



Image: Oceanside Health Clinic in Parksville, the most energy efficient site within Island Health [excluding the Office & Outpatient facility type]]

Strategic Energy Management Plan

Vancouver Island Health Authority - 2021



Energy Department

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Land Acknowledgement

We respectfully acknowledge the ɫə́kwəŋən (Lekwungen) speaking peoples of the Songhees and Esquimalt Nations, and other Coast Salish Nations on whose traditional lands we are thankful to work, live, and enjoy. We recognize the importance of the spiritual, emotional, physical, and mental connection First Nations' people have to the land.

We understand the lands and ecosystems within these territories are being adversely impacted by climate change and our team commits to reducing this impact by minimizing VIHA's energy use and carbon emissions and being more thoughtful in our use of all natural resources including water.



Executive Summary

In 2020/2021 (F2021), the Energy Department continued to focus on an alignment with Island Health’s new strategic framework. The Strategic Energy Management Plan (SEMP) is used to communicate these goals to both internal and external stakeholders.

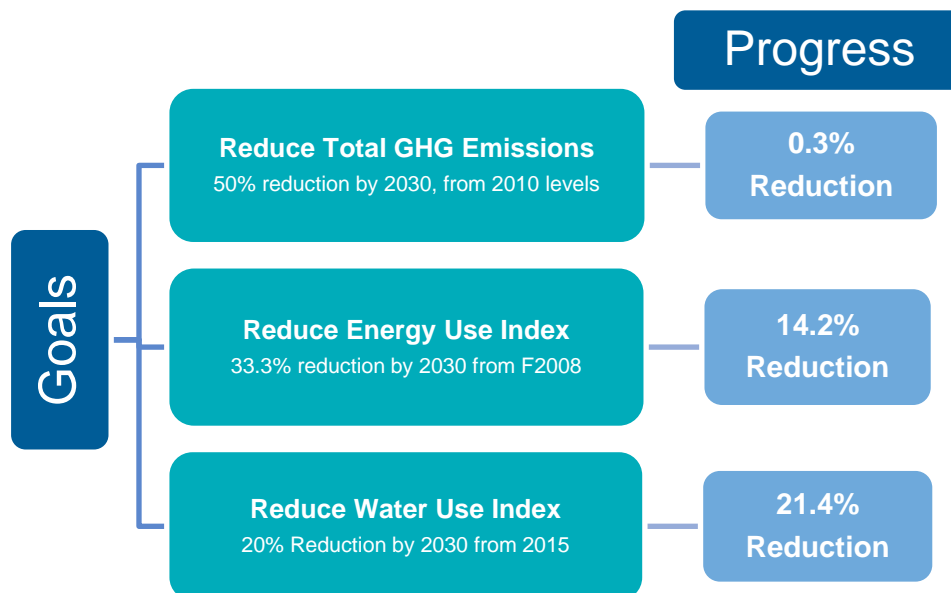
Increase Health System Value and Ensure the Sustainability of Health and Care Services

(Island Health’s Strategic Framework Goal #3)

“We will advance environmental stewardship best practices in our buildings, services, processes and culture to ensure our environmental foot print is minimized”

(Objective #3)

The Energy Department is supported by BC Hydro and FortisBC through numerous incentive funding agreements. Within these agreements there are project-based energy reduction targets that are required to be met. These targets are integrated into the strategic goals in a manner which helps strengthen the overall plan. The goals are intended to enhance facility performance and effectively improve energy and carbon efficiency.



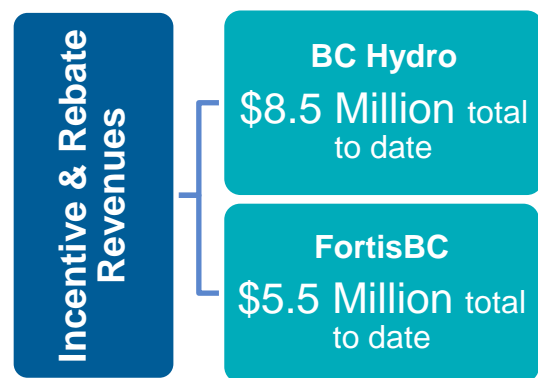
The Energy Department’s primary goal is to reduce greenhouse gas (GHG) emissions so as to minimize Island Health’s contribution to climate change, while also driving down the Energy Use Index (EUI) and Water Use Index (WUI) of Island Health’s facilities to minimize operating costs. A significant component of reducing GHG emissions is to permanently reduce natural gas and electricity use, which is also mandated through FortisBC and BC Hydro contracts.

Progress to Date?

Overall, meaningful progress towards achieving the goals has been made. The EUI and WUI results are particularly encouraging when one considers the continued increase in service levels and use of energy intensive technology (i.e. medical imaging equipment), limited capital funds for infrastructure renewal and retrofit projects, and utility rate escalation. These pressures all challenge the Energy Department’s ability to reach these goals and targets.

The reductions in EUI and WUI achieved has mitigated the financial impact of these pressures; however, the challenges remain particularly great in terms of GHG emissions reduction. More aggressive action to achieve the stated target is required. **Progress towards the 2030 target currently falls well short** of where it needs to be, in part due to the recent increase in electricity emission intensity factor, effective in 2021, and retroactive to 2010.

Based on energy savings recognized by BC Hydro and FortisBC (defined as “booked” savings) through their programs, since the energy management program started in F2008, the Department has implemented projects that result in the cumulative effect of avoiding more than 27,343,000 kWh of electricity use and 151,200 GJ of natural gas consumption annually. At today’s rates, that’s worth \$4,002,000 in avoided costs. To put that into perspective, Island Health currently spends more than \$15,000,000 on electricity and natural gas; without the program that total would be close to \$20,000,000.



