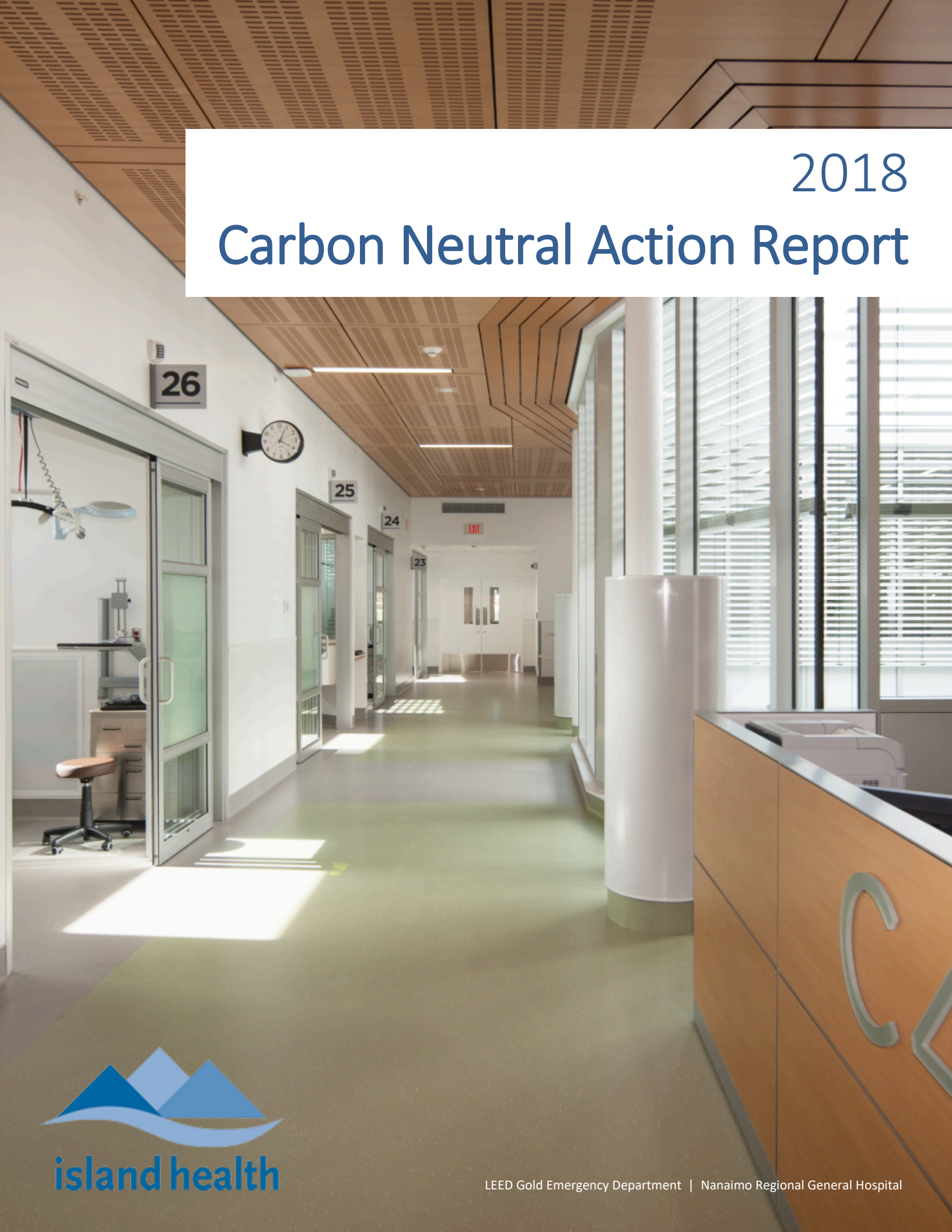


2018

Carbon Neutral Action Report

island health

LEED Gold Emergency Department | Nanaimo Regional General Hospital

CONTENTS

INTRODUCTORY NOTE

This is Island Heath's ninth consecutive year reporting greenhouse gas emissions and purchasing carbon offsets to be carbon neutral. This report discloses the emissions that require offsetting for 2018, year over year emissions trends, and strategies for future reductions. Island Health remains committed to the provincial government's legislation and climate action plans as per the *Climate Change Accountability Act* (formerly the *Greenhouse Gas Reduction Targets Act*) and *CleanBC*.

Despite the immediate and long term benefits of emissions reduction projects, obtaining funding is a challenge. Due to competing priorities for health care dollars, it is often not possible for the health authority to direct investment into such projects. Fortunately, Island Health has accessed funding from the provincial Carbon Neutral Capital Program since 2014. This program provides critical annual funding for minor projects to reduce emissions. Island Health has demonstrated success with this capital by reducing greenhouse gases, and simultaneously avoiding higher operational costs while improving infrastructure. Nevertheless, the Carbon Neutral Capital Program alone will not provide enough funding to achieve the ambitious provincial reduction targets. Island Health continues to work with the Ministry of Health, Climate Action Secretariat, BC Hydro, FortisBC, and other public sector organizations to look for funding mechanisms for deeper decarbonization.

Facility renewal presents a unique opportunity to reduce Island Health's emissions. The experience gained with the two new North Island Hospitals completed in 2017 is informing the planning of a new hospital in the Cowichan Valley. The communities we serve are growing and so is our level of service to meet the demand. This can make it more challenging to reduce emissions as we expand our operations. To mitigate this, Island Health will continue its innovative work to ensure new construction is more energy efficient and emits less greenhouse gases than the buildings being replaced.

Not only is Island Health constructing more efficient buildings, we are also taking action to reduce emissions from our vehicle fleet and office paper consumption. In 2018 Island Health began leasing two new zero-emissions vehicles, in line with the provincial *CleanBC* strategy, while promoting cleaner air in our communities. In addition, we began using a tree-free paper which reduces our emissions and overall environmental impact.

As we work towards achieving the provincial emissions reduction target, climate change has also become a focus for health care services and facilities. 2018 was another difficult year in BC, amplified by a summer with higher than average temperatures, wildfires, and smoky skies. Vancouver Island also endured an extreme wind storm at the end of 2018, challenging Island Health's infrastructure and operations. Consequently, we are committed to planning and adapting for a future of climate extremes. Island Health remains a leader in the province with our involvement in advanced climate adaptation assessments and emissions reduction strategies.

