

Vancouver Coastal 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 net-zero 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.

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, 2019 Vancouver Coastal Health's final Carbon Neutral Action Report will be posted to the GreenCare Community website at bcgreencare.ca

Retirement of Offsets

In accordance with the requirements of the Greenhouse Gas Reduction Targets Act and Carbon Neutral Government Regulation, Vancouver Coastal 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.

The cover photo is of the interior of the Joseph and Rosalie Segal Family Health Centre, located on the Vancouver General Hospital campus.

Executive Summary

Vancouver Coastal Health Carbon Neutral Action Report 2018

Mary Ackenhusen, President and Chief Executive Officer



I am pleased to present Vancouver Coastal Health's (VCH) 2018 Carbon Neutral Action Report.

As part of the provincial public sector commitment to achieve net-zero emissions, Vancouver Coastal Health has achieved carbon neutrality for the eighth consecutive year.

In 2018, VCH's emissions footprint was 40,775 tCO₂e (tonnes of carbon dioxide equivalents) which equates to an 18.6 percent decrease since 2007.

In an effort to continue to pursue an effective response to climate change and limit our emissions, nine energy and emission saving projects and eight energy related studies were initiated this past year. These projects are projected to reduce electricity consumption by over 680,000 kilowatt hours and natural gas consumption by over 10,000 gigajoules. This will directly reduce our carbon footprint by 500 tCO₂e per year.

VCH purchased carbon offsets from the Ministry of Environment at a total cost of \$1,069,189 to maintain carbon neutral status.

I am proud to state that I, along with over 1,767 other Vancouver Coastal Health staff, have joined our internal GreenCare Community in pursuit of reducing our operational energy and environmental impact. Reducing our impact will ultimately add to the health of our clients, staff, facilities, and benefit the wellbeing of the extended communities we serve.

As 2019 progresses, I will continue to support our innovative and collaborative approach towards reducing VCH's environmental and carbon footprint which drives our commitment to create sustainable health care.

A handwritten signature in blue ink, appearing to read 'Mary Ackenhusen', written in a cursive style.

Mary Ackenhusen, President and Chief Executive Officer



Our CO₂ Footprint

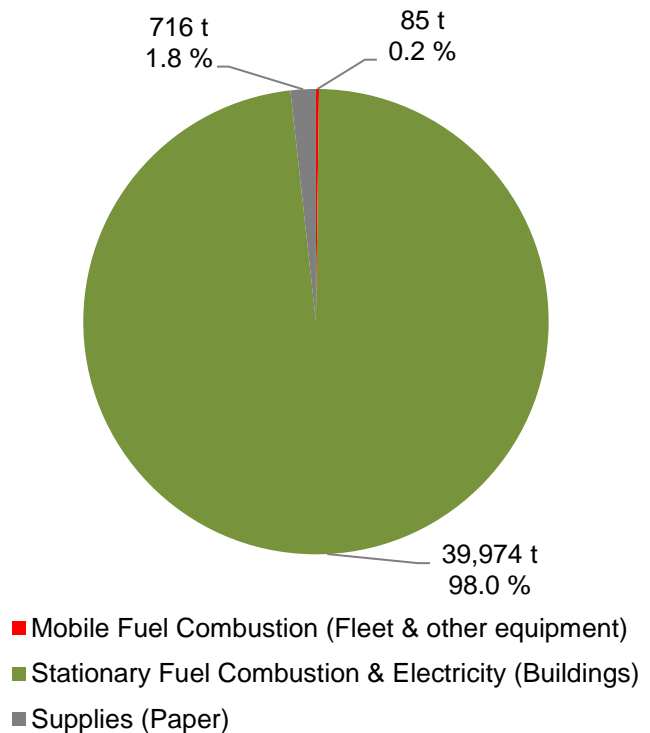
2018 GREENHOUSE GAS EMISSIONS BREAKDOWN

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

CAS uses various elements of reporting, based on the GHG Protocol Corporate Standard, which has classified carbon reporting into three scopes. Of these three scopes and various elements within each, CAS has determined Vancouver Coastal Health's carbon footprint to comprise of six different greenhouse gases, which are converted to tonnes of carbon dioxide equivalent (tCO₂e). These main sources of emissions are categorized in three main groupings: Stationary Combustion and Purchased Energy (buildings), Mobile Combustion (Fleet), and Supply (Paper).

