

Vancouver Coastal Health Authority

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](http://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.



# Executive Summary

# Vancouver Coastal Health, CNAR 2018

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 tCO<sub>2</sub>e (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 tCO<sub>2</sub>e 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.



**Mary Ackenhusen**  
President & Chief Executive Officer



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

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

## 2018 Greenhouse Gas Emissions Breakdown and Offsets Applied to Become Carbon Neutral

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

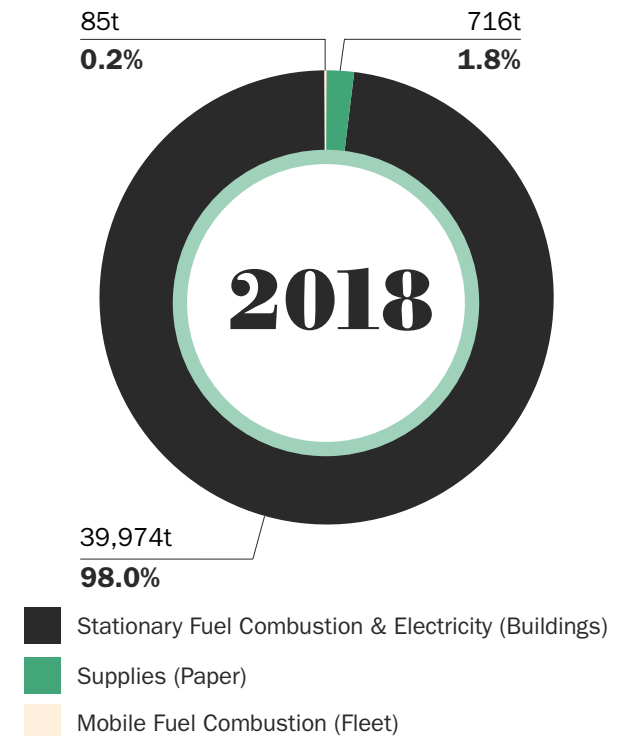
CAS uses various elements of reporting, based on the GHG Protocol Corporate Standard, which has classified carbon reporting into three scopes. Of these three scopes and various elements within each, CAS has determined Vancouver Coastal Health's carbon footprint to comprise of six different greenhouse gases, which are converted to tonnes of carbon dioxide equivalent (tCO<sub>2</sub>e). These main sources of emissions are categorized in three main groupings:

- 1 Stationary Fuel Combustion
- 2 Mobile Fleet Combustion
- 3 Supplies (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.

Vancouver Coastal Health's 2018 carbon emissions were 40,775 tCO<sub>2</sub>e. To become carbon neutral in 2018, Vancouver Coastal Health purchased carbon offsets from the Ministry of Environment at a total cost \$1,069,189.

### 2018 VCH Emission by Source



# 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 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.

VCH (INCLUDES BELLA COOLA AND RW LARGE)					
BUILDINGS, FTE AND WEATHER	2007	2015	2016	2017	2018
Distinct VCH Buildings	n/a	165	165	171	184
% Owned	84%	88%	88%	88%	88%
% Leased	16%	12%	12%	12%	12%
Usable Square Meters <sup>a</sup>	602,766	687,180	690,374	698,979	709,753
Full-Time Employee Equivalents <sup>b</sup>	12,738	14,355	14,568	14,810	15,121
Weather summarized in Heating Degree Days <sup>c</sup>	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 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)).

c. 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.

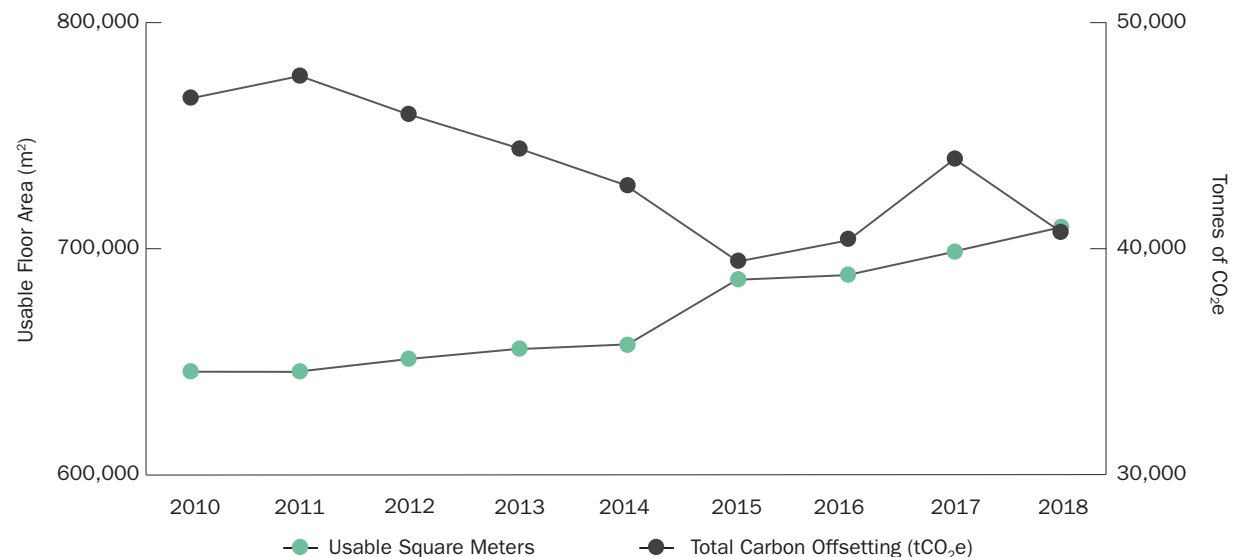
# Changes to Vancouver Coastal Health's Portfolio

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.

