

2016

Carbon Neutral Action Report



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Executive Summary

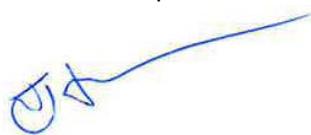
This is the seventh year that Island Health has reported its greenhouse gas emissions and become carbon neutral by purchasing offsets. Since first becoming carbon neutral in 2010, Island Health has developed a deep understanding of where our in-scope greenhouse gas emissions are derived, and expends considerable effort to reduce emissions as cost effectively as possible. This report discloses our emissions to offset for 2016, our emissions trends, and our strategies for reductions. Island Health remains committed to the provincial government's climate plans as outlined in the 2008 Climate Action Plan and the 2016 Climate Leadership Plan.

There are many competing interests for health care dollars. The challenge going forward is to achieve new emissions reductions and be able to find the capital necessary to meet our 2020 target of a 33% reduction below 2007 emissions. The Carbon Neutral Capital Program, established in 2014, has provided yearly funding to Island Health for minor projects that reduce emissions. Island Health has been able to use this funding strategically to reduce emissions, save operational dollars, and improve infrastructure. However, significant emissions reductions will require more funding going forward.

Facility renewal is a once-in-a-fifty-year opportunity to reduce emissions. Each new facility constructed at Island Health, starting with the Patient Care Centre in 2011, has been more energy efficient in emitting less greenhouse gas than its predecessor. The growing demand for health care services continues to drive expansions in service and facilities. It is our goal to continue the reduction of greenhouse gas emissions with the expansion of the health care system. This means that new facilities will have to meet far stricter emissions targets and be even more energy efficient than in the past. It also means that we will need to meet more of our energy needs with clean renewable energy.

A significant opportunity for emissions reduction is the replacement of large fossil-fuel boilers or heating equipment. Island Health has been exploring the opportunity to use biomass boilers for much needed boiler replacement. Biomass technology has been developed and utilized to provide safe, clean, high temperature thermal energy with a renewable fuel. Use of clean biomass from waste wood or forestry operations is the single-most impactful measure available to meet Island Health's 2020 emissions target. It also has the added benefit of keeping energy expenditures in the local community.

Global efforts to reduce greenhouse gas emissions have not been sufficient to avoid climate change. We are locked into certain change due to atmospheric warming that has already occurred. Island Health continues to monitor how climate change affects our existing facilities, and we will continue to plan for future climate change in the development of new facilities.

A handwritten signature in blue ink that reads "James Hanson". A blue line starts from the end of the "n" in "Hanson" and curves upwards and to the right, ending with a small circle.

James Hanson
Vice President
Operations and Support Services
Island Health

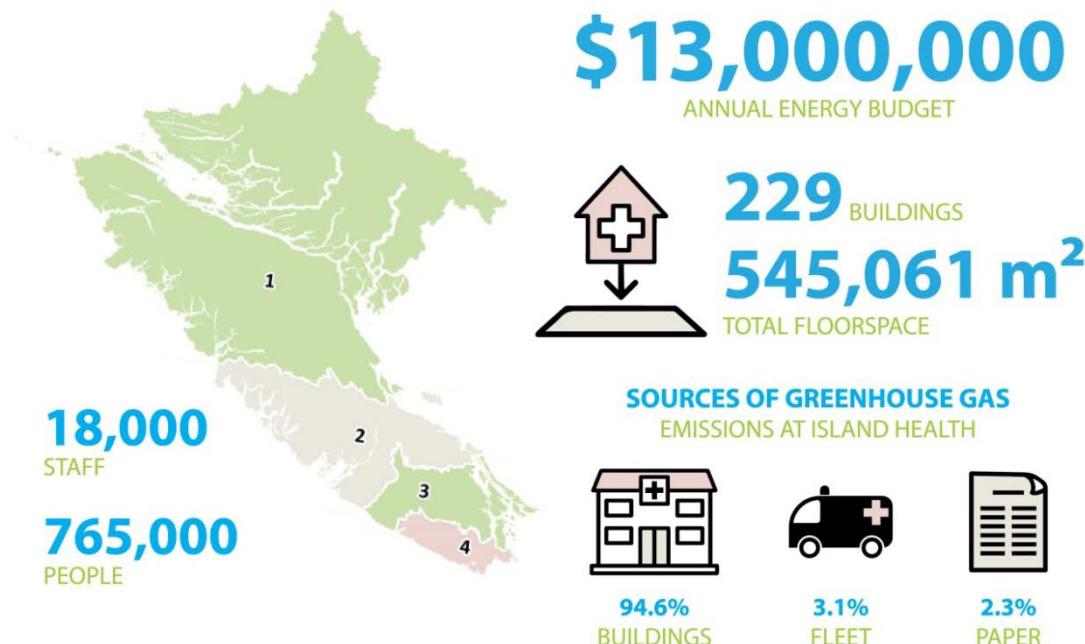
Overview

Island Health's 2016 Carbon Neutral Action Report for the period January 1, 2016 to December 31, 2016 summarizes our emissions profile, the total offsets to reach net-zero emissions, the actions we have taken in 2016 to reduce our greenhouse gas (GHG) emissions and our plans to continue reducing emissions in 2017 and beyond.

By June 30, 2017, a copy of this report will be posted on our website at:
http://www.viha.ca/about_viha/environment.htm

About Island Health

Over 18,000 health care professionals, technicians, and support staff at Island Health provide health care and support services to more than 765,000 people on Vancouver Island, the islands in the Salish Sea and the Johnstone Strait, and the mainland communities north of Powell River. Facilities are the largest source of greenhouse gas emissions for the health authority.