James Hanson
Vice President
Operations and Support Services
Island Health

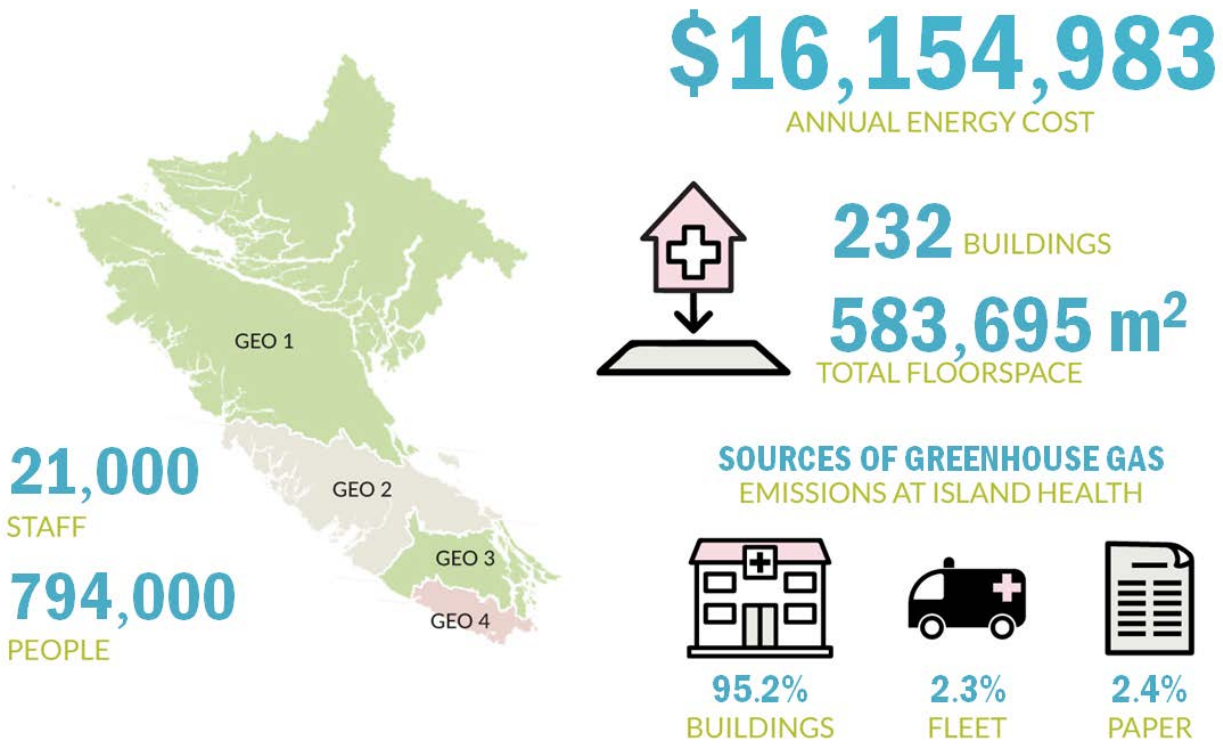
1. Overview

Island Health's 2018 Carbon Neutral Action Report for the period January 1st, 2018 to December 31st, 2018 summarizes our emissions profile, the total offsets required 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.

By June 30, 2019, Island Health's final Carbon Neutral Action Report will be posted to our website at www.islandhealth.ca.

About Island Health

Approximately 21,000 health care professionals, technicians, and support staff at Island Health provide health care to more than 794,000 people on Vancouver Island; the islands in the Salish Sea and Johnstone Strait; and the mainland communities north of Powell River and south of Rivers Inlet. Health care facilities are Island Health's largest source of greenhouse gas emissions (GHG). Compared to the previous year, Island Health's GHG emissions from buildings decreased 6.7%. Emissions intensity (GHG emissions per square meter of floor area) has decreased by 30% since 2007. Between 2017 and 2018 the total floor space decreased by 3.5% or nearly 21,000 square meters. The two new North Island Hospitals increased the floor area in 2017 but subsequent to completion the old Campbell River Hospital was decommissioned, along with the release of a number of leases associated with construction and transition. Since becoming carbon neutral in 2010, the health authority's total floor space has increased by 16.6%. In spite of that, Island Health's GHG reduction target remains the same which means as we grow it becomes more challenging to meet our target.



Commitment

Island Health's leadership team highlighted the importance of energy conversation and environmental sustainability in the 2018/2019 Annual Priorities Plan. With the objective to reduce Island Health's climate impact, the leadership team reaffirmed its commitment to advance the organization as close as possible to the provincial emissions reduction target. BC's 2007 *Greenhouse Gas Reduction Targets Act* set targets of 33% GHG emissions reduction below 2007 levels by 2020 and 80% reduction by 2050. On May 7, 2018, the *Greenhouse Gas Reduction Targets Act* was replaced by the *Climate Change Accountability Act*, which sets additional legislated targets of 40% reduction in carbon emissions from 2007 levels by 2030 and 60% reduction by 2040. The 80% reduction by 2050 remains the same.

The recently released *CleanBC* plan outlines a pathway for climate action to support the province in achieving these GHG emissions reduction targets. Encouraging the use of clean and renewable energy, all new buildings will be required to be 'net-zero energy ready' by 2032. The plan also supports the adoption of zero emissions vehicles, with a forthcoming five-year plan for reducing emissions from public sector vehicle fleets.

Furthermore, the province requires all public sector organizations (PSOs) to achieve the Leadership in Energy and Environmental Design (LEED) Gold standard, or an equivalent certification, in all new provincially owned and leased facilities. Island Health operates two LEED Gold facilities, the Patient Care Centre in Victoria and the Emergency Department at Nanaimo Regional General Hospital, as well as one LEED Silver facility – Oceanside Health Centre in Parksville. In 2017, the organization opened two new North Island campuses in Campbell River and Comox, both of which were designed to be LEED Gold certified.

These commitments help Island Health mitigate and adapt to climate risks, but more action is required to prepare for climate change. The *Climate Change Accountability Act* recognizes this and starting in 2020 requires the province to report, every second year, on the risks from changing climate, the progress being made to reduce the risks, the actions taken to achieve the progress, and plans for continued progress. Island Health has started taking the necessary steps to enhance adaptive capacity and is the first health care organization to conduct a full climate vulnerability assessment at a hospital in Canada. Through a range of assessments, the organization is identifying risks to critical infrastructure and operations, in order to engage stakeholders and build resilience. More information about these projects can be found in Section 4. Climate Adaptation (page 12).

2018 Emissions and Offsets

Under BC's *Climate Change Accountability Act*, Island Health has been required since 2010 to report and offset its emissions to achieve carbon neutrality.

Table 1: Island Health's Total Emissions and Offsets for 2018

GHG Emissions Created in Calendar Year 2018	
Total Emissions (tCO_2e)	29,738
Total $BioCO_2$[1]	858
Total Offsets (tCO_2e)	28,880
Adjustments to GHG Emissions Reported in Prior Years	
Total Emissions (tCO_2e)	41
Total Offsets (tCO_2e)	40
Grand Total Offsets for the 2018 Reporting Year	
Grand Total Emissions for Offsetting (tCO_2e)	28,920
Total Offset Investment (x $25/tonne) + (5% GST)	$759,150

To reduce its emissions to net-zero, Island Health invests in emission-reduction projects by purchasing BC-based offsets. The offset payments provide incentives to BC-based projects that reduce emissions through GHG removal or avoidance according to provincial regulations. These projects support British Columbia's green economy and provide social, environmental, and economic benefits to all British Columbians. The offset projects can be viewed on the BC Carbon Registry. Island Health pays the invoice issued by the Ministry of Environment in an amount equal to $25 per tonne of CO_2e plus GST for each reporting year.