Partnerships with BC Hydro and FortisBC continued to be foundational to the Energy Department’s program; the breadth and value of incentive programs have increased recently, providing even more financial support on numerous projects, programs, and initiatives. Since 2008, Island Health has received more than \$13 million in funding support for energy related initiatives, as shown in the adjacent diagram.

What Now?

The SEMP details a plan to achieve progress towards the 2030 targets, however, on GHG emissions, it falls short. To implement this plan, additional investments are required into building systems optimization, energy efficiency, electrification and deep retrofits.

Continuing to identify, develop and execute on sufficient cost-effective projects, defined in part as the capital cost of annual emissions reduction in \$/tCO₂e, is a key barrier to meeting the annual emissions reduction target of 1,682 tCO₂e/year which would achieve the 50% reduction by 2030. The current process of using end-of-life replacements as the primary project pipeline will only achieve a portion of the goals. Therefore, an energy guideline is being prepared to prescribe various solutions to maximize the GHG reduction potential of all projects where energy and emissions are impacted. In addition, the Energy Department is planning to engage a qualified consulting firm that will assist in the preparation of a long-term detailed project-based plan for how to achieve the 50% reduction in emissions.

The Energy Department has developed a master project list (MPL) to keep track of and prioritize existing projects and with this has created the Multi-Year Plan (MYP). Based on projects selected in the MYP, the current expected results in the next three years are as shown below, pending approval of capital in years two and three. As shown, the current plan doesn't achieve the required 1,682 tCO₂e reduction.

Multi-Year Plan Key Metrics					
Goals	Annual Reduction Target	Year 1 2021/22	Year 2 2022/23	Year 3 2023/24	3-Year Average
GHG Emissions (tCO ₂ e/year)	1,682	1,233	1007	474	904
Energy Use Index (EUI) (kWh/m ² /year)	9.6	13.5	12.3	7.4	11.1
Water Use Index (WUI) (m ³ /m ² /year)	0.02	0.02	0.02	0.02	0.02
BC Hydro Booked Electricity Savings (MWh/year)	1,200	1,526	124	240	630
FortisBC Booked Natural Gas Savings (GJ/year)	16,000	18,222	10,331	7,513	12,022
Investment Required (Incremental Capital Cost)		\$2.04m	\$6.64m	\$3.61m	\$4.09m
Incremental Capital Cost (\$/tCO ₂ e)		\$1,661	\$6,595	\$7,613	\$5,290

These goals are set using the SMART (specific, measureable, achievable, realistic, time-bound) methodology, and **while attainable, will not be achieved without operational changes and additional capital funding**. The table above summarizes the incremental capital cost of projects in each year of the Multi-Year Plan as well as the predicted cost of GHG reduction from that investment. In addition to the energy and environmental goals, this SEMP contributes in other more intangible ways, such as facilitating actions that will lead to improved occupant comfort, reduced maintenance costs, improved infrastructure reliability, and resiliency to changes in the climate.

The Energy Department continues to work diligently towards the goals and targets outlined within this SEMP with external stakeholders in government and utilities, and numerous internal stakeholders that include Facilities Maintenance and Operations (FMO), the Facilities Capital Development (FCD), the Capital Planning & Finance Departments, and Sustainability and Business Continuity. Throughout the critical timeline of 2008 – 2030, much progress has been made in energy and water efficiencies, as exemplified by the EUI and WUI metrics, however, it remains an ongoing and significant challenge to reduce organizational carbon emissions as the portfolio of facilities continues to expand while limits on capital and maintenance budgets remain. It is evident that the business-as-usual approach to energy management will not be sufficient to meet the 50% reduction in carbon emissions target as we approach 2030. Significant

investments in low-carbon systems and equipment are central to a rapid decarbonization of Island Health, in which innovative financial, behavioural, and technical mechanisms must be further adopted and supported in the pursuit of carbon reduction goals.

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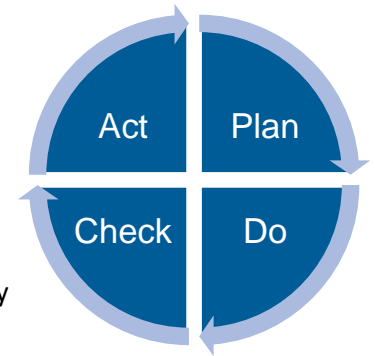
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1. Purpose

This Strategic Energy Management Plan (SEMP¹) is Island Health's business plan for reducing greenhouse gas (GHG) emissions, energy consumption, water usage and utility costs. The SEMP:

- Sets objectives and targets (Plan)
- Provides a realistic plan for achieving them (Do)
- Tracks performance indicators to measure progress (Check)
- Identifies opportunities and areas for improvement (Act)
- Continually improves the process of all the actions listed above

The SEMP is reviewed quarterly, revealing if targets are being met. If not, the Energy Department works with stakeholders to adjust the plan.



¹ The SEMP includes the Energy Department's **EEC Master Project List** Excel file.