As shown in the chart on the right, 98 percent of Vancouver Coastal Health's in-scope emissions are attributed to the owned and leased buildings stationary combustion, and purchased energy; the largest area to focus our mitigation efforts.

2018 VCH Emission by Source



Vancouver Coastal Health's 2018 carbon emissions were 40,775 tCO₂e. To become carbon neutral in 2018, Vancouver Coastal Health purchased carbon offsets from the Ministry of Environment at a total cost \$1,069,189.

“The environmental impact from healthcare facilities, operations, and services affects the health of the populations and patients they are meant to serve.”

- Adapted from World Health Organisation & Healthcare without Harm

CHANGES TO VANCOUVER COASTAL HEALTH'S PORTFOLIO

Vancouver Coastal Health has been able to maintain significant energy and GHG reductions while increasing our portfolio and expanding our services to serve our growing regional population. This success 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 the new buildings.

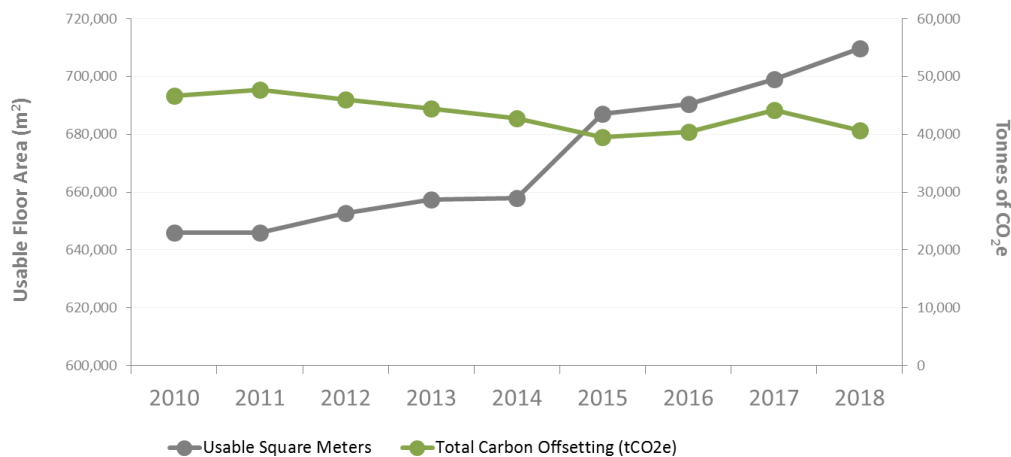
Vancouver Coastal Health had a staff population of 15,121 full-time equivalent (FTE) staff in 2018, a 2.1 percent increase from the previous year as shown in the table below. The FTE count has been growing steadily over the last decade and compared to 2007 there has been an FTE increase of 18.7 percent.

Vancouver Coastal Health Portfolio Overview

BUILDINGS, FTE AND WEATHER	2007	2015	2016	2017	2018
Distinct VCH Health Buildings	n/a	165	165	171	184
% Owned	84%	88%	88%	88%	88%
% Leased	16%	12%	12%	12%	12%
Usable Square Meters ¹	602,766	687,180	690,374	698,979	709,753
Full-Time Employee Equivalents ²	12,738	14,355	14,568	14,810	15,121
Weather (Heating Degree Days) ³	2,870	2,490	2,537	2,922	2,768

Vancouver Coastal Health has increased its useable facility area since 2007 by 17.7 percent; a growth of 9.9 percent has occurred since 2010. This trend, as shown in the graph below, demonstrates the challenge of reducing absolute emissions while the portfolio is growing and expanding to meet the regional clinical needs.

Useable Floor Area and Emissions (2010-2018)



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

² Full-Time Employee data was provided by the Ministry of Health and includes all designated groups reported in HSCIS (i.e., Physicians (doctors on staff), Executive/Excluded, Non-Union, and Bargaining Unit Employees (Community, Facilities, Health Science Professionals, Nurses, Residents)).

³ Building energy consumption is influenced by climate conditions. Vancouver has a climate which predominantly requires heating to satisfy internal building temperatures. Heating Degree Days (HDDs) is a measurement designed to reflect the demand for energy needed to heat a building.

Natural gas is the predominant fossil fuel used for space heating, hot water and process loads. The carbon emissions associated with our natural gas use is approximately 93.5 percent of the total building emissions. Although our priority actions are focused on our natural gas combustion plant, there are many drivers to continue reducing purchased energy and other emission sources.

