Providence Health Care

2018 CARBON NEUTRAL ACTION REPORT

BRITISH COLUMBIA

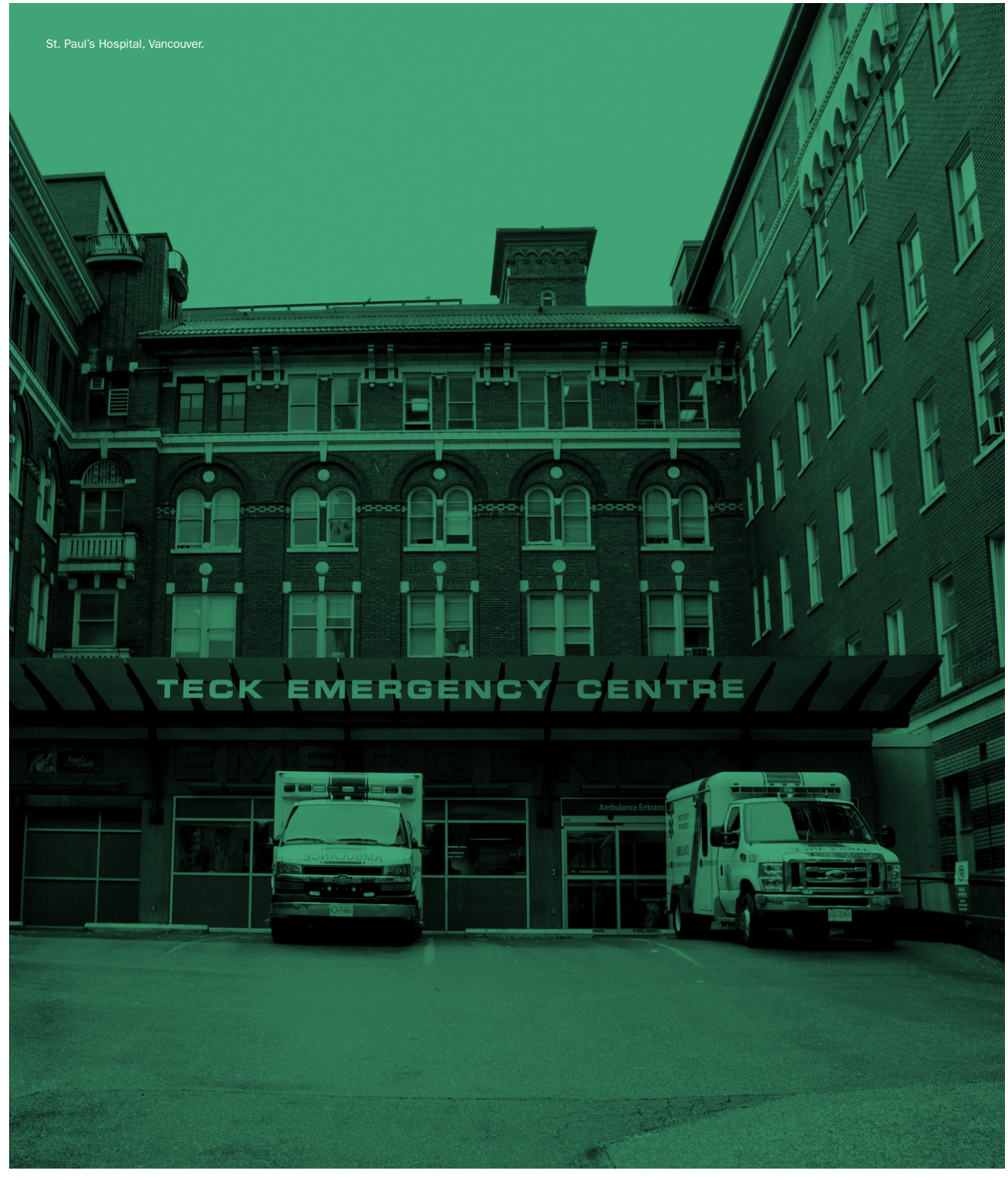
GreenCare™

Providence HEALTH CARE

Declaration Statement

This Carbon Neutral Action Report for the period January 1, 2018 to December 31, 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 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, 2019 Providence Health Care's final Carbon Neutral Action Report will be posted to our website at bcgreencare.ca.