2. Organizational Summary

- 48 Owned Sites
- 23,000+ staff
- 540,551m² of floorspace
- \$13,774,854 spent on energy in F2021
- \$1,923,075 spent on water in 2020
- 33,742 tCO₂e emitted in 2020

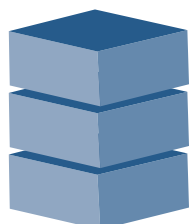
Key Performance Indicators & Targets

Progress towards stated goals is monitored and tracked using key performance indicators (KPI) which provide an indication as to how much progress has been successfully made. There are five main KPIs tracked in order to assess the success of the Strategic Energy Management Plan, and the associated goals and targets, as follows:

KPIs				
Total GHG Emissions (tCO ₂ e/year)	Energy Use Index (kWh/m ² /year)	Water Use Index (m ³ /m ² /year)	Booked Electrical Savings (kWh/year)	Booked Natural Gas Savings (GJ/year)
Targets				
50% reduction by 2030 from 2010 levels	33.3% reduction by 2030 from 2008 levels	20% Reduction by 2030 from 2015 levels	1,200,000 kWh/year	16,000 GJ/year

Organizational Alignment

Island Health's five year (2020 - 2025) strategic framework provides a road map for the organization that prominently includes the following commitment:



To Increase Health System Value and Ensure the Sustainability of Health and Care Services (Island Health's Strategic Framework Goal #3)

Objective #3: "We will advance environmental stewardship best practices in our buildings, services, processes and culture to ensure our environmental footprint is minimized"

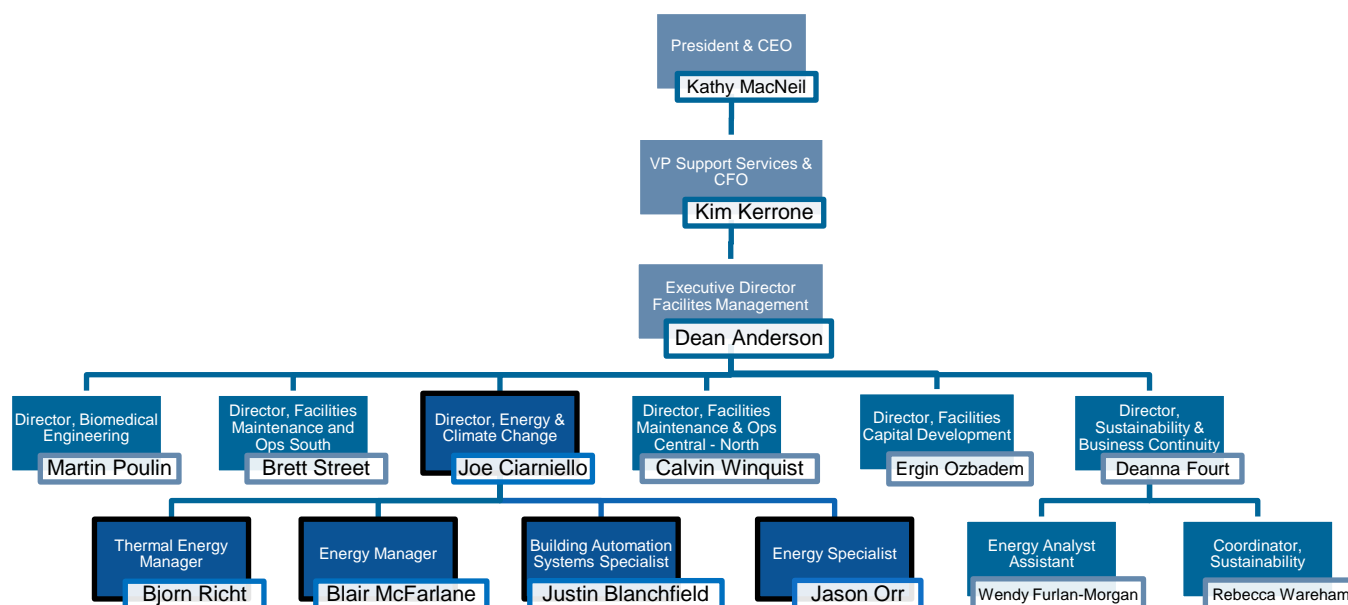
Island Health's Energy Department meets annually to establish goals that are in alignment with this framework, and to establish energy reduction targets – developed collaboratively with key stakeholders BC Hydro and FortisBC.

Overarching these goals and targets are the BC Government's legislated GHG reduction targets for the province, enacted through the *Climate Change Accountability Act* (formerly the *Greenhouse Gas Reduction Targets Act*). The provincial government's CleanBC plan (December, 2018) has set increasingly aggressive targets for the public sector requiring GHG emissions reductions from buildings by **50% by 2030**.



Organizational Chart

The Energy Department consists of a director, two managers, and two specialists. The Department reports up to the Executive Director, Facilities Management. This reporting relationship aligns with Island Health's commitment to the objectives of the Energy Management department.



3. How Are We Doing?

In this section, Island Health's KPIs are analyzed, facility groups are benchmarked, and areas of focus are detailed. Additionally, a selection of successes and good news stories are outlined within the highlights section, as well as noted challenges or underperformance within the lowlights section.

KPI Progress

Energy performance can be measured by trending the KPIs over time, which is reported within this plan. Individual projects' performance is evaluated based on avoided energy consumption by using new performance data, compared with baselined or estimated previous energy consumption. Performance can be normalized² to account for fluctuations in weather; however, capturing changes in building use and service/occupancy levels is not readily feasible. Dynamic internal and external inputs and conditions should be considered and contextualized when reviewing this plan.

The table below presents a score card of KPIs and the progress towards targets for emissions, energy, and water. Values shown in green reflect those that are performing well, red are performing poorly, and yellow indicates that the performance is close to the target.