There has been an 18.6 percent decrease in the carbon footprint since 2007, as shown in the table below. It should be noted that with absolute emissions there is no consideration to weather impacts or other external drivers that impact emissions. Depending on these independent variables, the year-over-year change in emissions may not fully reflect the mitigation efforts, emission avoidance projects and initiatives across the portfolio.

Vancouver Coastal Health Emission Overview					
Our Carbon Footprint (tCO ₂ e)	2007	2015	2016	2017	2018
Mobile Fuel Combustion (Fleet)	104	48	42	42	85
Stationary Fuel Combustion & Electricity (Buildings)	48,536	38,619	39,666	43,356	39,974
Supplies (Paper)	1,402	824	782	762	716
Total Carbon Footprint	50,042	39,491	40,489	44,160	40,775
Total BioCO₂ Emissions (No Offsets Required)^{4,5}	-19	-21	-24	-19	-44
Total Carbon Offsetting (tCO₂e)	50,023	39,470	40,465	44,141	40,731
Purchased Carbon Offsets ⁶	-	\$ 939,275	\$ 1,012,050	\$ 1,102,750	\$ 1,018,275
Purchased Carbon Offsets + HST/GST ⁷	-	\$ 986,239	\$ 1,062,653	\$ 1,157,888	\$ 1,069,189
Emissions per Full-Time Employee	3.93	2.75	2.78	2.98	2.69
Emissions per Meter Square Facility Space	0.083	0.057	0.059	0.063	0.057

The carbon emissions reported are not normalized for annual weather fluctuations. The use of Heating Degree Days (HDD) is a metric designed to reflect the demand for energy required to heat a building. The HDDs for 2018 were five percent lower than those recorded in 2017, therefore, natural gas and resultant emissions were in part influenced due to HDD. Heating Degree Days are the number of degrees that a day's average temperature is below the baseline temperature set by the organization.

For example, using 15° as a baseline temperature. If one day's temperature was 12°, this would equate to three heating degree days since it is 3° below the baseline temperature. That number is then summed up in a period and for the CNAR, it looks at all of the HDDs from January 1, 2018 to December 31, 2018.

⁴ It was estimated that Fugitive Emissions from cooling equipment do not comprise more than 0.01% of VCH's total emissions and an ongoing effort to collect or estimate emissions from this source would be disproportionately onerous. For this reason, emissions from this source 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 Purchased Carbon Offsets represent the actual invoice amount to purchase offsets in the specific calendar year.

⁷ The tax included in the Purchased Carbon Offsets in 2010-2011 included 7% HST and 5% GST, from 2012 onwards only 5% GST is included.

Actions Taken To Reduce Our CO₂ Footprint

2018 ACTIONS TAKEN TO REDUCE CO₂ FOOTPRINT

Stationary Emissions (Buildings)

In 2018, Vancouver Coastal Health completed nine projects which are estimated to reduce electricity consumption by 680,000 kilowatt hours and natural gas by 10,000 gigajoules; resulting in a carbon footprint reduction of over 500 tCO₂e and significant operation savings. To support our long term emission reduction and prioritize our efforts eight energy studies, lighting audits, and site assessments were completed this year.

In collaboration with VCH Finance and the LMFM Project and Planning team the 2018 Carbon Neutral Capital Program project was a high efficiency chiller plant and cooling tower upgrade at UBC Hospital. This project will reduce the natural gas by over 4,373 gigajoules and mitigate 217 tCO₂e.

Vancouver Coastal Health continues to embed sustainability across the organization by supporting staff engagement initiatives such as the GreenCare Community site and provides tips and toolkits on energy reduction and other environmental initiatives. The Green+Leaders (G+L) program continues to train Vancouver Coastal Health staff as sustainability champions, along with the BC Hydro Energy Wise Network Program. Other awareness initiatives, such as our Facilities Maintenance and Operations Engagement Strategy, are in development.

Mobile Fleet Combustion (Fleet and other vehicles)

In 2018, Vancouver Coastal Health's Transportation Demand Management Coordinator and Active Transportation Facilitator worked to improve, promote and establish alternative transportation opportunities for Vancouver Coastal Health staff.

Supplies (Paper)

In collaboration with BC Clinical and Support Services, Vancouver Coastal Health has continued to discuss the procurement of wheat based paper supplies and will explore a proposal to convert the bulk of paper purchased to 30% recycled content. There is an ongoing effort across the organization to assess how to minimize our paper purchases and develop a culture around how we use paper in our day to day work flow.