St. Paul's Hospital, Vancouver.

Retirement of Offsets

In accordance with the requirements of the Greenhouse Gas Reduction Targets Act and Carbon Neutral Government Regulation, Providence Health Care (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

Providence Health Care, CNAR 2018

It gives me great pleasure to present Providence Health Care's (PHC) eighth annual Carbon Neutral Action Report (CNAR) for 2018.

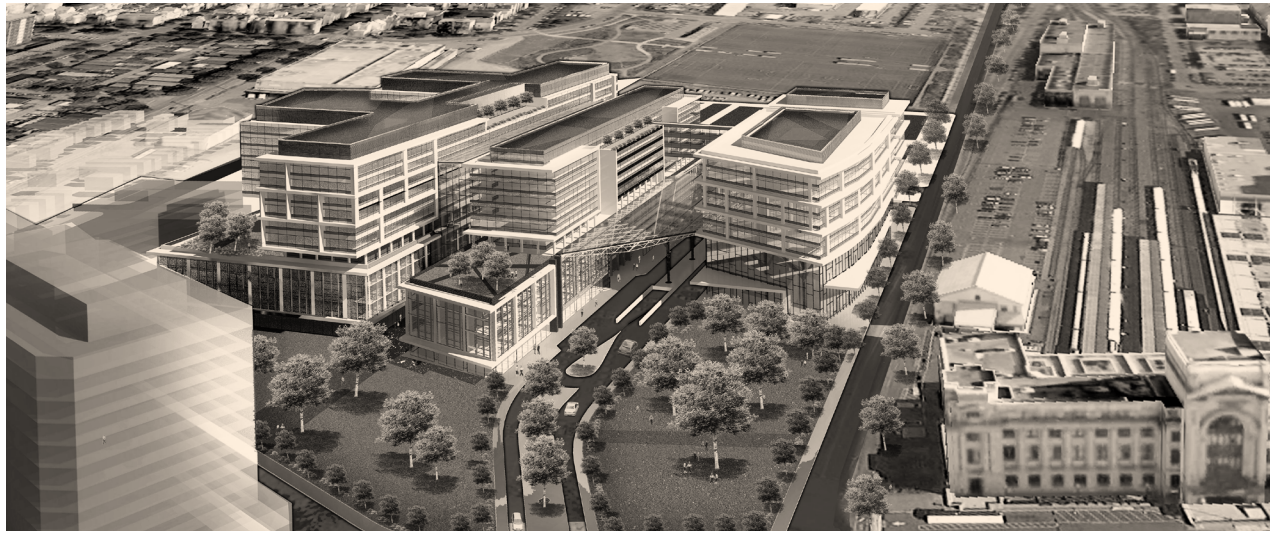
For nine consecutive years, PHC has been proud to be carbon neutral. As an organization driven by innovation and social justice, we believe that our role as health care providers goes beyond caring for individuals and to caring for the environment, too.

Stewardship is one of our key organizational values and throughout our 125 years of providing compassionate and innovative care, teaching and research, we have been responsible and accountable stewards. For us, that includes taking personal responsibility for the carbon footprint produced by our operations and facilities.

In 2018, PHC had a carbon footprint of 11,634 tonnes of carbon dioxide equivalent (tCO_2e), which was offset at a total cost of $334,136.25 ($305,392.50 plus an adjustment to correct the 2017 offset payment). This represents a 0.9 per cent decrease in carbon emissions relative to the 2007 baseline year, during which time the clinical use of our facilities has intensified, as reflected by over 20 per cent increase in full time equivalent staff.