Table 1. KPI Score Card

Goal	Baseline	Current Value (F2021)	Current Target (F2021)	2030 Target
GHG Emission Level (tCO ₂ e)	33,853	33,742	22,682	16,927
Energy Use Index (EUI) (kWh/m ²)	550	472	442	367
Water Use Index (WUI) (m ³ /m ²)	1.84	1.44	1.71	1.46
Booked Electrical Savings (kWh/year)		655,000	1,200,000	
Booked Natural Gas Savings (GJ/year)		21,511	16,000	

Note: for GHG Emissions and Water Use Index, results are for calendar 2020.

² Weather normalized data removes the influence of year-to-year or seasonal weather changes that affect the heating and cooling requirements in buildings. To enable year-to-year comparison of building-related efficiency, figures are adjusted to remove weather effects.

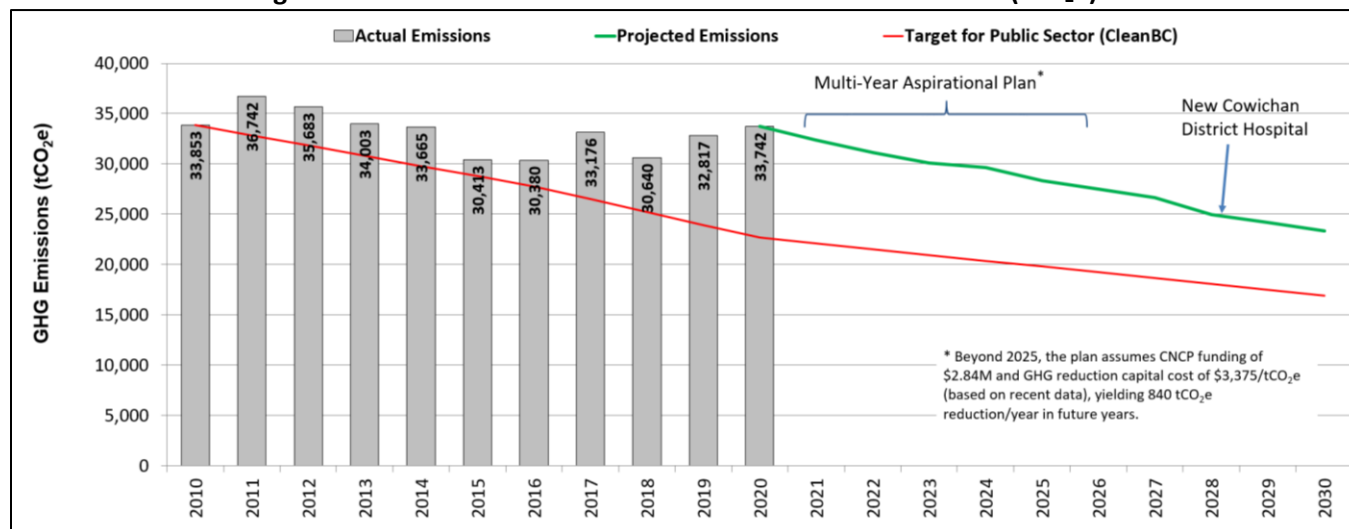
Carbon Emissions

Since 2007, capital investments in energy conservation have resulted in the majority of Island Health's GHG emissions reductions at owned sites. Heating plants within Island Health's facilities provide warm air for occupant comfort, produce hot water for sanitation, food and beverage, as well as steam for sterilization and humidification. Heating plants are the largest consumers of fossil fuels (natural gas, fuel oil, propane) within facilities, and buildings are responsible for 96% of Island Health's overall GHG emissions; a key contributor to climate change.

Figure 1 shows a relatively consistent portfolio-wide emissions profile from 2010 to 2020 of between 30,000 – 36,000 tCO₂e. This has remained consistent despite a gradual increase in portfolio floor area. This reflects an overall improvement in carbon emission performance since 2010 on a floor area basis. However, Island Health's target for carbon reduction is on an absolute basis, not a floor area (or *intensity*) basis. In order to reach the 50% reduction target by 2030, in the 2020 reporting year, Island health should have achieved a 33% reduction from the 2010 baseline, or a total emissions of 22,682 tCO₂e. Island Health is still far from this mark, which emphasizes how critical it is that investments are made to become more aggressive in carbon reduction initiatives.

The Carbon Neutral Government program recently adopted the Electricity Emissions Factor methodology already used by industry reporting under the *Greenhouse Gas Industrial Reporting and Control Act*. This change has been implemented in the Clean Government Reporting Tool and has been reflected in Island Health's inventory data. Electricity emissions factors were relatively stable at 10.0 tCO₂e/GWh prior to the update, compared to the current 40.1 (tCO₂e/GWh), a four-fold increase. As a result, the updated emissions factor for electricity has had a significant negative impact on Island Health's progress towards de-carbonization goals.

Figure 1. Island Health Offsettable Greenhouse-Gas Emissions (tCO₂e)³



Newly constructed buildings, leased and purchased buildings have increased operational floor area by 27%, and similarly full-time equivalent (FTE) employees have increased 45% from 2010 levels. The addition of operational space and staff significantly increases overall GHG emissions⁴, requiring even deeper efficiency and carbon reduction measures to meet the provincial targets. The good news is that the new Cowichan District Hospital continues to be designed through a net-zero carbon lens as are other new facilities in the planning stages.

Of the total GHG emissions, **96.1%** are associated with **buildings**, **2.1%** with **fleet vehicles**, and **1.8%** with **paper**.