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.

Usable Floor Area and Emissions (2010-2018)



# Changes to Vancouver Coastal Health's Portfolio

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.

VANCOUVER COASTAL HEALTH EMISSION OVERVIEW						
OUR CARBON FOOTPRINT (IN tCO <sub>2</sub> e)		2007	2015	2016	2017	2018
CO <sub>2</sub>	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 (tCO <sub>2</sub> e)	50,042	39,491	40,489	44,160	40,775
	Total BioCO <sub>2</sub> Emissions (No Offsets Required) <sup>a,b</sup>	-19	-21	-24	-19	-44
<b>Total Carbon Offsetting (tCO<sub>2</sub>e)</b>		<b>50,023</b>	<b>39,470</b>	<b>40,465</b>	<b>44,141</b>	<b>40,731</b>
\$	Purchased Carbon Offsets <sup>c</sup>	-	\$939,275	\$1,012,050	\$1,102,750	\$1,018,275
	Purchased Carbon Offsets + HST/GST <sup>d</sup>	-	\$986,239	\$1,062,653	\$1,157,888	\$1,069,189
KPI	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

a. 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.

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

c. Purchased Carbon Offsets represent the actual invoice amount to purchase offsets in the specific calendar year.

d. 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 CO<sub>2</sub> Footprint

## 2018 Actions Taken to Reduce CO<sub>2</sub> Footprint

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### 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 tCO<sub>2</sub>e 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 tCO<sub>2</sub>e.

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.

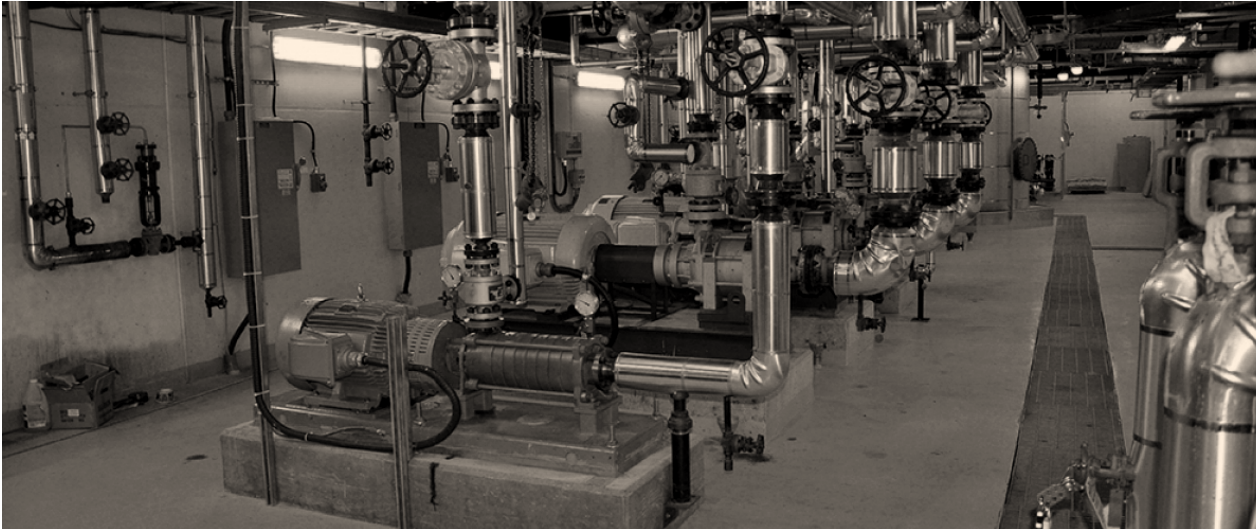
### Supplies (Paper)

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 CO<sub>2</sub> 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 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.

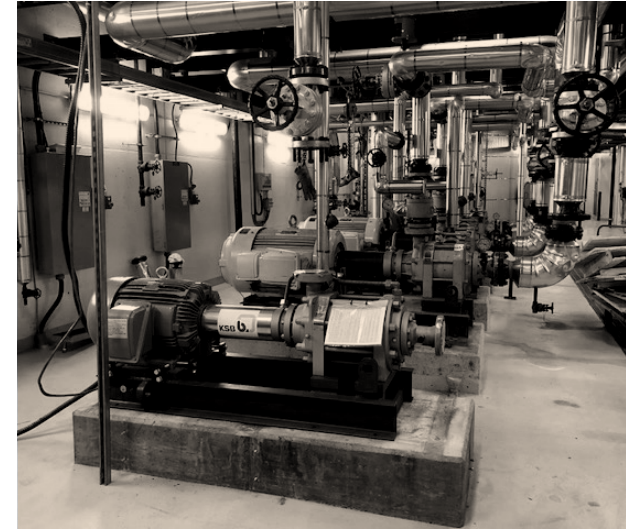
Improving the efficiency of the VGH Energy Centre is an ongoing effort to optimize efficiency and the FMO team are very proactive in maintaining this plant; they have an intimate working knowledge of this complex system.

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... 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.

Vancouver Coastal Health's energy manager, Kori Jones



## Feature Project

# VGH Energy Centre Steam Plant Optimization

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 include 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 tCO<sub>2</sub>e 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 contribution 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.

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