ONGOING ACTIONS TO REDUCE CO₂ FOOTPRINT

Vancouver Coastal Health will continue to act as leaders in environmental stewardship and emission mitigation in the following ways:

- Planning and implementing energy and emission reduction projects in our building portfolio by utilizing the Carbon Neutral Capital Program funds, internal capital funds, and utility incentive programs;
- Engaging with design engineers to ensure our new builds adopt energy efficient design principles;
- Continue to explore low emission energy supply options, opportunities for demand reduction, and leading technology applications;
- Engaging and educating our staff, via the G+L program, GreenCare Community and BC Hydro EWN

Feature Emission Reduction Project

VGH Energy Centre Steam Plant Optimization

The Lower Mainland Facilities Management Energy and Environmental Sustainability (EES) team, in partnership with the Vancouver General Hospital (VGH) Facilities Maintenance and Operation (FMO) team initiated a project to complete an energy and emission reduction project at the VGH Energy Centre.

The VGH Energy Centre is a large steam plant that provides domestic hot water, heating water, and process steam to a large portion of the campus through a series of infrastructure. The natural gas combustion to generate this steam, serving the sites operational and clinical requirements, including the steam distribution losses, is the largest source of direct emissions in the Vancouver Coastal Health portfolio.

Improving the efficiency of the VGH Energy Centre is an ongoing effort to optimize efficiency and the FMO team are very proactive in maintaining this plant; they have an intimate working knowledge of this complex system.

A FMO power engineer supporting VGH, with support from the VGH Energy Centre leadership, brought forward a unique concept that could potentially improve both the system efficiency and operation.

This idea was presented to the EES VCH Energy Management team and a mechanical engineering consultant was engaged to complete an investment grade energy study, via the Fortis BC Commercial Custom Design Program.

“Developing partnerships with our FMO and project teams is integral to the success of our program,” says Vancouver Coastal Health’s energy manager, Kori Jones. “On sites with established relationships and open communication, we have a better understanding of facility needs, and greater opportunities to identify and implement projects that enhance operations while minimizing environment and health impacts.”



Photo of the new feed water pump, enabling a reduction of 241,000 kWh's of electrical savings each year.

The proposed pump and piping redesign were developed and validated through the study and design process, the FMO team actively participating at each stage of the project. The end result showed significant natural gas and electricity savings and captured an incentive from Fortis BC.

The final project moved ahead and includes the following energy and emission savings measures:

- Piping of a standby boiler preheating system: treated hot water from boilers that would have otherwise gone down the drain was instead injected into the standby boiler to keep the boilers warm;
- Improved staging of the existing three boilers based on actual demand: control sequencing and programming was implemented to determine boiler efficiency and demand needs;
- Addition of a new low load steam feed water pump: a new pump was installed to support the plant during the shoulder heating seasons when lower flows are required.

By implementing these measures, it is estimated that this project will save 241,000 kilowatt hours and 5,600 gigajoules annually, alongside reducing carbon emissions by 280 tCO₂e per year.

The co-benefits of this project include reduced water consumption, improved recovery time of the boiler, and a significant reduction on emission related health impacts and contributions to climate change. An ongoing monitoring and verification is in process to validate the level of energy savings.

This project is a great example of an organization integrated team approach with significant benefits to the Vancouver Coastal Health and the populations served. There has been ongoing collaboration with the FMO and EES team and a second energy study has been initiated at the VGH Energy Centre.

Part 1: CNAR Survey

1. General Information

Name: Kori

Contact Email: Jones

Organization Name: Vancouver Coastal Health

Sector: Health

Role - Please select your role(s) below.

If more than one individual completed the survey, multiple categories may be selected:

Energy Manager: Yes

Sustainability Coordinator: No

Administrative Assistant: No

Facilities/Operations Manager/Coordinator: No

CEO/President/Exec Director: No

Treasurer/Accounting: No

Superintendent: No

A. Stationary Sources (e.g. Buildings, Power Generators): Fuel Combustion, Electricity use, Fugitive Emissions.

1. Actions taken by your organization in 2018 to support emissions reductions from buildings.

a) Do you have a strategy to reduce emissions from stationary sources?

Yes

If yes above, what are the main goals?: Short Term Targets: To reduce electrical energy consumption by 1 gigawatt hours and natural gas energy consumption by 7,000 gigajoules this fiscal year.

