Fuel Combustion & Electricity (Buildings)		22,930	24,953	19,893	17,933	16,426	17,027	17,442
Supplies (Paper)		891	839	771	828	882	893	927
Total Carbon Footprint (tCO₂e)		24,010	25,995	20,818	18,921	17,468	18,338	18,558
Emissions Which Do Not Require Offsets ¹		-9	-10	-10	-9	-10	-16	-9
Total Carbon Footprint (tCO₂e)		24,002	25,984	20,808	18,912	17,458	18,322	18,549
Total Carbon Footprint - for offsetting (tCO₂e)		24,002	25,984	20,808	18,912	17,458	18,322	18,549

\$	Purchased Carbon Offsets	\$ -	\$ 644,750	\$ 538,025	\$ 472,625	\$ 436,700	\$ 458,050	\$ 463,725
	Purchased Carbon Offsets +HST / GST³	\$ -	\$ 676,988	\$ 564,926	\$ 496,256	\$ 458,535	\$ 480,953	\$ 486,911

KPI	Emissions per Full-Time Employee (tCO ₂ e/FTE)	3.76	3.99	2.66	2.42	2.06	2.08	2.03
	Emissions per Facility Space (tCO ₂ e/m ²)	0.06	0.06	0.06	0.05	0.05	0.05	0.04
	Emissions per Heating Degree Day (tCO ₂ e/HDD)	8.4	9.1	7.4	7.2	7.0	7.2	6.3

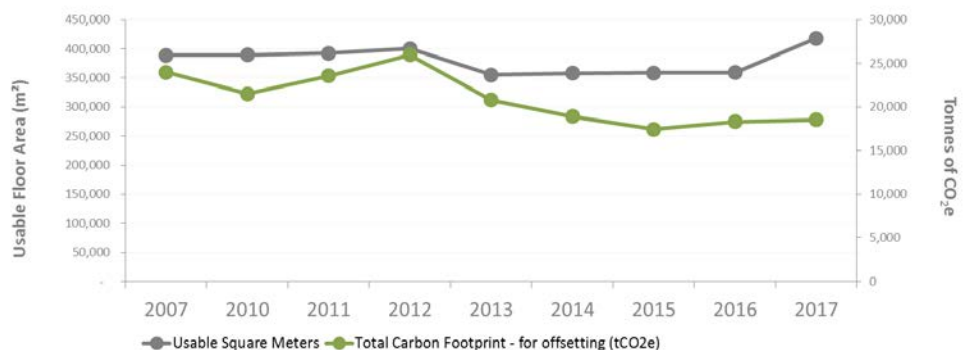
¹ As outlined in the Carbon Neutral Government Regulation of the Greenhouse Gas Reductions Target Act, emissions do not require offsets.

² Total emissions from previous years are subject to minor adjustments / corrections following annual reviews.

³ Total invoice amount paid for 2017 was \$487,567.50 which includes a 25 tCO₂e adjustment to prior years.

Since 2007, PHSA's usable floor area has increased while emissions have decreased.

PHSA Useable Floor Area and Emissions (2007-2017)



Actions Taken To Reduce Our CO₂ Footprint

2017 LIST OF ACTIONS TAKEN TO REDUCE CO₂ FOOTPRINT

Stationary Emissions (Buildings)

In 2017, PHSA completed six projects, with a total estimated savings of 2,919,046 kWh of electricity and 12,379 GJ of gas, which equates to GHG reduction of 649 tonnes of carbon (tCO₂e). These projects included the following:

- **Teck Acute Care Centre new construction:** An energy efficient design for the new Teck Acute Care Centre building at the BC Children's and BC Women's campus (C&W campus). Construction was completed in 2017 and the building is now in full operation.
- **Fraser Valley Cancer Centre Optimization:** An optimization project at the BC Cancer's Fraser Valley Centre consisting mainly of controls optimization measures.
- **Genset HP Block Heaters:** Heat pump block heaters were installed at both BC Cancer's Vancouver Centre and BC Cancer Research Centre. This reduces the annual electricity costs required to keep the back-up generators at the temperature required for a reliable start.
- **BC Cancer's Vancouver Centre Parkade Lighting Upgrade:** LED lighting was installed in the BC Cancer's Vancouver Centre parkade to improve visibility, safety and reduce electricity costs.
- **BC Cancer Research Centre Retro-Commissioning:** After completing a major heat recovery chiller project at the BC Cancer Research Centre, a project to recommission and optimize the building's systems was undertaken and completed. In addition to improving building performance, this exercise has opened the door to the possibility of further projects and potential savings measures in future.