In 2019, we will continue to improve our environmental performance through improved energy efficiency, coordinated efforts, and education. These projects have a positive impact; saving energy, decreasing air pollution, and ultimately adding to the health and wellness of facilities, workplaces and the communities we serve.

Fiona Dalton
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_2 Footprint

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

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

CAS 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 (tCO_2e). In scope carbon emissions are categorized in three main categories:

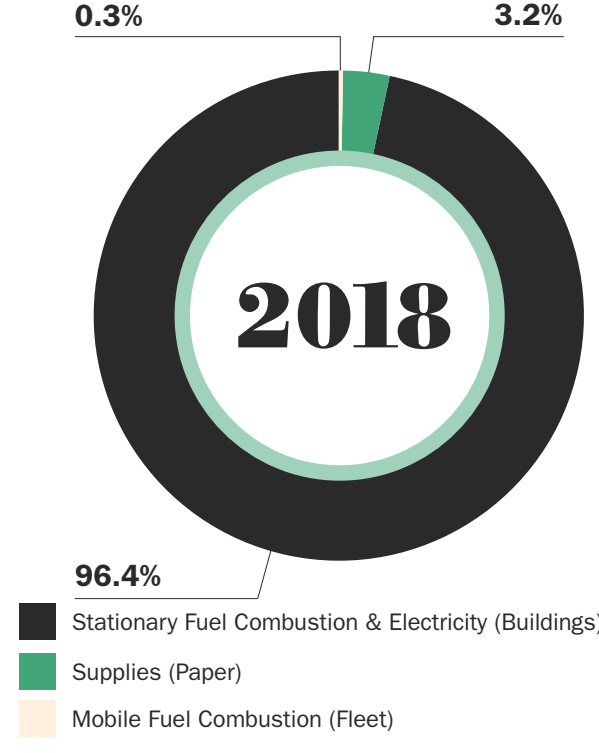
1. Stationary Fuel Combustion
2. Mobile Fleet Combustion
3. Supplies (Paper)

PHC's 2018 Carbon footprint offset was 11,634 tonnes of carbon dioxide equivalent (tCO_2e). That represents a 0.9 per cent decrease in PHC's carbon footprint since 2007.

Over 95 per cent of Providence Health Care's in-scope emissions are attributed to the building portfolio. Within the building portfolio, over 80 per cent of emissions are due to the use of fossil fuels.

To become carbon neutral in 2018, Providence Health Care purchased carbon offsets at a total cost of $334,136.25 ($305,392.50 plus an adjustment to correct the 2017 offset payment).

Providence Health Care's Greenhouse Gas (In-Scope) Emissions by Source



Changes to Providence Health Care's Portfolio

PHC's facility space (measured in usable square meters) has increased by 4.5 per cent since 2007. During the same time, the number of staff (measured in full time equivalents) has increased by over 20 per cent.

Overall since 2007, PHC's carbon footprint has increased only 0.9 per cent, while usable floor area and staff have increased. PHC's 2018 emissions per full-time employee (2.37 tCO_2e/FTE) have decreased by 17 per cent since 2007. PHC's 2018 emissions per unit of floor area (0.06 tCO_2e/m^2) have decreased 3.4 per cent since 2007.

PROVIDENCE HEALTH CARE							
BUILDINGS, FTE AND WEATHER	2007	2013	2014	2015	2016	2017	2018
Distinct PHC Buildings	n/a	40	37	36	36	39	39
% Owned	n/a	91%	92%	92%	92%	91%	90%
% Leased	n/a	9%	8%	8%	8%	9%	10%
Usable Square Meters[a]	174,002	179,222	178,157	177,216	177,159	178,602	181,751
Full-Time Employee Equivalents[b]	4,038	4,748	4,580	4,686	4,760	4,816	4,914
Weather summarized in Heating Degree Days[c]	2,870	2,820	2,627	2,489	2,537	2,922	2,720