[1] *"Biogenic" portion ($BioCO_2$) of the emissions from biomass, renewable natural gas and biofuels are not required to be offset due to their renewable source.*

Emission Trends

Since 2010, Island Health has been reporting and offsetting GHG emissions using the province's SMARTTool program. Figure 1 graphs the change in total emissions, exempt emissions, and emissions for offsets from 2010 to 2018 compared to the 2030 target (40% lower than the 2007 level). Exempt emissions increased in 2015 onward due to the purchase of renewable natural gas from FortisBC, which reduced the total offsets that Island Health needed to purchase. Table 2 provides additional detailed information for the same 2010-2018 period, including offset costs and emissions per full time equivalent employee.

Figure 1: Change in Island Health Emissions and Offsets, 2010 to 2018

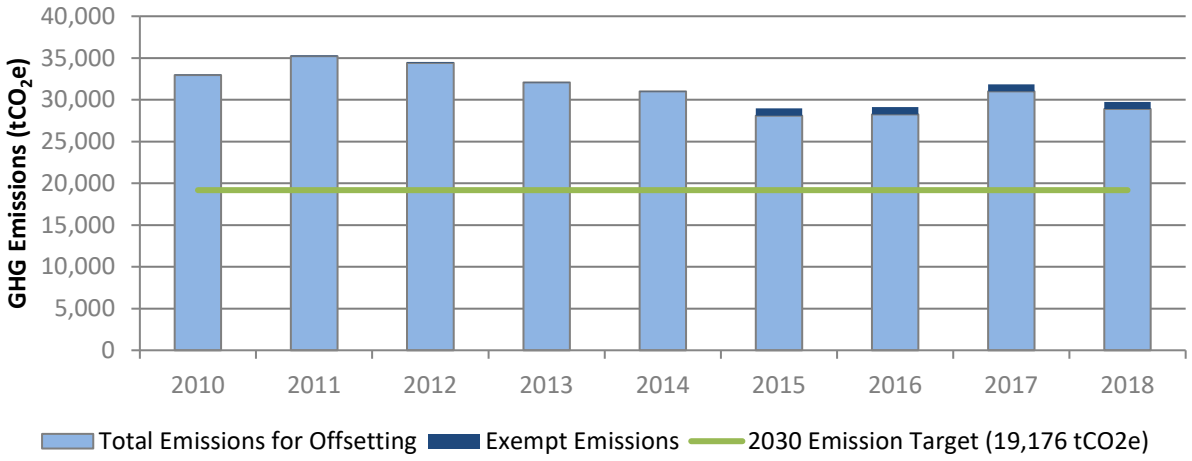


Table 2: Island Health's Emissions and Offset Figures, 2010 to 2018

Year	Baseline 2007	2010	2011	2012	2013	2014	2015	2016	2017	2018
Total Emissions	31,960	32,993	35,279	34,470	32,123	31,050	28,957	29,147	31,860	29,738
Exempt Emissions	n/a	61	59	52	54	56	866	870	864	858
Emissions for Offsetting	n/a	32,938	35,226	34,423	32,075	30,994	28,091	28,277	30,996	28,880
Offsets Cost plus GST ($)	n/a	822,835	875,250	859,125	841,260	813,068	737,310	743,321	814,590	759,150
Emissions per FTE[2]	2.66	2.90	3.06	2.87	2.67	2.55	2.19	2.12	2.26	2.00

[2] The full time equivalent (FTE) data, provided by the Ministry of Health to all BC health authorities, was used to ensure consistency in methodology for the healthcare sector's Carbon Neutral Acton Reports.

Island Health's total emissions peaked in 2011 when the Patient Care Centre opened in Victoria. Emission levels steadily decreased between 2011 and 2015. The 2016 emission level was slightly higher (0.5%) than the 2015 level due to a cold winter season and a number of delayed emission-reduction projects. Emissions in 2017 increased by 10% compared to the 2016 level, with the opening of two new North Island Hospitals in Campbell River and Comox. Total emissions in 2018 decreased by 6.7% compared to 2017.

As of 2018, Island Health has managed to decrease emission from the peak level in 2011 despite an increase in total floor space over the same period. Emissions per full time equivalent have been steadily declining since 2011 until 2016 and stayed well below the peak value. This is similar to the emissions per square meter of floor area which has decreased by 30% since 2007[3]. What this means is Island Health is making progress in reducing emissions but the demand for our service has been steadily increasing. To achieve the province's target for 2030, the total emissions level needs to drop by 34% in the next decade regardless of increases in services. All health authorities require additional support and resources to reach the 2030 targets and beyond.

Buildings make up 95% of total emissions, with the rest coming from fleet vehicles and office paper (outlined in Table 3 below). In 2018, emissions from buildings decreased by 6.7% from the previous year. This decrease in emissions can be attributed to the successful projects completed in prior years. Emissions level peaked in 2017 due to the construction and opening of two new North Island Hospitals. After the opening of the hospitals, less business travel was required and emissions from fleet declined to the lowest level since reporting began. Emissions from office paper increased because of a rise in paper use by approximately 10%.

Table 3: Island Health Emissions by Source, 2010 to 2018

Emission Source [tCO2e]	2010	2011	2012	2013	2014	2015	2016	2017	2018
Fleet	922	901	878	892	911	888	897	978	693
Office Paper	831	747	717	714	691	706	677	687	724
Buildings Owned & Leased	31,241	33,631	32,874	30,517	29,448	27,363	27,573	30,195	28,321
Total Emissions[4]	**32,994**	**35,279**	**34,469**	**32,123**	**31,050**	**28,957**	**29,147**	**31,860**	**29,738**

Carbon Neutral Capital Program

In 2014, the province's *Carbon Neutral Capital Program* (CNCP) was expanded to include funding for BC's health authorities. Since then, Island Health has been able to access this capital funding to implement GHG emissions reduction projects. Table 4 provides a summary of Island Health projects funded by the CNCP from 2014-2019. The five-year average cost of reducing emissions through these projects is $2,927/tCO2e (Total Expenditure divided by Emission Reduction). This value is being used to project future emissions reduction from CNCP funding only. The emission reduction for the 2018/19 fiscal period improved from the previous year, but remains lower than the five year average.