Commitment

Island Health's leadership is fully supportive of energy conservation and environmental sustainability. To that end, Island Health Executives and the Board of Directors are committed to achieving a 33% GHG emissions reduction below 2007 levels by 2020 and an 80% reduction by 2050. These targets are consistent with the BC greenhouse gas emissions target levels stated in the *Greenhouse Gas Reduction Targets Act*.

Since the B.C. Climate Action Plan was released in 2008, Island Health has been committed to becoming carbon-neutral and achieving the Leadership in Energy and Environmental Design (LEED) Gold standard in all new provincially owned or leased facilities. Island Health has since added three LEED Gold facilities: the Patient Care Centre in Victoria, Oceanside Health Centre in Parksville, and Nanaimo Regional General Hospital's (NRGH's) new Emergency Department. Both new North Island campuses in Campbell River and Comox are also built to meet LEED Gold standards.



Patient Care Centre in Victoria



Oceanside Health Centre



NRGH Emergency Department

Going forward, Island Health is committed to participating in the government's ongoing efforts to reduce emissions and adapt to changing climate. B.C.'s Climate Leadership Plan, released in August 2016, presents the next steps British Columbians will take to combat and live with climate change. For Public Sector Organizations (PSOs), the Plan requires the creation of 10-year mitigation and adaptation plans. While the Province is developing guidelines for PSOs to reduce emissions and plan for climate change adaptation, work is underway to prepare for the development of Island Health's 10-year climate change mitigation and adaptation plan.

In 2016, Island Health established the organization's first Environmental Sustainability Policy. It formally recognizes Island Health's commitment to achieving environmental sustainability through conservation of energy, resources, water and materials.

2016 Emissions and Offsets

Under the *Greenhouse Gas Reduction Targets Act*, Island Health as a public sector organization has been required to report and offset its emissions since 2010 to achieve carbon neutrality.

To reduce its emissions to net-zero, Island Health is required to enter into an agreement with the Ministry of Environment through which the Climate Action Secretariat will purchase and retire B.C.-based offsets on the organization's behalf. The offset payments provide incentives to B.C.-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. Island Health pays the invoice issued by the Ministry of Environment in an amount equal to \$25 per tonne of CO₂e offsets plus GST for each reporting year.

Table 1: Island Health's Total Emissions and Offsets for 2016

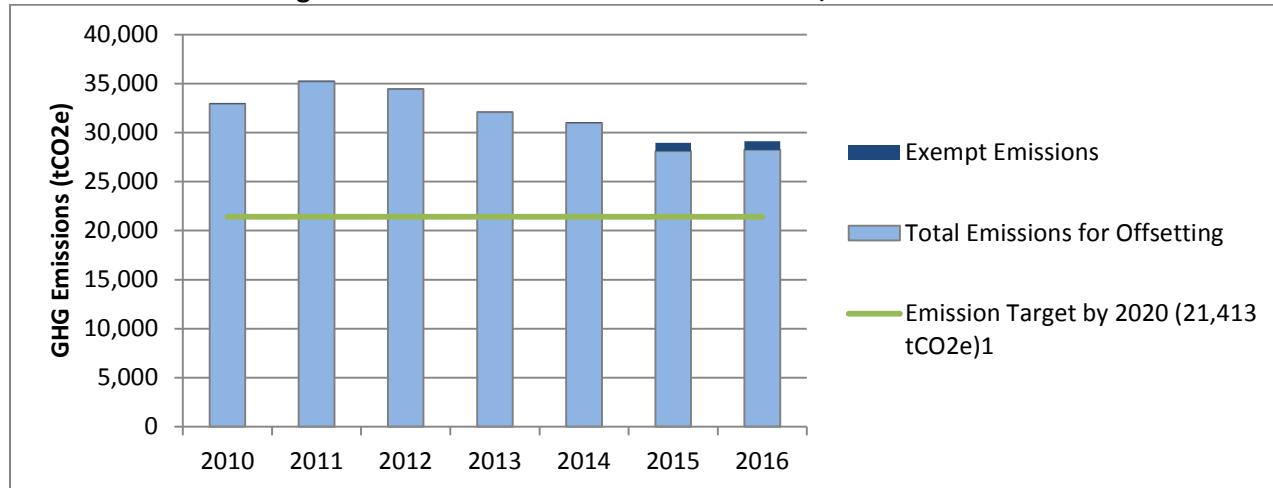
GHG Emissions created in Calendar Year 2016	
Total Emissions (tCO ₂ e)	29,110
Exempt Emissions (tCO ₂ e) ¹	870
Total Emissions for Offsetting (tCO ₂ e)	28,241
Adjustments to GHG Emissions Report in Prior Year	
Adjustments to 2015 Offsets	+76
Grand Total Offsets for the 2016 Reporting Year	
Grand Total Emissions for Offsetting (tCO ₂ e)	28,317
Total Offsets Cost (x \$25/tonne) x (5% GST)	\$743,321.25

¹ "Biogenic" portion (*BioCO₂*) of the emissions from biomass, renewable natural gas and biofuels are not required to be offset due to their renewable source.

Emission Trends

Island Health started offsetting emissions in 2010, and has been using the BC Government's SMARTTool program to report on GHG emissions. Figure 1 outlines the change in total emissions, exempt emissions and emissions for offsets from 2010 to 2016.