In addition, four other energy savings projects were in progress at PHSA during 2017, with estimated savings once complete of 329,462 kWh of electricity, and 6,018 GJ of gas, which equates to GHG reduction of 304 tCO₂e. These projects include the following:

- **Genset HP Block Heaters:** Heat pump block heaters are in the process of being installed on the five largest generator sets on BC Children's and BC Women's campus to further reduce electricity operating costs.
- **Heat Recovery:** A CNCP-funded heat recovery project at C&W campus.
- **BC Cancer's Vancouver Centre Optimization:** An optimization project at the BC Cancer's Vancouver Centre consisting mainly of controls optimization measures.

Other initiatives taken to reduce emissions from buildings:

- PHSA's energy management team made further refinements to GreenCare's **Energy and Environmental Sustainability Design Guidelines** for new construction and major renovation projects intended to ensure that new buildings are built to the highest standard of energy efficiency within financial constraints.
- The energy management team continued with an **engagement strategy** with facilities maintenance and operations, focused initially at C&W campus, with plans to expand to all major owned sites over time. The focus is to identify reduction opportunities.

Mobile Fleet Combustion (fleet and other vehicles)

In 2017, PHSA's transportation demand management coordinator worked to improve, promote and establish alternative transportation opportunities for PHSA staff.

- PHSA has **sixteen** (15-120v; 1-240v) **electric vehicle-charging stations** across two core sites.
- PHSA partners with Vancouver Coastal Health and Providence Health Care to provide a **shuttle service** between sites.
- PHSA continues to operate a staff shuttle between BC Children's and BC Women's Hospitals campus, staff off-site parking lot and King Edward Station that transported **116,122 passengers** in 2017.
- PHSA has **753 bike parking stalls**, with 14 new stalls added in the 2017 calendar year.
- PHSA **encourages teleconferencing** for meetings using web-conferencing hardware and software available at various sites.

Supplies (Paper)

Initiatives to reduce paper consumption include:

- As part of the Green+Leader program, a **paper/waste reduction campaign** supports volunteers with **Paperless Meeting Toolkits** to encourage their colleagues to reduce paper use.

Actions that fall outside the scope of the Carbon Neutral Government

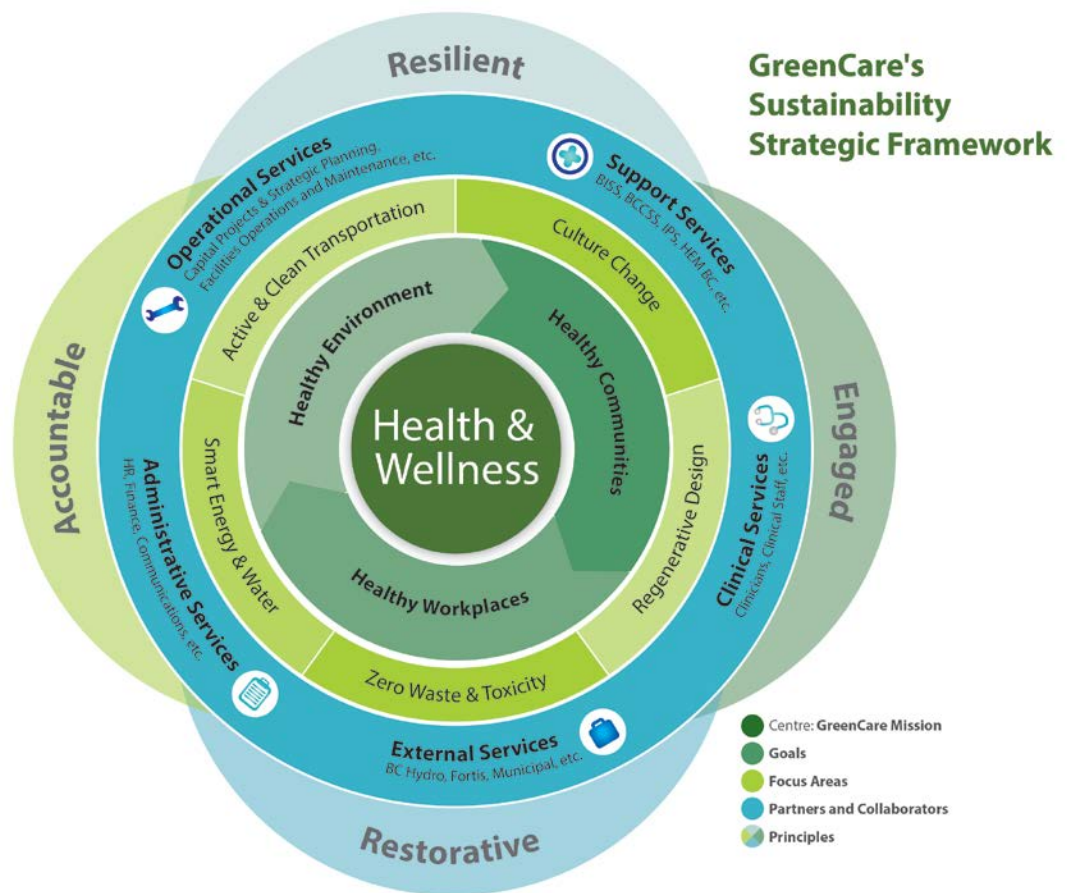
Regulations:

- PHSA provided **training, resources, toolkits and recognition** to support the Green+Leader program and various green teams in PHSA.
- The **Green+Leaders** behaviour change program recruited **eight new volunteers** for PHSA in 2017, making a total of **43 active staff volunteers** across PHSA, and a total of 147 PHSA staff trained since the program began in 2007¹.
- PHSA has at least four active "**green committees**" or green teams, which are led by Green+Leaders at those sites; these committees explore and implement a broader variety of sustainability initiatives going beyond the Green+Leaders toolkits
- PHSA continues to support the **GreenCare Community** website, which provides tips and toolkits on using less paper, as well as other environmental sustainability initiatives linked to health and wellness. PHSA had **1,071 staff registered** on the site as of 2017
- **Education and awareness** communication via the GreenCare Community is supplemented by stories published in PHSA news and various internal communication channels; these efforts continue to champion behaviour change and celebrate environmental sustainability successes.
- PHSA supports professional development through workshops and educational sessions sponsored by **BC Hydro** and **Fortis BC**

¹ Note these corrections to the 2016 data reported: In 2016 there were 42 total active PHSA staff volunteers and 139 staff trained since the program began in 2007.

PHSA's plans to continue reducing GHG emissions and energy in the following ways:

- Optimize our existing buildings:** Planning and implementing GHG and energy reduction projects in our existing building portfolio by utilizing the Carbon Neutral Capital Program (CNCP) as our primary funding source.
- Efficient new construction:** Implementing project-specific energy and carbon performance targets to ensure that our new buildings are as energy and carbon efficient as possible.
- Systemic change:** Implementing standards, guidelines, and processes to embed energy management principles further into standard operations.
- Behaviour change:** Engaging and educating our staff, via the existing Green+Leaders program, GreenCare Community and the BC Hydro and FortisBC engagement programs.
- Innovation and demonstration:** Leveraging the innovative Green Revolving Fund approach that has been initiated for PHSA to support ongoing investment in energy conservation through utility cost avoidance achieved through conservation. In addition, taking small steps now (such as learning about new technologies) to pave the way for larger innovations when an appropriate opportunity arises.
- Align with our core mandate:** Working with GreenCare's refreshed Strategic Framework; PHSA will strive to advance health care practices that respect environmental stewardship, noting that the environmental impact from health care facilities, operations and services influence the health of populations and patients we serve. PHSA will engage in a collaborative approach to create a sustainable and environmentally responsible health care system, which continues to advance health and wellness in its broadest sense.



Feature Project

Early involvement pays off

The Teck Acute Care Centre at the BC Children's and Women's Hospitals campus opened its doors to patients in October of 2017. A vast array of stakeholders as well as design and construction professionals played a role in achieving this outcome. This story is just one small example of efforts made to improve the performance of this major healthcare infrastructure investment.

PHSA's current Energy Manager, Alex Hutton, joined Lower Mainland Facilities Management in 2012, which was just in time to bring her background in sustainable building design and energy modeling to support the building project. Knowing that the opportunity to influence a project decreases over time and the cost effectiveness of design changes also diminish over time, she took steps to immediately to ensure that energy efficiency was being considered.

At this stage, PHSA had already done a great deal of work including hiring their indicative design team to support the Public Private Partnership (P3) delivery model. The team had already developed a conceptual design with associated specifications and was nearly ready to issue these for P3 proponents to bid upon.

There was just enough time to engage an energy modeling specialist to lead an integrated design charrette in order to collaboratively develop a realistic energy target intended to push the P3 teams to innovate and produce a more energy efficient design. This exercise informed the upper limit energy target that was imposed. More clear and rigorous requirements were also placed upon the P3 proponents to ensure that they could be evaluated on an apples-to-apples basis.