[3] Emissions per square meter of floor area are calculated from Island Health's 2018 Strategic Energy Management Plan

[4] Total emissions include both exempt emissions and total emissions for offsetting.

Table 4: Summary of CNCP Projects

Fiscal Year	Project Description	Total Expenditure ($)	CNCP Funding ($)	Expected Annual Savings ($)	Emission Reduction (tCO_2e/yr)	Average Cost of Emission Reduction ($)
F2014/15	Lighting upgrade Boiler optimization HVAC zoning	1,296,278	902,818	194,452	507.5	2,554
F2015/16	Laundry plant upgrade Boiler plant replacement Domestic hot water decouple Zone isolation and lighting	1,474,278	828,505	172,639	525.2	2,807
F2016/17	Heat recovery chiller Exhaust air heat recovery Zone control Domestic hot water decouple	1,354,402	817,953	104,640	654.7[5]	2,069
F2017/18	Boiler & Heating Plant upgrade Heat recovery Heating ventilation & air conditioning (HVAC) upgrade	1,305,125	817,953	75,653	238.9	5,463
F2018/19	Electronic Zone Control OR Zone Control HVAC Zoning and Scheduling	1,147,500	821,370	89,453	321.0	3,576
	Average	**1,315,517**	**837,720**	**127,367**	**449.4**	**2,927**

Escalating construction costs continued to challenge Island Health's ability to execute CNCP projects this year. Originally, the plan was to proceed with four projects but construction bids came in higher than what was budgeted for three of them. As a result, one of the four projects valued at $175,000 was cancelled and the CNCP funds re-allocated to the two other projects where the bids were over budget. The cancelled project was estimated to have reduced GHG emissions by 162.9 tCO_2e. From Table 4, it can be noted that had the health authority been able to complete all four projects, emissions reduction would have been more in line with historical levels at 483.9 tCO_2e/yr.

All three projects completed this year resulted in reduced energy waste and GHG emissions by adding building controls hardware and programming to make the facilities 'smarter'. The areas affected now experience lower ventilation rates and temperatures that are allowed to fluctuate whenever the space is not occupied. Analogous to turning off the faucet and lights when leaving the washroom, the building automation system now minimizes ventilation rates and air conditioning to spaces when there is nobody in them, thus reducing energy waste and emissions in the process. Island Health will pursue similar projects in the future since they offer substantial GHG emissions reduction at a modest cost and they follow the first principle of energy management which is to 'eliminate waste'.

[5] The number was updated from 630.6 tCO_2e based on the latest calculations.

2. Emissions Reduction Projects in 2018

During the 2018/19 fiscal year, HVAC conservation measures and continuous optimization delivered the greatest reduction in emissions. The zoning and scheduling project and continuous optimization at the Nanaimo Regional General Hospital were responsible for over 70% of the emissions reduction in 2018.

The following table is a summary of various projects completed in the 2018/19 fiscal year along with their associated costs, savings, and emissions reduction. The incremental cost per tonne of GHG avoided and payback on incremental cost are calculated based on this information.

Table 5: Summary of Emission Reduction Projects in the 2018/19 Fiscal Year

Project Type	Total Cost ($)	Incremental Cost ($)	Total Annual Cost Savings ($)	GHG Avoided (tCO2e/yr)	Incremental Cost per Tonne of GHG Avoided ($)	Payback on Incremental Cost (yrs)[6]
Boiler and Heating Plant Upgrades	502,500	79,200	3,630	14.86	5,329	18
Continuous Optimization	400,000	400,000	68,570	218.05	1,834	5
Lighting	110,000	110,000	14,502	2.46	44,627	5
HVAC Conservation Measures	1,147,500	1,147,500	92,910	321.02	3,575	10
2018/2019 Total	**2,160,000**	**1,736,700**	**179,612**	**556.39**	**n/a**	**n/a**

In Table 5, the Total Cost is the cost required to implement a project. When a piece of existing equipment is being replaced, the Incremental Cost is the extra cost required to achieve a higher efficiency from the equipment being replaced (e.g. mid-efficiency boilers being replaced with high efficiency boilers). When an energy efficiency project is a new addition to the existing infrastructure (e.g. adding a device to reduce existing motor use), the Incremental Cost equals the Total Cost of the project.

Incremental Cost per Tonne of GHG Avoided is the Incremental Cost divided by GHG Avoided. This measure gives a clear indication of the cost of emissions reduction by project type. HVAC upgrades, continuous optimization, and heat recovery projects are the most cost-effective in terms of reducing emissions. Lighting upgrade projects provide the lowest greenhouse gas emissions savings because hydroelectricity in BC is mostly renewable and therefore has a low emissions impact. Consequently, the incremental cost per tonne is high. Nevertheless, such projects typically have a good payback rate and improve lighting quality for building occupants. Natural gas boiler upgrades are cost-effective due to relatively low natural gas rates and FortisBC incentives, but the upgrade from a less efficient to a more efficient boiler produces only marginal GHG reductions.

Payback on incremental cost is calculated by dividing incremental cost by total annual cost savings, net of BC Hydro and FortisBC rebates. The exact payback varies for each individual project, with the longest payback rate being for a boiler upgrade. Most of these measures have a lifespan of 15 to 20 years and generate significant cost savings regardless of their emission-reduction potential. As Island Health electrifies its heating requirements and provides cooling through a longer cooling season there will be considerable need to find energy efficiencies so that utility budgets are not exceeded.