Figure 1: Island Health Emissions and Offsets, 2010 to 2016



¹ The emission target has been revised in 2016 based on the updated 2007 emissions.

Year	2007	2010	2011	2012	2013	2014	2015	2016
Total Emissions	31,960	32,993	35,279	34,470	32,123	31,050	28,957	29,110
Exempt Emissions	n/a	61	59	52	54	56	866	870
Total Emissions for Offsetting	n/a	32,938	35,226	34,423	32,075	30,994	28,091	28,241
Offsets Cost plus GST	n/a	\$822,835	\$875,250	\$859,125	\$841,260	\$813,068	\$737,310	\$743,321
Emissions per FTE ¹	2.66	2.70	2.85	2.67	2.49	2.38	2.05	1.99

Island Health's total emissions peaked in 2011 due to the addition of the Patient Care Centre in Victoria. Since then, emission levels have been decreasing at a rate between 2.3% and 6.8% annually. Total emissions level in 2016 is slightly higher (0.5%) than that in 2015. There are two main reasons for this:

- 1) The completion of a number of emission reduction projects in 2016 was delayed
- 2) The cold winter weather at the end of 2016 resulted in an increase in heating demand and thus higher gas consumption in many facilities.

The increases in exempt emissions in 2015 and 2016 are due to the purchase of renewable natural gas from FortisBC. As a result, the offsets Island Health needed to purchase were reduced.

¹ 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 healthcare sector's Carbon Neutral Action Reports.

Island Health has managed to decrease emission levels by 20% from the peak level in 2011. However, to achieve the emission target by 2020, the emission level needs to drop by another 20% in the next three years. Strategies to achieve the target are detailed in the Emission Reduction Activities section on Page 8.

Emissions from buildings make up close to 95% of total emissions. The rest comes from fleet and office paper. Emissions per Full Time Equivalent (FTE) have been steadily declining since 2011.

Table 2: Island Health Emissions by Source, 2010 to 2016

Emission Source [tCO ₂ e]	2010	2011	2012	2013	2014	2015	2016
Fleet	922	901	878	892	911	888	897
Office Paper	831	747	717	714	691	706	677
Buildings Owned & Leased	31,241	33,631	32,874	30,517	29,448	27,363	27,536
Total Emissions¹	32,994	35,279	34,469	32,123	31,050	28,957	29,110

¹ Total emissions include both exempt emissions and total emissions for offsetting.

Carbon Neutral Capital Program

In 2014, the Carbon Neutral Capital Program (CNCP) was expanded to include funding for B.C.'s health authorities. Since then, Island Health has been able to access capital funding to implement greenhouse gas emissions reduction projects. The average cost of reducing emissions through these projects is \$2,480 per tonne (Total Expenditure divided by Emission Reduction). This value is being used to project future emission reductions from CNCP funding only. The projection is presented on Page 10.

Table 3: Summary of CNCP Projects

Fiscal Year	Project Description	Total Expenditure (\$)	CNCP Funding (\$)	Total Annual Savings (\$)	Emission Reduction (tCO ₂ e/yr)
F2014/15	lighting upgrade boiler optimization HVAC zoning	1,296,278	902,818	194,452	507.5
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
F2016/17	Heat recovery chiller exhaust air heat recovery zone control domestic hot water decouple	1,354,402	817,953	104,640	630.6
	Average	1,374,986	849,759	157,244	554.4

Emission Reduction Projects in 2016

Heat recovery projects delivered the greatest emission reductions. West Coast General Hospital's Heat Recovery Chiller project has the largest single source emission reduction of 431 tCO₂e among all projects in 2016. More information about this project can be found in Appendix A.

The following table is a summary of various types of projects completed in 2016/17 fiscal year and their associated costs, savings, and emission reductions. The Incremental Cost per Tonne of GHG Avoided and Payback on Incremental Cost are calculated based on this information.

Table 4: Summary of Emission Reduction Projects in 2016/17 fiscal year

Project Type	Total Costs (\$)	Incremental Costs (\$)	Total Annual Cost Savings (\$)	GHGs Avoided (tCO ₂ e/yr)	Incremental Cost per Tonne of GHG Avoided (\$)	Payback on Incremental Cost (yrs)
Boiler & Heating Plant Upgrades	\$3,336,886	\$748,842	\$127,759	401.80	\$1,864	4
Lighting & Electrical Savings Projects	\$570,199	\$570,199	\$88,388	25.17	\$22,654	4
HVAC Conservation Measures	\$1,144,954	\$612,792	\$133,242	286.13	\$2,142	4
Energy Efficient Equipment	\$42,397	\$42,397	\$19,162	59.39	\$714	1
Heat Recovery Project	\$2,771,494	\$1,626,494	\$198,015	782.21	\$2,079	7
2016/2017 Total	\$7,865,930	\$3,600,724	\$566,565	1,554.69	n/a	n/a

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 to achieve a higher efficiency from the equipment being replaced, such as mid-efficiency boilers being replaced with high efficiency boilers. When an energy efficiency project is a new addition to the existing infrastructure, the incremental cost equals the total cost of the project, such as adding a new device to reduce unnecessary motor use.

Incremental Cost per Tonne of GHG Avoided is the incremental costs divided by GHG avoided. This measure indicates the cost of emission reductions by project type. It becomes apparent that an energy efficient equipment project such as dryer calibration is a very cost-effective measure to reduce emissions. Its limitations are in its impact and application. Heat recovery projects deliver the biggest impact but also come with a bigger scope and higher cost. Lighting upgrades show a high cost for emission reduction because hydroelectricity in BC is mostly renewable. However, given the higher electricity utility rates compared to current natural gas rates, such projects are necessary to reduce overall utility costs for the organization.