³ The BC Public Sector GHG emissions reduction target for buildings is 50% by 2030 from 2010 levels for buildings (red line); CleanBC Plan – page 10. Previously, the target was based on a 40% reduction by 2030 from 2007 levels. https://blog.gov.bc.ca/app/uploads/sites/436/2019/02/CleanBC_Highlights_Report_Updated_Mar2019.pdf

⁴ This document does not address fleet or paper GHG emissions or reduction plans in detail. Island Health is working to lower emissions from fleet through electrification of passenger vehicles and conversions from diesel to compressed natural gas (CNG) for heavy trucks as the assets reach end of life. Emissions associated with paper consumption is being lowered by reducing total paper consumption primarily through digitization, and in part by procuring higher proportions of paper that is made from 100% recycled content. Recycled paper has a lower GHG emissions associated with it compared to paper products made from virgin wood pulp.

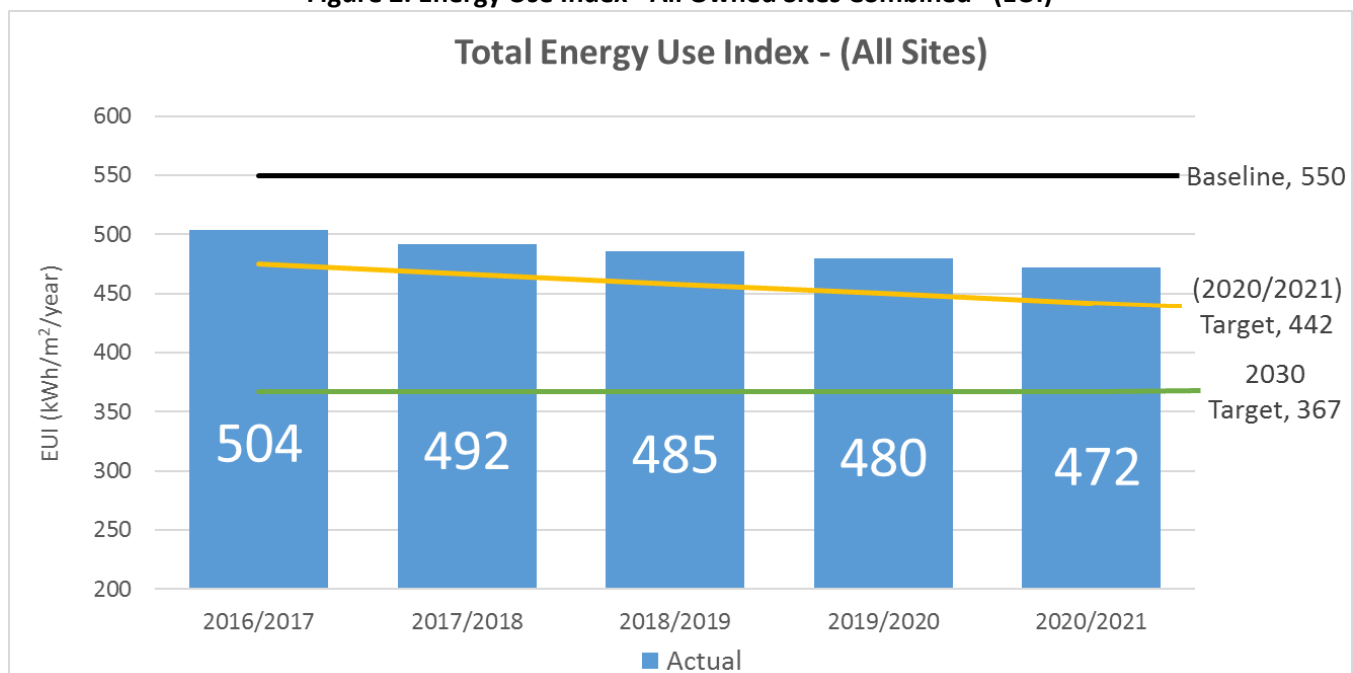
Energy Use Index

One of Island Health's key goals is to **reduce EUI to 367 kWh/m² by 2030 from F2008 levels; a 33.3% decrease**. Performance and progress towards this goal is outlined in Figure 2. Island health continues improving the operational efficiency of its building assets, driving down EUI, the best measure of long term continual improvement of building energy efficiency.

The EUI includes both electricity and fossil fuel consumption, and is normalized on a floor area basis. In F2021, Island Health has reached a new low for its total building energy use per unit floor area (EUI) of 472 – a 1.7% improvement compared to F2020. This is a positive result, and reflects many of the actions Island Health has undertaken in recent years.

As Island Health expands service delivery and quality, it consumes more energy. With less than 10 years until 2030, the challenge of GHG reduction has been set and a number of Island Health's key departments and teams must re-prioritize energy and carbon efficiency to meet it. Incremental improvements will not achieve the target. **The Energy Department has an opportunity through executive leadership support, the Climate Change Accountability Policy (Appendix B), and the many provincial and utility-based incentive programs to focus on deep retrofits, fuel switching, and operational efficiency improvements to accelerate progress.**

Figure 2. Energy Use Index - All Owned Sites Combined* (EUI)



*normalized for weather.