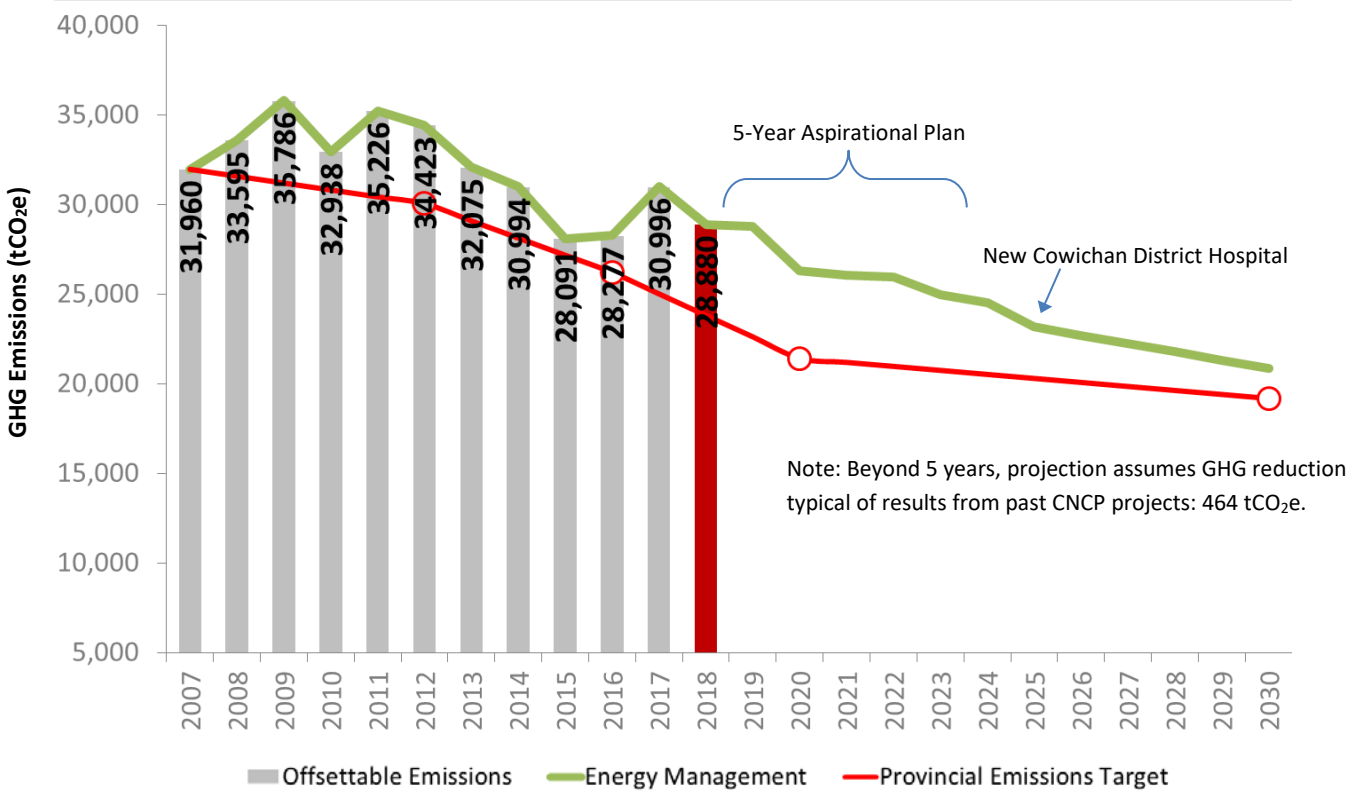
[6] Note that payback period is net of BC Hydro and FortisBC rebates.

3. Strategies to Reduce Emissions

Most of Island Health's building-related GHG emissions are from fossil fuels, primarily natural gas. In areas where natural gas is available, it is widely used for space and hot water heating, as well as for laundry and cooking. The future emissions reduction strategy for buildings will be centred on improving existing buildings, ensuring new buildings perform to high standards shortly after construction completion, and utilizing cleaner energy sources.

The green line in Figure 2 represents the expected emissions reduction resulting from a steady investment from the Carbon Neutral Capital Program. The average cost of reduction is $2,929 per tonne of CO_2e.

Figure 2: Island Health Emissions, Targets and Projections



The 5-Year Aspirational Plan has a total cost in 2018 dollars of $21,400,000 and an annual cost savings of $1,570,000. The total GHG emissions reduction from that investment is 3,920 tCO_2e per year, with a cost of $5,459 per tCO_2e. Deep retrofits of existing infrastructure is expensive but will be necessary to meet the reduction targets.

Existing Buildings

In existing buildings, efforts will continue to focus on minimizing waste and improving efficiency of existing assets. This will require continued close collaboration between Energy Department staff and Facilities, Maintenance and Operations (FMO). In addition to Carbon Neutral Capital Program projects, more effort will be made to uncover opportunities that require relatively small upfront investment, such as system re-commissioning, continuous optimization including scheduling, optimized controls, and improved maintenance (e.g. coil cleaning, steam trap repair, and insulation). Considering future climate is also

important when replacing ventilation and air conditioning systems. Unfortunately adding cooling to existing infrastructure can be very challenging and disruptive to the operations of health care facilities.

New Construction

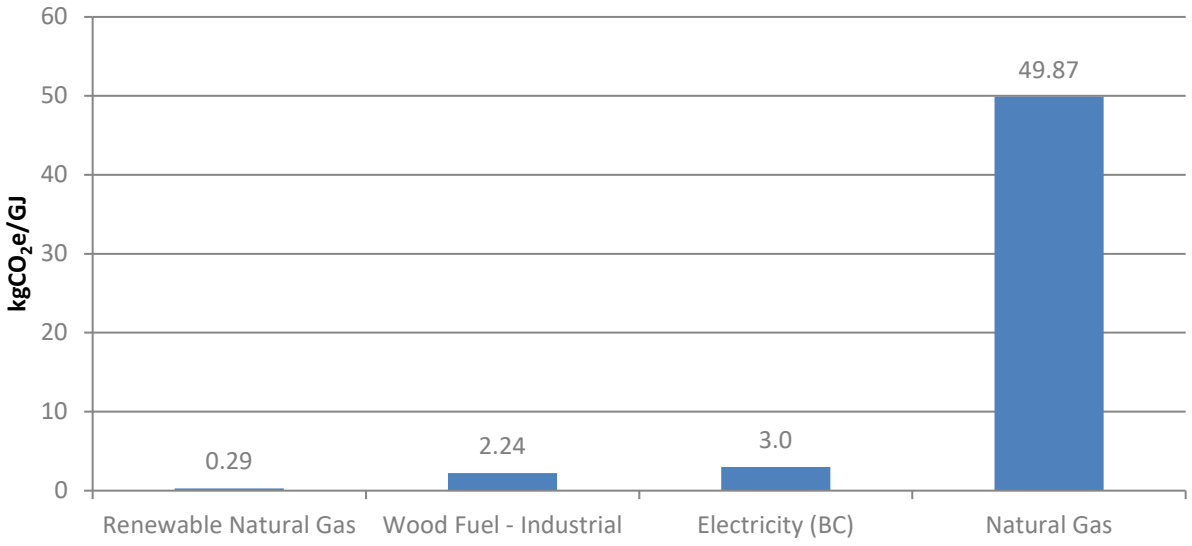
The practice of setting aggressive targets for new construction projects will continue in order to avoid net increases in GHG emissions as Island Health expands. To that end, early work in the business planning stages of the new hospital for the Cowichan Valley includes energy modeling of various design features in an effort to reach a design that meets both a 'net zero energy ready' and a 'net zero carbon' level of performance. Whether these stretch targets can be achieved within the financial constraints of the project remains to be determined. In addition, future climate projections are being incorporated into the design and planning to ensure this new facility is capable of handling extremes in weather anticipated over the life-cycle of the building. As per provincial policy, this new hospital will be targeting LEED Gold certification.

Clean Energy

Another key strategy for reducing GHG emissions is to increase the share of low-carbon energy sources. Island Health has transitioned towards cleaner energy by electrifying facilities with the installation of heat recovery systems powered by BC's clean electricity, using renewable energy systems such as solar thermal and solar electric panels, as well as by procuring renewable natural gas. The health authority will continue to explore alternatives to fossil fuels including biomass.