The winning P3 team confirmed that the energy target had indeed caused them to innovate. They put increased effort into finding creative ways to maximize recovery of waste heat (such as heat rejected to deliver cooling).

In 2017, PHSA received an incentive rebate for \$500,000 from BC Hydro after confirmation that the energy conservation measures planned had been implemented. PHSA's energy management team continue to be involved in the project through the ongoing measurement and verification of actual energy consumption relative what was predicted during design.

Project: ~58,000 m² new build

Technology: Various strategies were employed, the most impactful of which involved an innovative approach to heat recovery.

Energy Savings: An estimated 2 GWh/year electrical and 12,000 GJ per annum of natural gas (due to reduced steam consumption)

Operational Cost Avoidance: \$230,000 (estimated energy cost savings relative to code baseline)

GHG Reductions: An estimated 600 tCO₂e/year

Energy Project Cost: Incremental* cost of energy conservation features: \$1.5 million

Business Case: Seven year simple payback based on reduced operational costs alone.

Benefits/Co-Benefits: \$500,000 incentive from BC Hydro and \$35,000 pending from FortisBC; Cost effective carbon reduction: \$2,500 per tonne GHG reduction

*Incremental Project Cost refers to the additional cost required to install energy efficient equipment above the cost for the building code minimum standard (in this case, above the cost of a building that meets the building code requirements).

Part 1: CNAR Survey

1. General Information

Name: Alex Hutton

Contact Email: Alex.Hutton@fraserhealth.ca

Organization Name: Provincial Health Services Authority

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

2. Stationary Sources - Other? Please specify: (1) Continued with Implementation phase of the BC Hydro Continuous Optimization (C.Op.) program at 2 sites and started the Investigation phase at 1 new site. (2) Continued to roll out Energy Engagement Strategy with FMO staff. (3) Promoted the use of our Energy and Environmental Sustainability (EES) Design Guidelines for New Construction and Major Renovation projects. (4) Continued to promote energy conservation and GHG emissions reduction through awareness and behaviour change programs.

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

How many buildings were retrofitted?: 5

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

How many new "Green" buildings?: 1

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

- BC Cancer Research Centre - Completed building retro-commissioning following a major heat recovery project spanning multiple prior years (achieving gas and electricity savings)
- Fraser Valley Cancer Centre - Implementation of BCHydro's Continuous Optimization program was completed achieving both gas and electricity savings
- TACC NC Project - Major construction project of the Teck Acute Care Centre on children's and women's campus.
- Air Sealing measures implemented at VCC and CWHC

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

Provincial Health Services Authority is developing 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 SEMF is reviewed and updated annually. Our work can be summarized within five main areas: optimizing our existing buildings; influencing new construction; behaviour change; systemic change; and innovation.

b) Over the following 6-10 years

Our longer term strategy is currently to continue with the types of efforts described in the short term; however, we can anticipate that there may be changes in the priorities (such as increased focus on electrification) as well as the specific projects that result. We can also anticipate the specific projects may involve new and innovative technologies and strategies not currently available or ready for implementation.

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)

None of the above

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 to be replaced by more fuel efficient model or disposed of, as and when required.
2. Established and successful staff / patient shuttle routes will be continued for the foreseeable future.

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. A funding application has been submitted that may result in additional EV charging stations being installed, which could potentially trigger a move towards EV fleet vehicles.

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)

Had an awareness campaign focused on reducing office paper use

4) Supplies (Paper): Indicate which actions your PSO took in 2017: - Other? Please describe briefly:: 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. There are now 47 active G+Ls within PHSA.

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.

In collaboration with BC Clinical and Support Services (BCCSS), Provincial Health Services has continued to discuss the procurement changes to improve 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)

5) Other Sustainability Actions - Other? Please specify:: Staff participated in the 2017 Commuter Challenge. Staff at PHSA have continued to utilize 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

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

5b) Other Sustainability Actions - Other? Please specify:: Continued with the successful Green+Leaders (G+L) behaviour change program, with a focus on fostering sustainable behaviors in four key areas: Zero Waste, Energy Conservation and Climate Neutral, Active & Clean Transportation and Social Sustainability. In 2017, 8 volunteers joined the Green+Leader program, making a total of 92 trained Green+Leaders.

- 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.

- 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.

- The Lower Mainland Energy Environment and Sustainability team educated 193 employees on waste management process and trained seven to become recycling champions.