Mid Term Targets: To reduce the portfolio energy use intensity (EUI) by 15 percent by 2020 compared to the 2007 baseline. To reduce absolute GHG emissions by 25 percent by 2020 compared to the 2007 baseline.

Long Term Targets: To reduce the portfolio energy use intensity (EUI) by 25 percent by 2030 compared to the 2007 baseline. To reduce absolute GHG emissions by 40 percent by 2030 compared to the 2007 baseline.

Strategic Energy Management Plan

<https://bcgreencare.ca/2018-19-vancouver-coastal-health-strategic-energy-management-plan-semb>

Target Dashboard

https://bcgreencare.ca/sites/default/files/GreenCare_Dashboard_Sept21.pdf

b) Whether you have a strategy or not (1.a), briefly describe your organization's plans to continue reducing emissions from stationary sources:

I. Over the medium-term term (1-5 years)

Continual efforts to develop energy studies, identify energy and emission savings, explore new technologies, capture incentives, fund incremental cost of high efficiency and low carbon systems when possible. The full details are listed in the VCH Strategic Energy Management Plan.

Strategic Energy Management Plan

<https://bcgreencare.ca/2018-19-vancouver-coastal-health-strategic-energy-management-plan-semp>

II. Over the long term (6-10 years)

All major renovations and new construction are being asked to meet carbon and energy targets to drive low carbon buildings. The full details are listed in the VCH Strategic Energy Management Plan.

Strategic Energy Management Plan

<https://bcgreencare.ca/2018-19-vancouver-coastal-health-strategic-energy-management-plan-semp>

c) Please describe your strategy's goals (if any) related to [energy audits](#).

There is a continuous flow of energy audits and studies moving ahead each fiscal year, in 2018 eight energy studies were initiated or completed. This studies are then aligned with

Developing better relationships with the capital project teams is occurring to ensure we can influence outcomes and or at a minimum inform teams of the environmental impacts of the decisions.

I. What % on average of your building portfolio has an energy audit completed each year (if any)? : 5

d) Please describe your strategy's goals (if any) related to building retrofits.

There are no specific building retrofit goal as this depends on the capital project timelines, our ability to influence or support, the outcome and business case development from our energy studies, and the ability to achieve external funding; all of which have variables out of our control.

Building a program on a mix of fiscal expiring operation and capital funds we not always able to plan in advance.

Developing site or health campus specific energy and emission master plans, that lay out a clear emission reduction path that can be used as a capital decision aid is a priority this coming year. We have complete two of these site plans and will continue to developing the need

I. What % on average of your building portfolio is retrofitted each year in the following categories (if any) - click [here](#) for further information:

Minor retrofits (e.g., low cost, easy to implement measures including caulking, lighting, adding roof insulation, etc.) (%): 5

Major retrofits (e.g., replacing windows and doors, equipment replacement such as boilers, etc.) (%): 3

Deep retrofits (e.g., replacing roof, replacing the heating, ventilation and air-conditioning system with a renewable technology like a ground-source heat pump, etc.) (%): 1

e) Please describe your strategy's [re/retro-commissioning](#) goals (if any)?

The above figure are estimates, many of the retrofit classification are not complete as district project.

There is an ongoing retro commissioning effort at our core sites that is largely driven by the foundation provided by the BC Hydro Custom Optimization Program. The retro commissioning effort, along with increased training, in coordination with our Facility Maintenance and Operations teams is a consistent part of our energy and emission planning.

Strategies for expanding sub-metering architecture and long term building controls on major sites is a planned focus area; resource and funding dependant.

I. What % on average of your building portfolio do you recommission each year?: 5

f) Do you keep records of Refrigerant gases category and refilling volumes?

No

I. If yes, have you included the associated emissions in your reporting?

No

II. What, if any, mitigation approaches have been considered? Please describe.

There are current discussions on the best process to develop and maintain a refrigerant gas inventory for major cooling equipment.

g) How many newly constructed buildings received at least LEED Gold certification in 2018 : 1

I. How many newly constructed buildings did not receive LEED Gold certification?: 0

h) Other actions? Please describe briefly.

An effort to build alliance and develop stakeholder networks is a growing part of our teams role. With the clear health and environment links we recognize that we need to leverage our clinical and populations health's team work that has emission reduction benefits.

Education and empowerment from our Green plus Leader volunteer network is strong and continually creating awareness of climate change and impacts.