Payback is calculated by dividing incremental cost with annual cost savings. On average all project types have a payback of seven years or less, although the exact payback varies for each individual project.

Most of the measures have a life span of 15 to 20 years. Regardless of their emission reduction capacity, these projects generate significant cost savings and make a strong financial case for the investment on them.

Strategies for Future Emissions Reduction

Figures 2 and 3 below show GHG emissions and energy by fuel type respectively. 97% of Island Health's building-related GHG emissions come from fossil fuel, 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.

Figure 2: GHG Emissions by Fuel Type

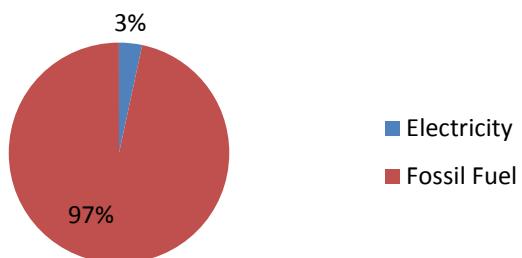
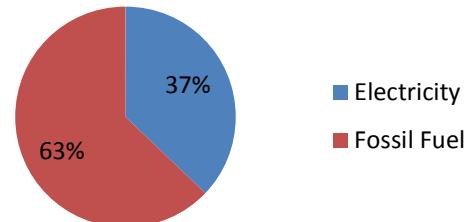


Figure 3: Energy by Fuel Type



Existing Buildings

In existing buildings, opportunities are available to minimize waste and improve efficiency. Minimizing waste could mean changing energy-wasteful behaviors, eliminating unnecessary runtime or motors or lights (e.g. idling, standing-by), or improving a building envelope's thermal performance to reduce the need for heating or cooling. Efficiency can be improved through various measures such as lighting upgrades, heat recovery, boiler replacement and heating ventilation & air conditioning (HVAC) system zone controls.

New Construction

New construction projects could represent a net increase of the organization's total GHG emissions, as evidenced by the addition of the Patient Care Centre in Victoria in 2011. Setting aggressive energy and emission targets at the early stages of project conception ensures Island Health will be on track to meet its emissions target. As demonstrated by the two North Island Hospital campuses that are projected to lower emissions by 73%, it is possible to find innovative solutions to realize significant emissions reduction while meeting other project requirements.

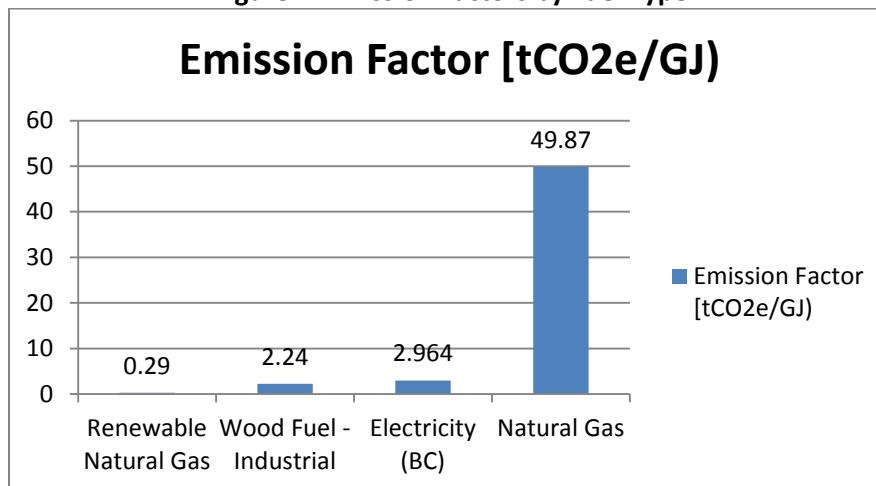
The BC Building Code has been revised to include an Energy Step Code - an optional stepped approach to achieving the requirement that all new construction be net-zero ready by 2032. It should be noted that PSOs will be expected to lead these initiatives. Island Health is already exploring new methods, such as the Passive House standard², to design and construct net-zero ready facilities. In order to achieve such a high performance standard in a cost- effective manner, it becomes necessary to take an 'envelope first' approach which reduces overall loads and creates a greater buffer against fluctuating outdoor temperatures. The investment in building envelope performance will improve occupants' comfort year round and minimize the impact of extreme weather conditions on fuel consumption.

² The international Passive House standard is one of the most rigorous and advanced building performance standards in the world, achieving reductions in heating energy of up to 90 per cent compared to other buildings.

Energy Source Management

Another important strategy to reduce future GHG emissions is to increase the share of low-carbon energy sources. On this front, Island Health has taken steps to install renewable energy systems, purchase renewable natural gas and assess the feasibility of a biomass energy plant at NRGH and Cairnsmore Place Residential Care.

Figure 4: Emission Factors by Fuel Type



Solar hot water systems have been installed at four facilities: Victoria General Hospital, Aberdeen Hospital, Saanich Peninsula Hospital and Cairnsmore Place. In total, they produce between 715GJ to 850 GJ of energy per year. In the spring of 2016, West Coast General Hospital in Port Alberni installed 407 solar photovoltaic (PV) panels – the largest solar electric array on Vancouver Island. It is estimated that this system will generate 134,026 kWh of energy per year. Although the energy generated from these renewable energy systems is currently less than 1% of the total energy use of the organization, they do provide many benefits such as reducing loads, lowering demand charges, and demonstrating leadership in adopting clean technologies.