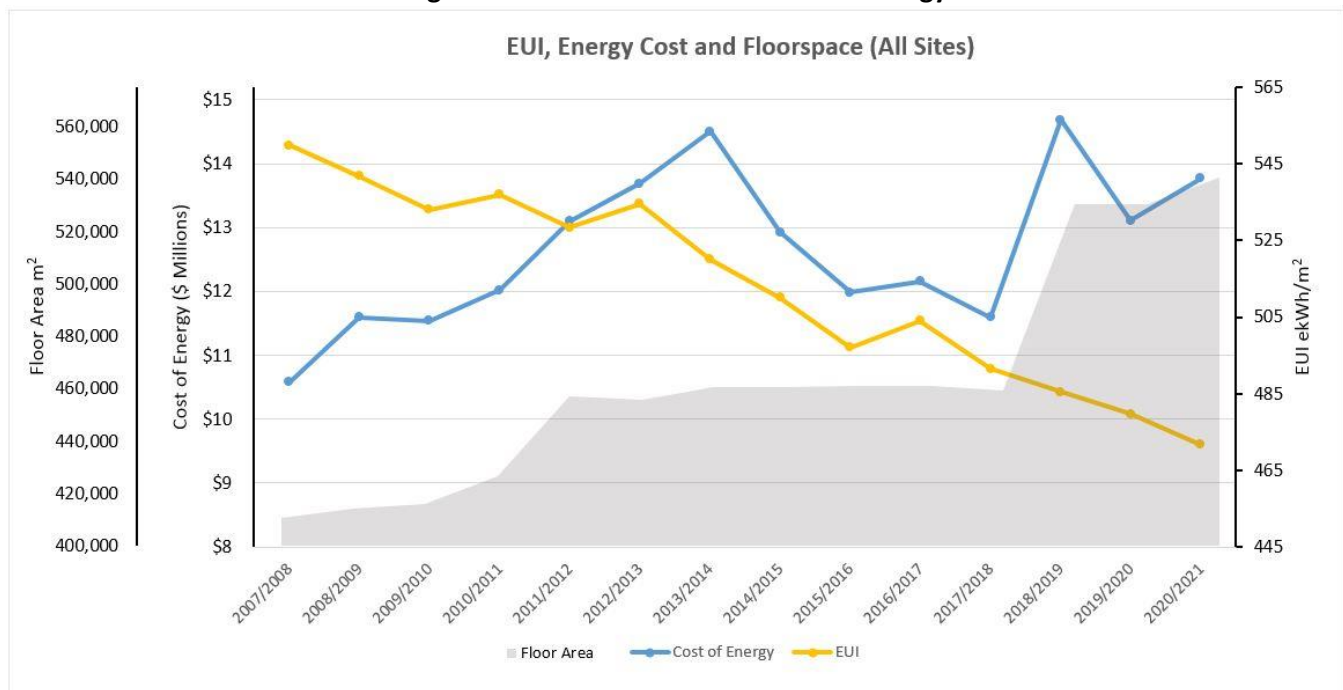
Figure 3 illustrates Island Health's expanding operations by way of increasing floor area. This highlights one of the challenges to achieving the 2030 target of 50% emissions reduction as these additional spaces need to be conditioned, and as such, require significant energy inputs. Future design of new facilities as close as possible to net-zero carbon will be a critical component of VIHA achieving the carbon reduction targets. This will not have enough of an impact on the 2030 target because not enough of the existing building stock will be replaced by then, but it will be a key lever to achieving a 2050 target.

Figure 3 also highlights the importance of reducing EUI in keeping utility costs in check in the face of a growing organization.

It should be noted that the EUI metric is a preferred performance indicator in contrast to energy costs, as the Energy Department for the most part is unable to influence or control utility rates.

The cost of natural gas has fluctuated recently and contributed most significantly to the changes in total cost of energy. Independent to market influences on the price of energy, Island Health has worked to reduce the overall energy intensity of its building assets from 550 kWh/m² in F2008 to 472 kWh/m² last year, resulting in a 14.2% weather adjusted reduction.