Strategic Energy Management Plan

<https://bcgreencare.ca/2018-19-vancouver-coastal-health-strategic-energy-management-plan-semp>

B. Mobile Sources (Vehicles, Off-road/portable Equipment): Fuel Combustion:**3. Actions taken by your organization in 2018 to support emissions reductions from mobile sources.****a) Do you have a strategy to reduce emissions from mobile sources?**

No

I. If yes, what are its goals?

The only criteria for fleet purchases is cost, no consideration of emissions or other environmental impacts.

b) Whether you have a strategy or not (3.a), briefly describe your organization's plans to continue reducing emissions from mobile sources:

I. Over the medium-term term (1-5 years)

No plan to reduce emissions in short or long term, no consideration of emissions or other environmental impacts.

II. Over the long term (6-10 years)

No plan to reduce emissions in short or long term, no consideration of emissions.

I. If you purchased new gas/diesel vehicles, can you briefly explain why vehicles from the other categories were not chosen?

PHSA Purchasing has no does not consider emissions or other environmental impacts in fleet vehicle purchases.

Budget for LDV (cars and SUVs): \$30,000 or less

Replacement at 5-year intervals.

Budget for LDT (pick-up trucks, vans): \$30,000 to \$40,000

Replacement same as above

Budget for HDV (buses with passengers >15): \$50,000 to \$120,000

Replacement same as above

d) How many existing EV charging stations does your organization have in each category:

level 2: 6

level 3: 0

How many level 2 stations (if any) are specifically for your fleet vehicles: 0

How many level 3 stations (if any) are specifically for your fleet vehicles: 0

e) How many EV charging station(s) did you install in 2018 in each category:

level 2: 0

level 3: 0

How many level 2 stations (if any) were installed specifically for your fleet vehicles: 0

How many level 3 stations (if any) were installed specifically for your fleet vehicles: 0

f) Other actions, please describe briefly (e.g. charging station feasibility studies, electrical panel upgrades, etc.)

There are 8 L1 EV chargers as well.

4. Please indicate the number of the vehicles in the following vehicle classes that are in your current fleet (including any purchased in 2018):

Definitions:

- Light duty vehicles (LDVs) are designated primarily for transport of passengers <13 and GVWR<3900kg
- Light duty trucks (LDTs) are designated primarily for transport of light-weight cargo or that are equipped with special features such as four-wheel drive for off-road operation (include SUVs, vans, trucks with a GVWR<3,900kg)
- Heavy duty vehicles (HDV) includes vehicles with a GVWR>3,900 kg (e.g. ¾ tonne pick-up truck, transport trucks)

a) Light duty vehicles (LDVs)

Gas/diesel: 9

b) Light duty trucks (LDTs)

Gas/diesel: 14

c) Heavy duty vehicles (HDV)

Gas/diesel: 12

5. Please indicate the number of the vehicles you plan to replace in your fleet:

How much do you budget per LDV?: 30000

How many LDVs do you plan to procure annually over the next 5 years?: 2

How much do you budget per LDT?: 40000

How many LDTs do you plan to replace annually over the next 5 years?: 3

How much do you plan to spend per HDV?: 120000

How many HDVs do you plan to replace annually over the next 5 years?: 2

C. Office Paper: Indicate which actions your PSO took in 2018:

6. Actions taken by your organization in 2018 to support emissions reductions from paper supplies.

a) Do you have an Office Paper strategy?

No

b) Whether you have a strategy or not (6.a), briefly describe your organization's plans to continue reducing emissions from paper use:

I. Over the medium-term (1-5 years)

We plan to develop a paper strategy and awareness campaign through the Green+Leaders staff engagement behaviour change program.

II. Over the long term (6-10 years)

We plan to continue to collaborate closely with PHSA Supply Chain to advance discussions regarding systemic procurement changes that include environmentally preferable purchasing.

c) Have an awareness campaign focused on reducing office paper use

Yes

d) Purchased alternate source paper (bamboo, hemp, wheat, etc.)

No

e) Other actions, please specify.

Through the Green+Leaders staff engagement and behaviour change program, volunteers were supplied with paperless meeting toolkits to encourage their colleagues to reduce paper use.

There are 75 trained Green+Leaders within Vancouver Coastal Health.

We plan to continue to raise awareness of the importance of emissions reductions from paper supplies through the Green+Leaders behaviour change program. More specifically, we plan to explore a paper strategy and associated campaign to encourage staff to take action and reduce paper consumption in healthcare.