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

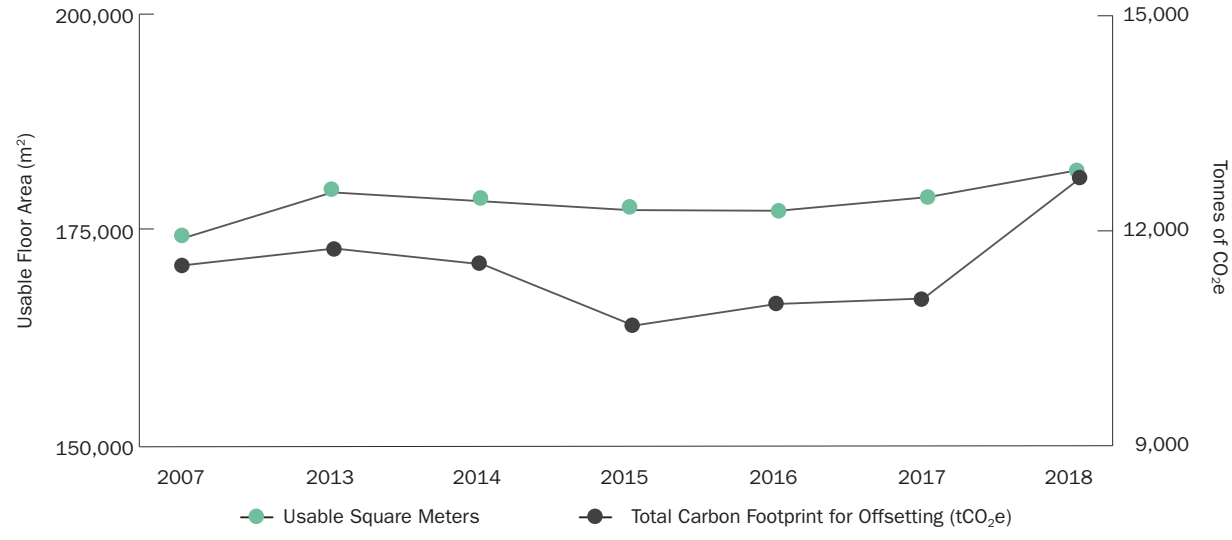
b. Full-Time Employee data was provided by the Ministry of Health.

c. Heating Degree Days (HDD's) are based on YVR Airport data from Environment Canada and is intended to reflect the demand for heating.

Changes to Providence Health Care's Portfolio

The carbon emissions reported are not adjusted for changes in weather. Heating Degree Days (HDDs) is a metric designed to reflect the demand for energy required to heat a building. Emissions per HDD is a metric intended to summarize overall efficiency of delivering heating. PHC's 2018 emissions per HDD (4.3 tCO_2e/HDD) are slightly higher than the baseline year, suggesting that the increases in intensity of use and floor area have overshadowed the impact of energy conservation projects.

Usable Floor Area and Emissions (2007-2018)



PROVIDENCE HEALTH CARE								
	OUR CARBON FOOTPRINT (IN tCO_2e)	2007	2013	2014	2015	2016	2017	2018
CO_2	Mobile Fuel Combustion (Fleet)	15	47	43	45	48	38	26
	Stationary Fuel Combustion & Electricity (Buildings)	11,448	11,442	11,145	10,267	10,569	10,679	11,266
	Supplies (paper)	70	260	358	371	359	356	346
	Total Carbon Footprint (tCO_2e)	**11,533**	**11,749**	**11,546**	**10,682**	**10,975**	**11,074**	**11,638**
	Total $BioCO_2$ Emissions (No Offsets Required) [a,b]	-1	-5	-5	-5	-4	-5	-4
	Total Carbon Footprint (tCO_2e)	**11,532**	**11,744**	**11,542**	**10,677**	**10,972**	**11,069**	**11,634**
	Adjustments / Corrections	0	0	0	0	0	0	1,095
$	**Total Carbon Footprint Offsetting (tCO_2e)**	**11,532**	**11,744**	**11,542**	**10,677**	**10,972**	**11,069**	**12,729**
	Purchased Carbon Offsets	$ -	$294,525	$288,550	$266,925	$274,300	$276,725	$318,225
	Purchased Carbon Offsets +HST / GST	**$328,244**	**$309,251**	**$302,978**	**$280,271**	**$288,015**	**$290,561**	**$334,136**
KPI[c]	Emissions per Full-Time Employee (tCO_2e/FTE)	2.86	2.47	2.52	2.28	2.31	2.30	2.37
	Emissions per Facility Space (tCO_2e/m^2)	0.07	0.07	0.06	0.06	0.06	0.06	0.06
	Emissions per Heating Degree Day (tCO_2e/HDD)	4.0	4.2	4.4	4.3	4.3	3.8	4.3