Figure 3. Floor Area and Total Cost of Energy

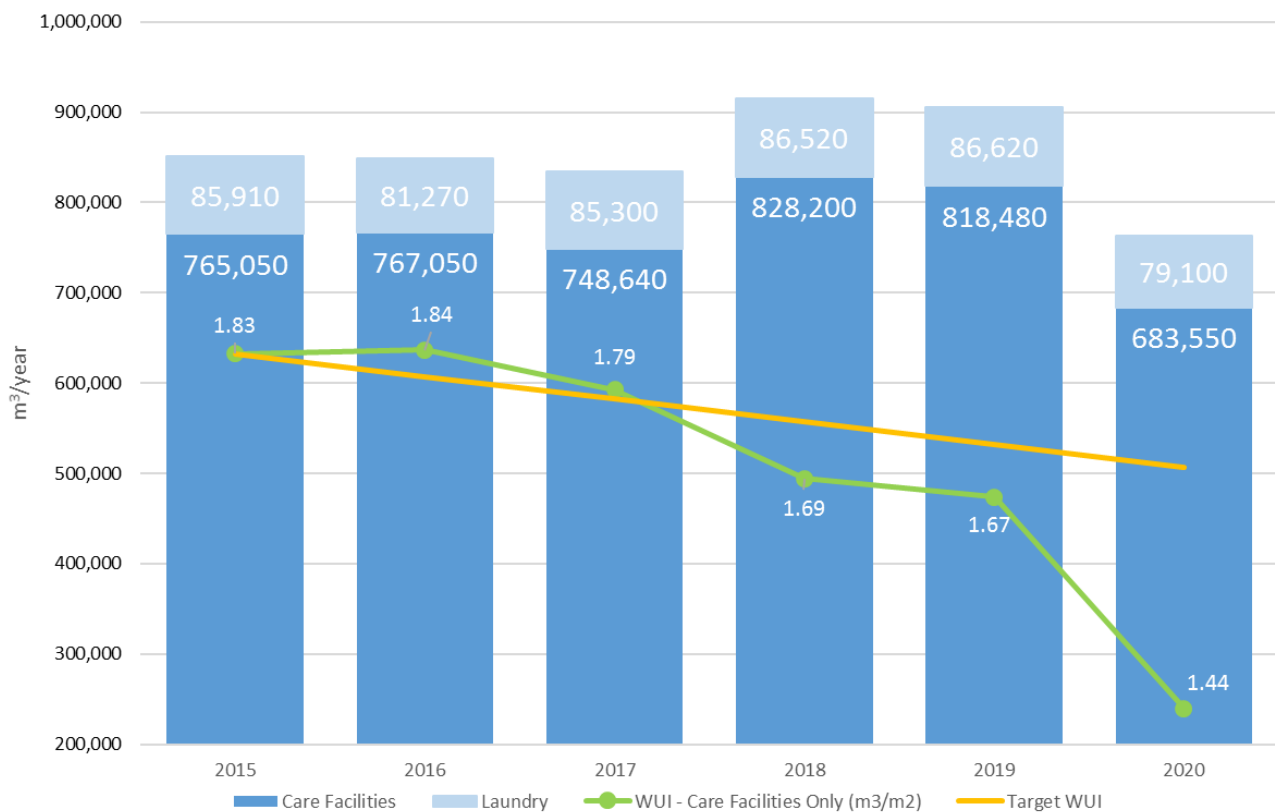


Energy use intensity of buildings is **14.2% lower** than the F2008 baseline

Water Use

The water use index has seen a downward trend over the past six years since the baseline was established in 2015. Figure 4 details the WUI in 2020 has reached a low of 1.44 cubic meters of water per square meter of building area (m^3/m^2). The total water consumption was down year-over-year by 14% in 2020, equating to 142 million litres less water consumed.

Figure 4. Water Consumption and Water Use Index



Since 2015 Care Facilities water use intensity has decreased by 21.4%

Water consumption is one of the three core KPIs outlined within this document, however, there are no existing strategic plans that address water use nor the annual reduction. The continued strong year-over-year water reduction results indicate a broader shift in culture at Island Health. The culture within facilities operations and the broader employee-base is becoming increasingly mindful of environmental stewardship and the responsible

use of resources. Facilities are being upgraded and retrofitted with more water efficient appliances, and newly constructed facilities are designed to be water efficient as well. Furthermore, staff are seeking opportunities for cost and utility savings, while ensuring care remains the top priority. While culture and operational upgrades have had continued positive impacts on the WUI, the drastic water consumption decline in Care Facilities in 2020 is generally due to COVID-19 related impacts. As a response to the COVID-19 pandemic, there was reduced use of washroom facilities, fewer visitors in care facilities, and a significant portion of employees working from home. We can expect similar results in 2021 as a return to business-as-usual has not yet been realized. As the effects of climate change are increasingly prevalent throughout Vancouver Island, water resource and supply are increasingly scrutinized and restricted. Both in response to, and in preparation for the realities of a changed climate, Island Health facilities are tactfully using less water.

Booked Energy Savings

Energy efficiency projects utilizing BC Hydro and FortisBC funded efficiency programs have cumulatively avoided \$4,002,000 in annual electricity and natural gas costs as of F2021. The energy savings associated with those efficiency programs are known as *booked savings*, outlined in Figure 5 and Figure 6, below. Annually, BC Hydro and FortisBC set energy reduction targets for the Energy Department; progress against these targets are tracked through individual incentive agreements that outline expected energy conservation improvements for the implemented solutions. These expected savings are then booked once projects are complete. In addition to booked savings, there have been many other projects, programs, and initiatives that have resulted in energy savings. It is reasonable to assume that energy savings may have actually outpaced what is shown in the figures below.

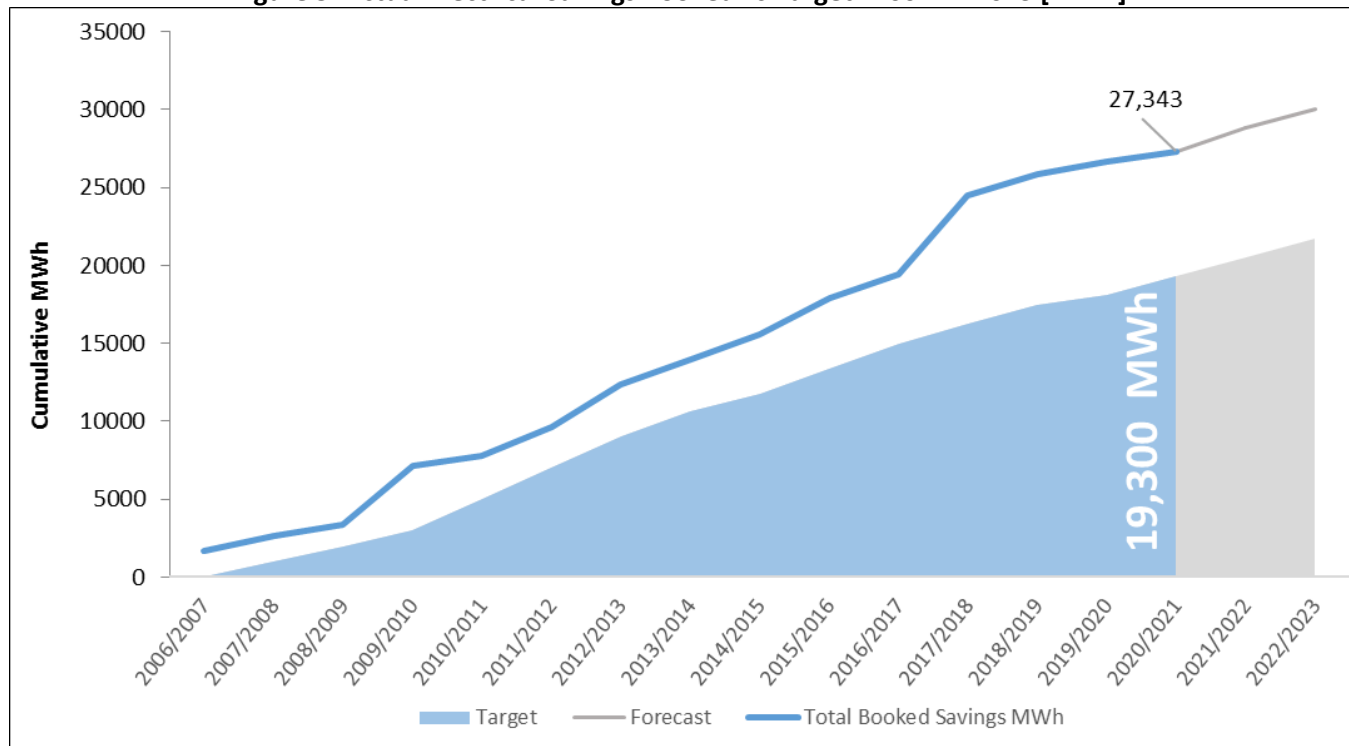
In F2021, the cumulative avoided cost of energy from **all** past energy efficiency projects reached **\$4,002,000/year**