A biomass energy plant uses clean wood that is sourced from the waste stream of construction, manufacturing, forestry and sawmill industries. This fuel can be sourced locally to provide thermal energy in the form of hot water or steam. The use of a biomass energy plant at NRGH, the second biggest emitter at Island Health, could significantly reduce the reliance on natural gas. Thermal energy generation from biomass is considered a proven technology and has helped other organizations such as the University of British Columbia reduce their emissions. Its potential impact on Island Health's GHG emissions is illustrated by the green line in Figure 5. This single measure will effectively allow Island Health achieve its 2020 emission target. The blue "business as usual" line represents the expected emissions reduction resulting from a steady investment of Carbon Neutral Capital and the average cost for one tonne of emissions reductions being \$2,480 per tonne of CO₂e.

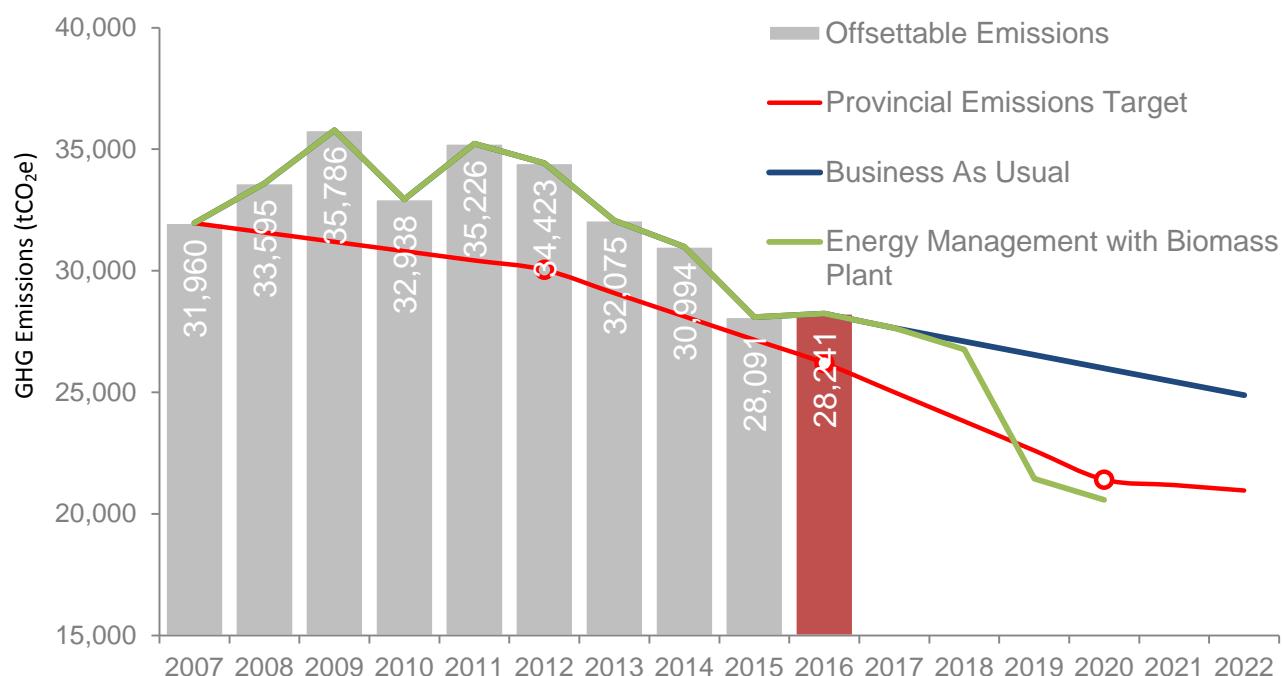
Fleet

Emissions from fleet represent 3.1% of the total emissions in 2016. The main strategy to date for managing fleet emissions is to improve fuel efficiency of vehicles and to consider zero-emission vehicles that are compatible with fleet vehicle uses, when new vehicles are purchased.

Paper

Emissions from paper represent 2.3% of the total emissions in 2016. The biggest opportunity for paper emission reduction is to use less paper through digitalization and changing procedures and behaviors. The use of alternative paper types such as wheat, eucalyptus, sugarcane, bamboo, could lower the reported emissions of paper as well. The Ministry of Environment currently assumes these papers have the same emission factors as 100% post-consumer recycled content paper in the absence of supporting literature. Testing the performance of these alternative paper types is required to see how the papers perform in printing and copying devices. Island Health has also requested Environmental Product Declaration information from paper suppliers but has found that this information is, in general, not currently available.

Figure 5: Island Health Emissions, Targets and Projections



Climate Adaptation

Changing climate has been identified as a potential risk to operations and infrastructure. Healthcare has a responsibility to adapt and will need to look at existing policies, procedures, and infrastructure to assess what needs to be changed immediately, and in the near future as buildings or systems are refreshed or replaced. There are many tools to help with this assessment including the Health Care Facility Climate Change Resiliency Toolkit supplied by the Canadian Coalition for Green Health Care and the Public Infrastructure Engineering Vulnerability Committee (PIEVC) Risk Assessment Protocol produced by Engineers Canada.

PIEVC provides a structured and rigorous approach to identifying vulnerabilities and effective approaches to improving resiliency, through changes in operation, maintenance, and design of a facility. It has been used by municipalities, universities and transportation authorities. Island Health has partnered with Engineers Canada and Natural Resources Canada to conduct the first Climate Vulnerability Assessment of a health care facility at NRGH using this protocol.