Figure 3 illustrates the comparative emission factors for four energy sources: natural gas, electricity, wood fuel and renewable natural gas. Natural gas produces the most emissions while renewable natural gas produces the least.

Figure 3: Emission Factors by Fuel Type[7]



[7] Emission factors extracted from 2018 BC Best Practices Methodology for Quantifying Greenhouse Gas Emissions.

Fleet

Emissions from Island Health's fleet represent 2.3% of the total emissions in 2018. The main strategy for managing fleet emissions is to improve the fuel efficiency of vehicles and to consider zero-emissions vehicles, as new vehicles are purchased or leased, that are compatible with fleet vehicle uses.

Island Health's Fleet Services began leasing two new electric vehicles in 2018. One vehicle is available in the staff vehicle pool, while the other is intended to be utilized by Community Health. A Level 2 charging station was installed at Gorge Road Hospital for fleet vehicles. Island Health is also assessing the feasibility of installing charging stations to support Community Health. Looking forward, Fleet Services will continue evaluating zero-emissions options for new vehicles including medium duty trucks, while expanding the staff vehicle pool to sites across the Island.

Paper

Emissions from paper represent 2.4% of the total emissions in 2018. The biggest opportunity for paper emission reduction is to use less paper through digitalization and changing procedures or behaviour. Information Management/Information Technology (IM/IT) supports behaviour change through an ongoing Print LESS campaign with simple actions for employees. In addition, Island Health uses a paperless ePay system for online pay information reducing the need to send paper statements to all employees.

In 2018, Printing Services began using an alternative paper created from the residue waste of sugar production. Alternative papers are reported as having the same emissions factor as 100% post-consumer recycled content paper, and therefore can contribute to a reduction in office paper emissions. This paper source also has other benefits such as diverting sugarcane waste from incineration, using less toxic bleaching chemicals, and lowering Island Health's paper costs. In 2019, Operations and Support Services will make this alternative paper the standard for all of Island Health's 8½ x 11 office paper.

4. Climate Adaptation & Resilience

A changing climate has the potential to impact the health of our communities, as well as health care operations and infrastructure. Such impacts were experienced across the Island in 2018 with smoky skies, rising average temperatures, and windstorms. To prepare for a future of climate extremes, Island Health is working to identify vulnerabilities and build resilience.

In 2018, Island Health participated in an innovative cross dependency infrastructure study at the Nanaimo Regional General Hospital. Led by the Climate Action Secretariat, with funding from Natural Resources Canada, Island Health collaborated with regional stakeholders to complete a deep analysis of the region's exposure to climate change and extreme weather events. The results of this analysis include access to the XDI platform, a tool to identify current risks and associated costs, which can be used for decision-making and enhancing resilience.

The following climate change adaptation work was completed in 2018:

- Infrastructure Cross Dependency Risk Analysis study led by the Climate Action Secretariat
- 2018 Facilities Maintenance and Operations (FMO) & Extreme Weather Survey Summary Report
- 2017 Heat Wave Survey Results Report

Future climate adaptation tasks include:

- Review the results of Public Safety Canada's Regional Resilience Assessment Program
- Facilitate a climate change task force at Nanaimo Regional General Hospital in response to the PIEVC climate change vulnerability assessment
- Conduct indoor air quality monitoring with Health Canada and National Research Council Canada to evaluate intervention strategies in response to forest fire smoke
- Test Island Health's Climate Adaptation Assessment Toolkit with at least one owned site

5. Sustainability Initiatives

Many departments at Island Health are actively taking measures to achieve greater efficiency and reduce pollution and consumption of resources. Below are highlights of these activities in 2018.

Water Conservation

Island Health reviews water costs and consumption at all major owned sites through an online utility monitoring platform. Facilities with higher consumption and water rates are prioritized for further analysis. This analysis will inform future opportunities for identifying water conservation measures. The Energy Department also incorporates a water performance review into quarterly meetings with the FMO department. In addition to water monitoring, all new buildings are constructed with high water efficiency goals. Island Health's LEED certified buildings are operating with lower water usage rates relative to similar facilities.

Behaviour Change

In 2018, Island Health continued its involvement with the BC Hydro Energy Wise Network, where funding and coaching are available to support behaviour change campaigns. One of the campaigns is detailed in Appendix A.

The Energy Department hosted a three-part webinar series for building operators across the organization. On average 40 staff attended each webinar to learn how to identify controls based issues and improve efficiencies. Following the webinars, 10 operators participated in internal continuous optimization processes. This exercise reinforced the webinars' themes, while providing the opportunity to apply best practices on site.

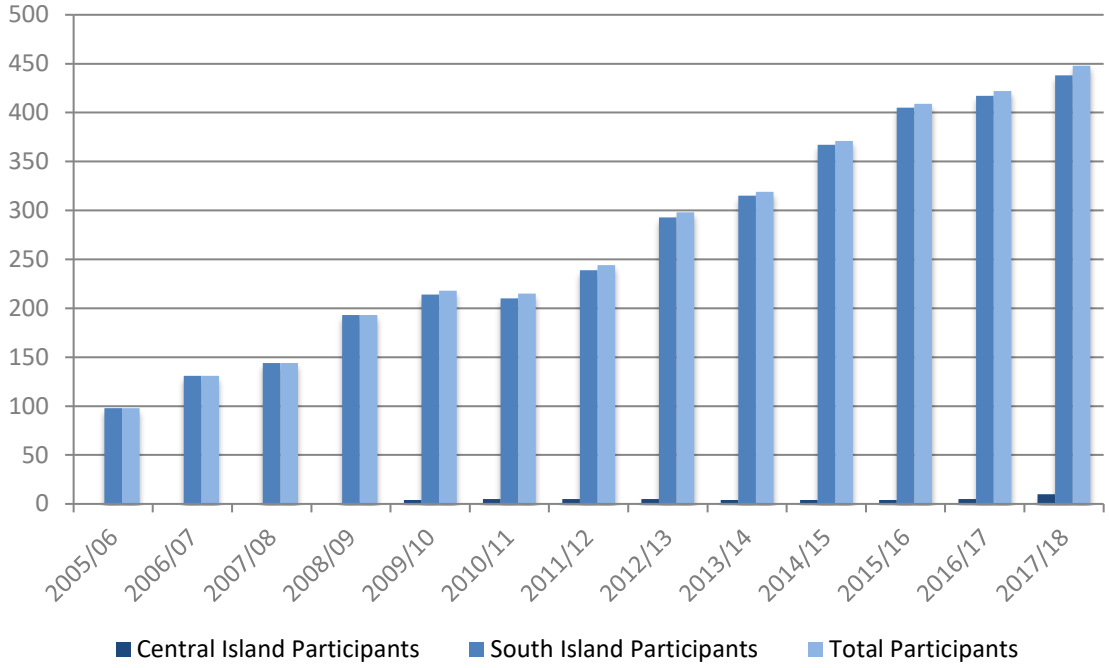
Single-use Plastic Waste Reduction

Staff members at Island Health are interested in reducing single-use plastics in their departments. Following an awareness campaign Nanaimo Regional General Hospital's cafeteria stopped providing plastic cups, lids, and straws in 2018. Instead they are encouraging staff and visitors to bring their own reusable drinking containers to fill at a water dispenser. As a result, up to 187,200 plastic cups will be diverted from Island Health's waste streams within the next year. The Surgical Daycare Unit in Nanaimo also took action to reduce plastic pollution. They began testing a paper bag for patient belongings in place of plastic. These departments are showing their ingenuity and dedication to finding solutions to the single-use plastic dilemma facing the health care sector.