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

a. As s outlined in the Carbon Neutral Government Regulation of the Climate change Accountability Act, some emissions do not require offsets.

b. It was estimated that Fugitive Emissions from cooling equipment comprise less than 0.01% of PHC'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.

c. KPI's are calculated based on Total Carbon Footprint before adjustments or corrections in order to better reflect performance for the current year.

Actions Taken to Reduce Our CO_2 Footprint

2018 List Of Actions Taken to Reduce CO_2 Footprint

Stationary Emissions (Buildings)

- **Continuous Optimization:** PHC began the post-project or coaching phase of BC Hydro's Continuous Optimization Program at two sites in 2018; at St. Vincent's Langara and Holy Family Hospital.

- **Waste Heat Recovery:** PHC completed a study in 2017 to review replacement options for a failed chiller at St. Paul's Hospital. In cooperation with the energy management team, this study was expanded to explore a low exergy Thermenex design approach to improve heat recovery and further reduce carbon emissions. This project is now underway using Carbon Neutral Capital Program (CNCP) funding.

- **FMO Staff Engagement:** The PHC energy management team has continued to build an engagement strategy with Facilities Maintenance and Operations (FMO) departments. This was focused initially at St. Paul's Hospital, and is now being extended to Holy Family Hospital and Langara Residence. There are plans to expand to all major owned sites over time. The outreach focuses on reviewing energy use in buildings, identification of reduction opportunities, and optimization of existing equipment/plants.

- **Design Guidelines:** PHC's energy management team was involved in further refinements to GreenCare's Energy and Environmental Sustainability Design Guidelines for New Construction and Major Renovation projects with the intent of ensuring health care related new construction and major renovation projects are built to the highest standard of energy efficiency and conservation, within financial constraints. These guidelines are informing the approach to environmental sustainability for the New St. Paul's Hospital Redevelopment.

- **Behaviour Change:** PHC's energy team continues to promote energy conservation and GHG emissions reduction through awareness and behaviour change programs, such as Green+Leaders, GreenCare Community website, the BC Hydro Energy Wise Network program, and FortisBC's Communication Education and Outreach program.

Mobile Fleet Combustion (Fleet and other vehicles)

- PHC has **one 120v electric vehicle charging station** at St. Paul's Hospital, which is located downtown Vancouver in the West End (51 regular plug-ins are also available throughout the parkade).

- PHC continues to partner with Provincial Health Services Authority and Vancouver Coastal Health to provide a **shuttle service** between sites.

- PHC sites offer **248 bike parking stalls** to encourage and enable active transportation by bike.

Actions Taken to Reduce Our CO_2 Footprint

2018 List Of Actions Taken to Reduce CO_2 Footprint

Supplies (Paper)

- 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.
- PHC **encourages teleconferencing** for meetings by installing web- conferencing hardware / software at various sites.