Sustainability Initiatives

Many departments in Island Health are actively taking measures to achieve greater efficiency and reduce consumption of resources. Below are highlights of these activities in 2016.

Device Management

The Device Services area within Information Management & Information Technology (IMIT) Department has been raising their carbon footprint reduction targets by about 5-10% annually (sometimes higher) to continually challenge themselves. Printing devices are being refreshed with more energy efficient equipment. A total of 853 old printers have been replaced with new ones that are 5% to 47% more energy efficient. Organizationally, the desktop footprint has been reduced from approximately 75% to 64%. Device mobility has been increased from 25% to 36%. Given that laptops typically consume less energy than desktop computers, the transition also yields energy savings. Through duplexing and digital scanning, Island Health saved 12.6 million sheets of paper over the last twelve months.

Linen Utilization

Environmental Support Services has been actively managing how and when linens are used. In the 2015/16 fiscal year, South Island Regional Laundry achieved a 4% reduction in linen consumption despite a 3% increase in patient days. For 2016/17, another 2% reduction in linen consumption was recorded with a 2.5% increase in patient days. In other words, less linen is used even though the service demand is higher.

Behavior Change

The 2016 Green Survey monitored Island Health employees' participation and attitude towards environmental sustainability activities. Of 2,253 respondents, 93% reported that they recycle and 85% reported that they turn lights off on a regular basis. Highlights of the survey results are included in Appendix B.

The Energy Efficiency and Conservation (EEC) Department delivered twenty nine Greening Care Tours in 2016. The team presented these 15-minute interactive sessions on climate change and sustainability directly to the staff in twenty five departments at four major hospitals.



Greening Care participants at Victoria General Hospital

Island Health's Green Champions continue to show leadership and make a difference in their own departments. The 2016 Turn –It-Off Campaign achieved an average improvement of 24% for turning lights and monitors off.

Food Services

A new food service model for many Island Health facilities offers a choice menu where the patients get a chance to select what they want to eat, thus reducing food waste. At the North Island Hospital Campuses in Campbell River and Comox, new machines were installed in the kitchen that turn food waste and paper into compost which could be used in gardens.

Anesthetic Gases

Inhaled anesthetics, as a group, are recognized greenhouse gases that have significant global warming potential (GWP). Biomedical Engineering purchased new anesthesia units that have better controls to manage anesthetic gasses and extent of fresh gas flow. Sixty-three units were installed – one per operating room at all sites that provide surgery service. This not only resulted in better patient outcomes but also reduced anesthetic gas use by 30% over the last two years.

Appendix A: Success Story

Leveraging Infrastructure Renewal to Lower GHG Emissions

Island Health's Energy Manager turned an infrastructure renewal project into an opportunity for energy savings and GHG reduction when it came time for West Coast General Hospital (WCGH) in Port Alberni to replace its 15-year-old air conditioning system.

An experienced consulting engineer was hired to examine alternatives to renewing the system, with the goal of replacing the hospital's rooftop air cooled chiller with a system that could also provide heating and offset natural gas consumption.

Chillers function much like a home refrigerator. Using what's known as a vapour-compression cycle, they extract energy (heat) from one location (inside your fridge) and relocate it to another (outside your fridge). Several chiller designs and configurations are available on the market, many of which can simultaneously provide cooling and various levels of useful heating.

At WCGH, the aging chiller simply dumped its heat into the air outside. Energy that could have been used inside the building for domestic hot water or other purposes was lost to the atmosphere. Island Health needed an improved system that would put this energy to use.

A total of five different chiller designs and configurations were evaluated to determine the added cost and benefits of each option, in comparison to the "base case" of a new roof top air cooled chiller with no extra benefits. The analysis provided estimates of the marginal costs associated with each option, as well as the expected changes in electricity and natural gas consumption for the site. In most of the cases, electrical energy consumption was higher than for the base case but natural gas much lower.

The option that provided the greatest overall reduction in energy costs and GHG emissions was a water-cooled heat pump, now installed at WCGH. This machine produces both chilled water and hot water simultaneously, diverting each to where it's needed throughout the hospital. In the winter, when heating is needed the most, chilled water is diverted to the building exhaust air stream where it harvests heat, brings it back to the heat pump and transfers it to the hot water side. It is then pumped to supply air systems to warm incoming air to the hospital and to the potable water system to make domestic hot water.

This approach has been used in several new hospitals in BC and is becoming recognized as a viable energy-saving retrofit to existing hospitals. Using heat recovered from building exhaust to heat incoming fresh air means much less natural gas has to be burned in the boiler plant.

This results in substantially reduced GHG emissions. This project provides a win-win by ensuring WCGH's air conditioning system remains reliable and substantially lowers the site's GHG emissions.

Quick Facts:

- Total project budget: \$2.017 million
- Incremental Cost: \$872,000
- CNCP funding: \$367,551
- Cost savings: \$63,850/year
- Annual GHG reductions: 431 tCO₂e or 35% (total annual emissions =1,250 tCO₂e before the project)
- Technology: water-cooled heat pump utilizing building exhaust air as the source of thermal energy

Figure 1. Multistack heat recovery chiller (one module)



Appendix B: Island Health Green Survey Infographic



2016 Island Health Green Survey Results

The 2016 Green Survey was completed by 2,253 Island Health employees and physicians. In 2016, Island Health emitted slightly more Greenhouse Gases (GHG) than in 2015, partly due to the unusual weather at the end of the year. To reach the organization's Greenhouse Gas emission reduction target, we need to reduce our current emissions by 25% by 2020. Please help shrink our environmental footprint. You can make a difference by traveling more efficiently and by looking for ways to reduce energy, water, waste, and other resources. Together we can do this!