Transportation Demand Management

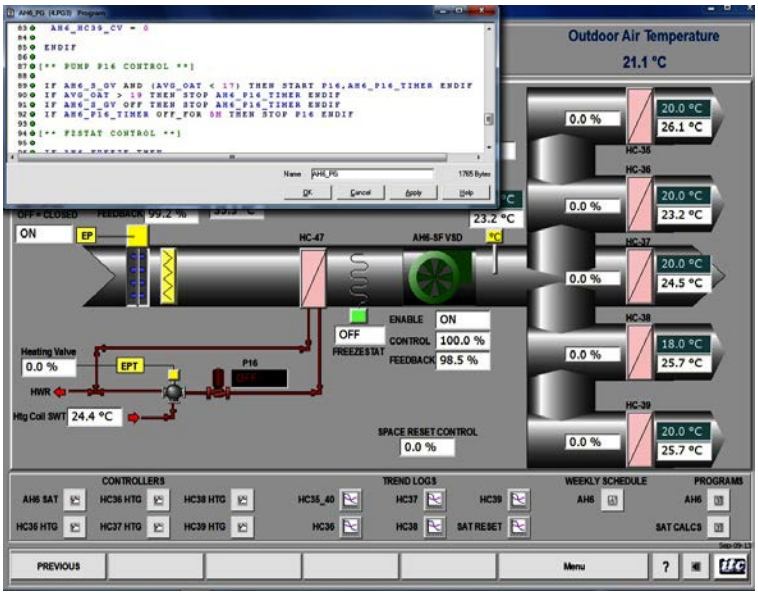
Parking Services promotes and supports Transportation Demand Management (TDM). This program is concerned with the ways in which Island Health's employees make optimal use of locally available transportation resources and Island Health supported initiatives, with a strong focus on getting people out of single-occupancy vehicles and into more efficient modes of commuting. Parking Services' primary focus is to reduce single-occupancy vehicle traffic and decrease the demand for parking at Island Health sites. Measures to support TDM include participation in the annual Bike to Work Week, offering employee enrollment in the BC Transit ProPass program, providing an inter-site shuttle between Royal Jubilee Hospital and Victoria General Hospital, and increasing total bicycle storage capacity. In the 2018/2019 fiscal year bike storage capacity increased by 2.63%.

Figure 4: Island Health's BC Transit ProPass Participation



Energy Wise Network Building Energy Challenge

Improving Building Performance Using DDC



I feel there is great value in this work and I support it 100%

Victor Noll
Regional Facilities Manager

Campaign Overview

The *Improving Building Performance Using Direct Digital Controls (DDC)* campaign launched in September 2018 and was aimed at engaging with building operators to identify energy saving opportunities from a controls perspective.

The campaign was launched shortly after one of our island wide energy education webinars. The webinar content helped form the basis of the Action Assessment survey.

The following actions were taken to promote the campaign:

- Securing endorsement from management/leadership
- Developing an Action Assessments to review on site
- Coordinating in-person site visits to conduct the assessment with FMO staff to support the review process

Learn more

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Building Energy Challenge

Results

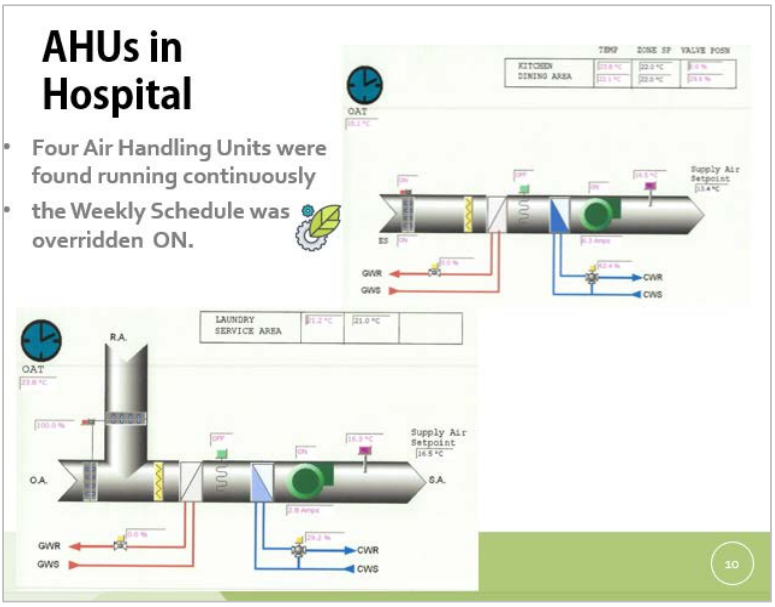
Background

Context

Island Health is committed to caring for patients and the environment. This means working together to reduce our carbon emission and improve efficiencies while delivering excellent care.

Goals

The Island Health Facilities Maintenance and Operations (FMO) staff plays an important role in finding energy conservation opportunities and were part of a number of campaigns focused on training and engaging FMO staff in ways to run their buildings more efficiently and supporting the organization's goal of reducing energy consumption and greenhouse gas emissions.



Results

Ten FMO staff from nine sites conducted the Action Assessments throughout the organization. Operators contributed to the success of the campaign by diving deeper into their own DDC programming, lending their experience on how systems run currently and how they can run better, and identifying inefficiencies in the programming that had, until now, gone unnoticed.

This campaign resulted in consolidated lists of controls upgrades, many of which were low cost/no cost measures, that were delivered to management groups to be considered for further action. In addition, staff were eager to collaborate, resulting in stronger relationships throughout our operations teams.