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

- The Green+Leaders behaviour change program at PHC now has a total of **13 active staff volunteers** who help improve the environmental sustainability of PHC operations. Four new volunteers were trained in 2018 for a total of 22 trained since the program began.
- PHC continues to support the GreenCare Community site, which provides tips and toolkits on using less paper, as well as other environmental sustainability initiatives linked to health and wellness. PHC had **483 staff registered on the site** as of 2018.
- PHC offers in-person staff education on **waste management processes** in collaboration with Business Initiatives and Support Services (BISS)[a]. In 2018, 133 staff were trained.
- PHC also offers a **Waste Management Basics Learning Module** online. In 2018, 612 staff completed the training.

a. For more information, please contact BISS Hazardous Waste Coordinator, Teri Guimond, Teri.Guimond@vch.ca

Future Actions to Reduce Our CO_2 Footprint

PHC plans to continue reducing GHG emissions and Energy in the following ways:

Optimizing our Existing Buildings: Planning and implementing GHG / Energy reduction projects in our existing building portfolio by utilizing the Carbon Neutral Capital Program as our primary funding source.

Efficient New Construction: Implementing project-specific energy performance targets to ensure that our new buildings are as energy efficient as possible.

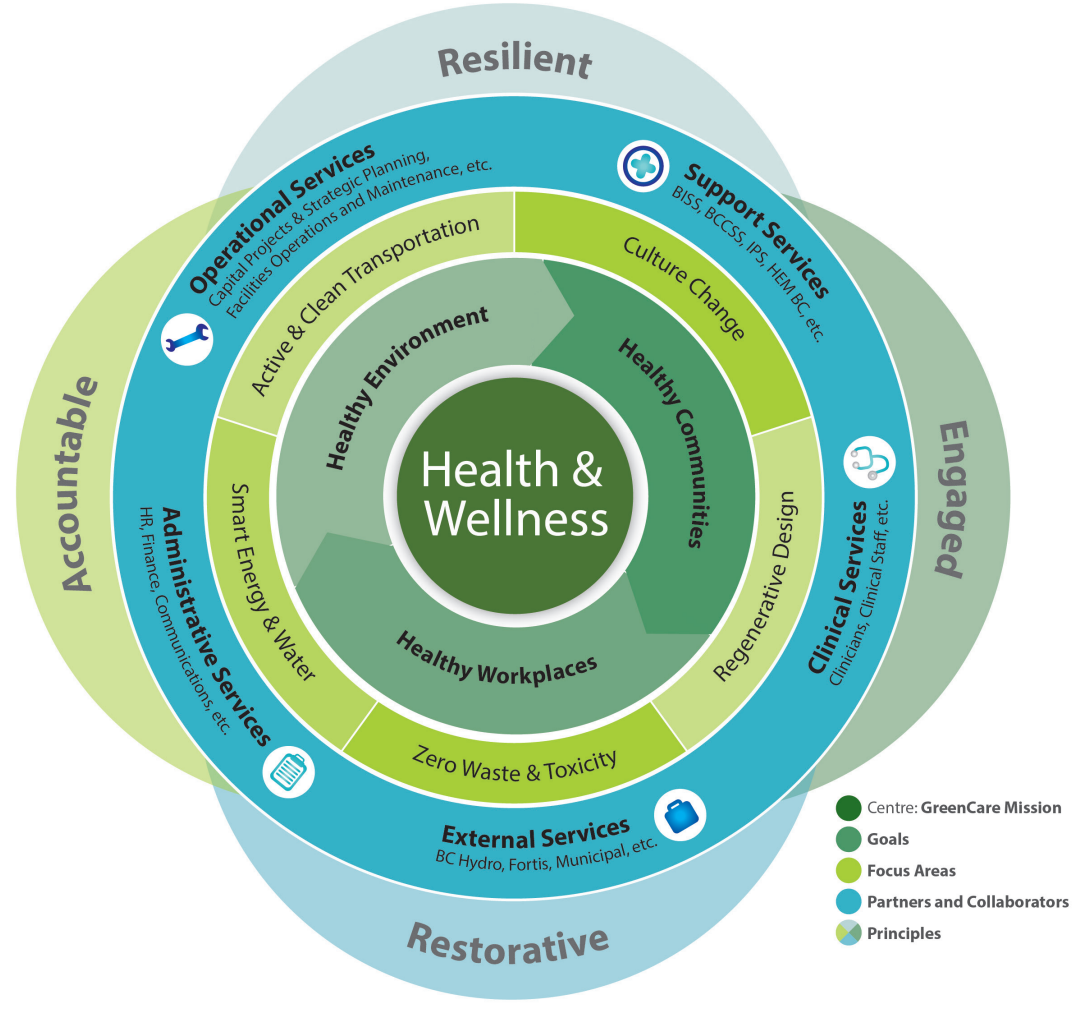
Systemic Change: Leveraging and promoting our Sustainability Policy, and implementing standards, guidelines, and processes to embed energy management principles further into standard operations.