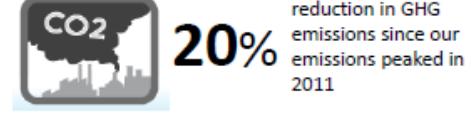
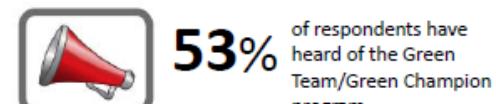
Employees' Sustainability Values



Opportunities for Action



Sustainability Facts



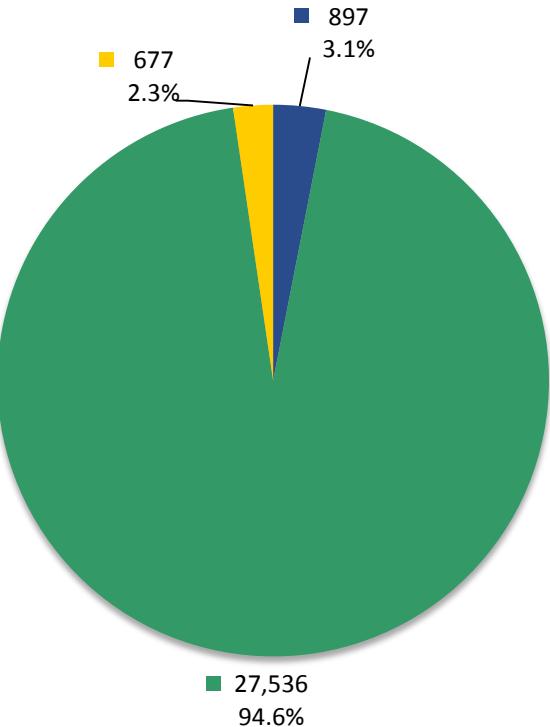
Learn more: intranet.viha.ca/green

Green Team



Appendix C: Emissions Source Report and 2016 Carbon Neutral Action Report Survey

Vancouver Island Health Authority Greenhouse Gas Emissions by Source for the 2016 Calendar Year (tCO₂e*)



Total Emissions: 29,110

- Mobile Fuel Combustion (Fleet and other mobile equipment)
- Stationary Fuel Combustion (Building Heating and Generators) and Electricity
- Supplies (Paper)

Offsets Applied to Become Carbon Neutral in 2016 (Generated June 05, 2017 12:09 PM)

Total offsets required: **28,241**. Total offset investment: **\$706,025**. Emissions which do not require offsets:

*Tonnes of carbon dioxide equivalent (tCO₂e) 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

2016 Carbon Neutral Action Report Survey

Part One

Organization Name:

Vancouver Island Health Authority

Please select your sector:

- Health Authority or Affiliate

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

During 2016, did your organization take any of the following actions to support emissions reductions from buildings?

Select all that apply

- Conducted an energy audit/study of building(s) in the organization's portfolio
- Performed energy retrofits of the organization's buildings.: 11
- Built, or are building new LEED Gold or other "Green" buildings.: 5
- Other actions? Please describe briefly.: Greening Care Employee Engagement Program that promotes energy and carbon emission reductions through behavior change

Briefly describe your organization's plans to continue reducing emissions from its stationary sources in future years.

Island Health will look for emission reduction opportunities through the following types of projects:

1. HVAC zoning
2. Continuous optimization of HVAC systems
3. Heat recovery projects
4. Boiler replacement
5. Building envelope improvement
6. Process demand management

7. Switching to lower emissions energy source

During 2016, did your organization participate in utility-sponsored energy demand management program(s) (e.g. BC Hydro's Energy Management (Manager))?

Yes

If yes, please describe briefly:

We have two BC Hydro supported energy managers and three FortisBC sponsored energy specialists. The combined effort resulted in booking 1,500,000 kWh/year electrical savings and 21,055 GJ/year natural gas savings.

2) Mobile Sources (Vehicles, Off-road/Portable Equipment): Fuel Combustion.

During 2016, did your organization take any of the following actions to support emission reductions from its mobile sources?

Select all that apply

- Replaced existing vehicles with more fuel efficient vehicles (gas/diesel).: 7 existing vehicles were replaced with newer, more efficient ones

Briefly describe your organization's plans to continue reducing emissions from its mobile sources in future years.

Island Health plans to assess the suitability of electric vehicles to replace some of fleet vehicles in the future.

3) Supplies (Paper):

During 2016, did your organization take any of the following actions to support emissions reductions from paper supplies?

Select all that apply

- Awareness campaign focused on reducing office paper use.
- Other actions? Please describe briefly.: 30% recycled paper is set as the 'default' option. Wheat paper was trialed at one of our residential care facilities. Preliminary testing of sugar paper has been completed. At this time agri-paper needs to be tested to see if the papers work with printers and

copiers. Further information from the suppliers is needed to evaluate the sustainability and actual emission reductions of these papers.

Briefly describe your organization's plans to continue reducing emissions associated with its office paper use in future years.

Work with paper-intensive units and identify behavior or procedure change opportunities to reduce paper use.

4) Other Sustainability Actions:

Business Travel:During 2016, did your organization take any of the following actions to support emissions reductions from business travel?