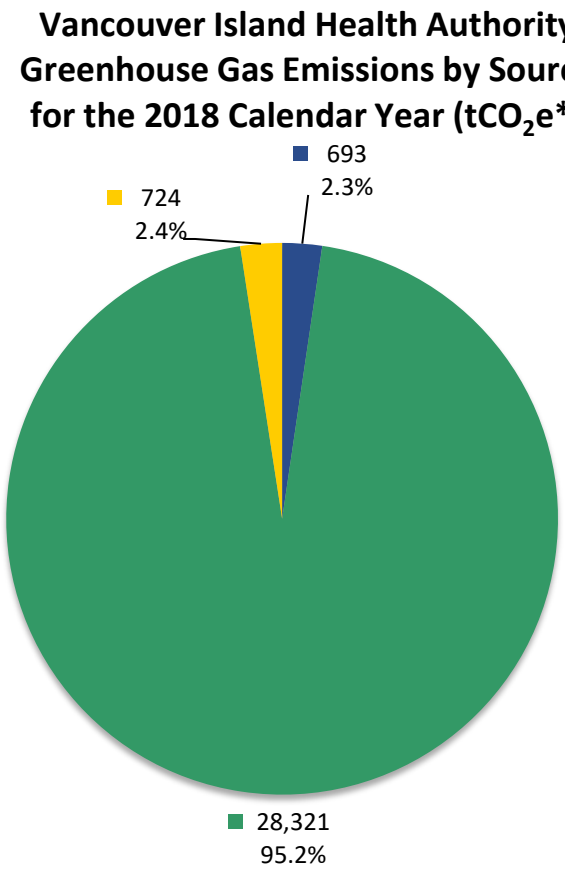
The Energy Wise Network was launched in 2016 to help organizations in their energy engagement programs.

The network is made up of Advanced Education, Government, Schools (K-12), Hospitality, Municipalities, Property Management, and Retail sectors.

We're working together to help B.C. save energy.

BC Hydro Power smart | FORTIS BC Energy at work

APPENDIX B: EMISSIONS SOURCE REPORT



Offsets Applied to Become Carbon Neutral in 2018 (Generated May 15, 2019 2:12 PM)

Total offsets required: **28,880**. Total offset investment: $**722,000**. Emissions which do not require offsets:

*Tonnes of carbon dioxide equivalent (tCO_2e) is a standard unit of measure in which all types of greenhouse gases are expressed based on their global warming potential relative to carbon dioxide.

** Under the *Carbon Neutral Government Regulation* of the *Greenhouse Gas Reduction Targets Act,* all emissions

APPENDIX C: 2018 CARBON NEUTRAL ACTION REPORT SURVEY

Part 1: CNAR Survey

General Information

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Organization Name: Vancouver Island Health Authority
Sector: Health
Role: Sustainability Coordinator Assistant

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?
The primary goal is natural gas reduction.

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)
Optimize building controls and existing systems.

II. Over the long term (6-10 years)
Initiate heat recovery projects and utilize alternate fuel sources.

c) Please describe your strategy's goals (if any) related to energy audits.
All facilities have had energy audits completed. Island Health is looking at more targeted audits, as there is not enough capital to follow through on the energy audit results.

I. What % on average of your building portfolio has an energy audit completed each year (if any)?:
10%

d) Please describe your strategy's goals (if any) related to building retrofits.
Island Health's strategy looks to leverage infrastructure renewal projects and ensure these projects have an energy lens.

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.)	5%
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.)	0%

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

Island Health has an ongoing program to verify building controls. The Energy Department conducts investigations looking for controls related opportunities, examines how buildings are operating, and tries to rectify control deficiencies.

I. What % on average of your building portfolio do you recommission each year?: 9%

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? N/A

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

g) How many newly constructed buildings received at least LEED Gold certification in 2018: 0

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

II. Please explain why LEED Gold certification was not obtained.

Island Health opened two new hospitals in 2017. They were designed to LEED Gold specifications and are awaiting certification.

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?

Yes

I. If yes, what are its goals?

10% reduction in fleet-wide annual fuel consumption, year-on-year.

Replace older vehicles with either ZEV or newer models with greater fuel efficiency.

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)

Reduce overall fuel consumption.

Replace 10% of light-duty vehicles with EVs annually.

Introduce two or more electric trucks for local delivery purposes.

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

Ensure more than 50% of fleet is electrified.

Ensure charging infrastructure is in place at all key sites for fleet vehicles.

c) How many fleet vehicles did you purchase from the following categories:

Electric Vehicle – EV - (e.g., Nissan Leaf, Chevy Bolt):	2
"Plug In" Electric Vehicle – PHEV (e.g., plug-in Prius, Chevy Volt):	0
Hybrid vehicle – HEV – non "Plug In"- (e.g., Toyota Highlander Hybrid):	2
Hydrogen fuel cell vehicle :	0
Natural gas/propane:	0
Gas/diesel vehicle:	22

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

Vehicles from other categories were not chosen due to lack of charging infrastructure, limited availability of EVs, and limited functionality of available EVs.

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

level 2:	5
level 3:	0
How many level 2 stations (if any) are specifically for your fleet vehicles:	1
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:	1
level 3:	0
How many level 2 stations (if any) were installed specifically for your fleet vehicles:	1
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.)

Island Health remains an on-ramp partner fleet of West Coast Electric Fleets, under the Pacific Coast Collaborative.

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)

Electric Vehicles – EV - (e.g., Nissan Leaf, Chevy Bolt):	2
"Plug In" Electric Vehicle – PHEV – (e.g., plug-in Prius, Chevy Volt) :	0
Hybrid vehicles–HEV–(e.g., non "Plug In"- older Toyota Prius, Toyota Camry hybrid):	2
Hydrogen fuel cell vehicles:	0
Natural gas/propane:	0
Gas/diesel:	67

b) Light duty trucks (LDTs)

Electric Vehicles – EV :	0
"Plug In" Electric Vehicle – PHEV:	0

Hybrid vehicles – HEV – (e.g., non "Plug In"- older Ford Escape Hybrid, older Chevrolet Silverado pickup hybrid etc.):	0
Hydrogen fuel cell vehicles:	0
Natural Gas/propane:	0
Gas/diesel:	80

c) Heavy duty vehicles (HDV)

Electric Vehicles – EV :	0
"Plug In" Electric Vehicle – PHEV :	0
Hybrid vehicles – HEV – (e.g., non "Plug In"):	0
Hydrogen fuel cell vehicles:	0
Natural Gas/propane:	0
Gas/diesel:	22

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

How much do you budget per LDV?:	$35,000
How many LDVs do you plan to procure annually over the next 5 years?:	20
How much do you budget per LDT?:	$45,000
How many LDTs do you plan to replace annually over the next 5 years?:	50
How much do you plan to spend per HDV?:	$155,000
How many HDVs do you plan to replace annually over the next 5 years?:	5

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?

Yes

I. If yes, what are its goals?

Reduce paper consumption.

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)

Utilize an alternative paper source.

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

Encourage the digitalization of operations to reduce paper consumption.

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

Yes

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

Yes

e) Other actions, please specify.

In 2018, Island Health began using paper created from the residue waste of sugar production.