Align with our Core Mandate: Working with GreenCare's refreshed Strategic Framework; PHC's efforts to reduce carbon emissions will take a collaborative approach and seek to support a sustainable and environmentally responsible health care system, which continues to advance health and wellness in its broadest sense.

Behaviour Change: Engaging and educating our staff, via the Green + Leaders program, GreenCare Community and the BC Hydro Energy Wise Network and FortisBC's Communication, Engagement and Outreach program.

Innovation and Demonstration: Promoting innovative approaches and taking other small "seedling actions" to prepare for larger innovation as appropriate opportunities arise.

GreenCare's Sustainability Strategic Framework



Feature Project

Collaborative Asset Management at St. Paul's Hospital Yields Value

In 2018, a major capital project spanning two fiscal years was initiated at St. Paul's Hospital supported by two years of funding through the Carbon Neutral Capital Program (CNCP). This project is the result of collaboration between numerous different stakeholders and departments including PHC's Facilities Maintenance and Operations (FMO) team, PHC Finance, as well as the Energy Management and Capital Projects teams responsible for the PHC Portfolio.

The opportunity first emerged in 2017 when an existing chiller (Chiller 2) failed. Rather than simply replace the chiller with the same or similar equipment, the Energy Management team suggested exploring options to replace the asset while also reducing energy consumption, carbon emissions, and operational costs.

A study was completed in 2018 to explore options and quantify costs and savings. A highly experienced team was hired to complete the study led by Bernie Nelson of C.E.S. Analytics Ltd. and in collaboration with TC Thermenex Ltd. BC Hydro funding was leveraged in order to secure 50 per cent reimbursement for the study, thus reducing the cost to PHC.

The study confirmed that a significant opportunity existed to recover waste heat, thereby reducing energy consumption, carbon emissions, and operational costs. The study proposed to replace Chiller CH-2 (89 Ton dual screw compressor-chiller) which had rejected heat to the atmosphere with a larger capacity heat reclaim chiller incorporating an innovative Thermenex Header system in order to utilize rejected condenser heat to preheat service hot water (for faucets, etc.), provide air handling unit outside air preheat as well as hot deck preheat.

The project is currently underway with all indications to date confirming that anticipated utility savings will be realized. The project is being implemented in conjunction with a broader cooling system upgrade, which includes replacement of cooling towers and piping modifications to resolve persistent flow issues. These systems are interconnected so the energy and water savings quantified also capture those enabled by the cooling tower replacement component of the project.

Technology
Innovative Thermenex waste heat recovery strategy

Energy Savings
An estimated 10,500 GJ per annum of steam, 738,000 kWh/year of electricity, and 18,000 m^3 water.

550 tCO_2e/year
Estimated GHG Reductions.

$707,000
Total Incremental Project Cost*.

$565,975
Anticipated incentive funding through a combined FortisBC and CleanBC incentive program.

$290,000
Operational Cost Savings (estimated utility cost savings including steam, electricity and water)

Business Case
Simple payback of less than 3 years for PHC's investment (ie; less CNCP funding).

Benefits/Co-Benefits
Asset replacement. Increased cooling capacity. Cost effective carbon reduction: $1,200 per tonne GHG reduction (good use of CNCP funding with comparable projects up to $5,000/ tCO_2e).

*Incremental Project Cost refers to the additional cost required to install energy efficient equipment above the cost of replacing equipment to meet building code minimum standard (in this case, above the cost of replacing with a similar chiller).