Select all that apply

- Encouraged alternative travel for business (e.g. bicycles, public transit, walking)
- Encouraged or allowed teleworking or working from home

Education & Awareness:During 2016, did your organization have any of the following programs or initiatives to support sustainability education and awareness?

Select all that apply

- Green, Sustainability or Climate Action Team
- Support for professional development on sustainability (e.g. workshops, conferences, training)
- Supported or provided education to staff about the science of climate change, conservation of water, energy and/or raw materials

Other Sustainability Actions:During 2016, did your organization have any of the following programs or initiatives to support sustainability?

Select all that apply

- A water conservation strategy which may include a plan or policy for replacing water fixtures with efficient models
- An operations policy or program to facilitate the reduction and diversion of building occupant waste (e.g., composting, collection of plastics, batteries) from landfills or incineration facilities
- Lifecycle costing of new construction or renovations

Part Two

Out of all the projects your organization has undertaken in 2016, please select the one action that resulted in, or is expected to result in, the greatest emissions reductions (this may be considered your "success story"):

The implementation of the West Coast General Hospital's heat recovery chiller project is expected to reduce 431 tCO₂e per year.

What are the barriers your organization faces when trying to implement emissions reduction initiatives? It is expected that funding is a major issue. If there are other barriers as well please briefly describe those below:

The way capital projects are prioritized within Island Health generally favors projects that directly connects to health outcome and patient service.

What projects ("opportunities") does your organization see as being most effective in leading to substantive: a) Reductions of emissions, increased energy efficiency; and b) Adaptation/strengthened resilience to climate change?

Please describe briefly

- a) Implement our strategic energy management plan and use alternate forms of energy such as biomass; Design new buildings with aggressive energy targets.
- b) Develop an adaptation plan, conduct site-specific assessments, and continue with stakeholder and organizational engagement.

Does your organization have an emission reduction target?

Yes

If Yes, please describe briefly:

33% below 2007 emission level by 2020

Does your organization have a strategic emission reduction plan to reduce the organization's emissions?

(e.g. a long term plan)

Yes

If Yes, please describe briefly:

Island Health has a 5-year Strategic Energy Management Plan that is updated annually. The plan includes strategies to have Island Health achieve its 2020 emissions reduction target. Work is underway to develop a 10-year plan.

Does your organization use an energy management system?

Yes

If Yes, please describe briefly:

Island Health Energy Efficiency and Conservation Department uses Strategic Energy Management Plan, a master energy project list, measurement and verifications, and direct engagement with facility staff to complete the plan-do-check-act process.

Does your organization use building energy management tools?

Select all that apply

- ENERGY STAR Portfolio Manager
- PUMA

Does your organization use an environmental management system to track and manage the organization's environmental impacts (e.g., beyond energy to include water, waste, contaminated sites, etc.)?

No

If Yes, please describe briefly:

(No response)

Does your organization have a strategic adaptation plan to improve the resilience of the organization's infrastructure and services to the effects of climate change (e.g. Conduct a climate risk assessment for your facilities and services; prioritize risks to prepare for/respond to)?

No

If Yes, please describe briefly:

(No response)

Has your organization consulted any of the following resources on climate change adaptation?

Select all that apply

- Plan2Adapt, a tool to explore the impacts of climate change on British Columbia
- Canadian Coalition for Green Healthcare Climate Change Resilience Toolkit
- The Public Infrastructure and Engineering Vulnerability Committee's (PIEVC) protocol

Has your organization considered or assessed whether increased frequency of extreme weather events and/or long term changes in climate will affect your organization's infrastructure, its employees and/or its clients?

Yes

Has your organization taken actions/projects to respond to any impacts cause by the above?

Yes

If Yes, please describe briefly:

Island Health initiated a PIEVC study on the Nanaimo Regional General Hospital. For large infrastructure replacements or new building construction, there is a conversation with the designers to consider climate change in their design primarily in terms of increasing demand for cooling.

Has your organization incorporated anticipated changes in climate into your organization's planning and decision making?

No

If Yes, please describe briefly:

(No response)

Other Adaptation Planning related activities/programs (please describe briefly):

Island Health participated the Pacific Northwest Climate Resilient Healthcare Workshop held in Seattle on Dec 7th, 2017.

Stationary Sources Data: What is the total amount of floor space in your organization (including occupied and unoccupied space)?

545,061 square meters

Full Time Employee Equivalent Data (Except Health Authorities and affiliates): How many full time equivalent employees (FTEs) do you have within your organization?

14,214

Mobile Sources Data: Please indicate the number of the vehicles in the following vehicle classes that are in your fleet:

Variable	Response
Mobile Sources Data: Please indicate the number of the vehicles in the following vehicle classes that are in your fleet: Light duty vehicles (e.g. cars)	46
Mobile Sources Data :Please indicate the number of the vehicles in the following vehicle classes that are in your fleet: Light duty trucks (e.g. trucks, SUVs, Mini Vans)	110
Mobile Sources Data: Please indicate the number of the vehicles in the following vehicle classes that are in your fleet: Heavy duty vehicles (e.g. transport trucks)	6
Mobile Sources Data: Please indicate the number of the vehicles in the following vehicle classes that are in your fleet: Off road vehicles (e.g. forklifts, front end loaders, snowmobiles)	11
Mobile Sources Data: Please indicate the number of the vehicles in the following vehicle classes that are in your fleet: School/transit buses: School Districts, Post-Secondary and BC Transit ONLY	19