Booked Electrical Energy Savings

Energy savings accumulated over time is more indicative of the energy management program performance, rather than savings achieved in any one year, as seasonal or fiscal-based variability can impact performance. A graphical representation of the department's performance against the BC Hydro target is shown in Figure 5, and demonstrates that Island Health continues to exceed BC Hydro savings expectations over the long term.

Figure 5. Actual Electrical Savings Booked vs Target F2007 – F2023 [MWh]



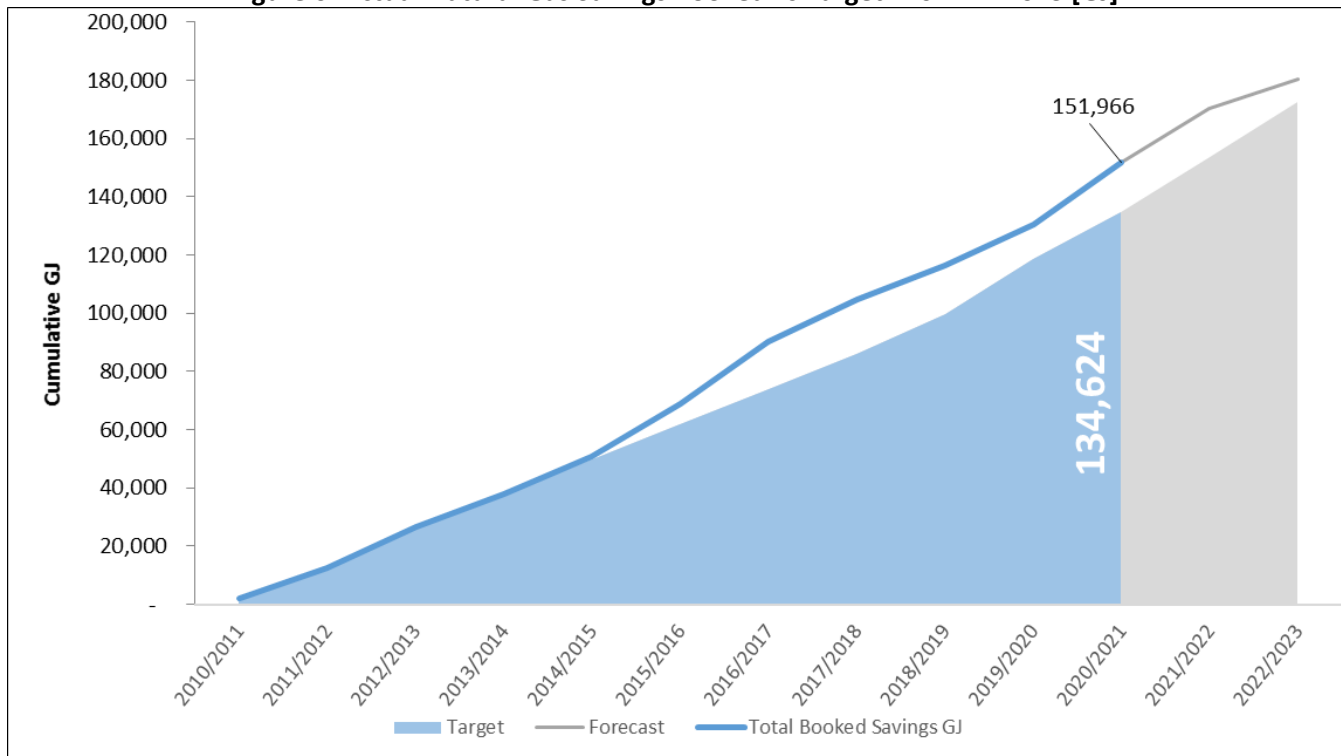
In F2021 the blended cost of a unit of electrical energy was \$0.0829/kWh. This is a blended rate inclusive of all charges, taxes, fees and offset payments. Based on this rate and **the cumulative impact of energy projects since F2007, Island Health is currently avoiding \$2,326,000 in annual electricity costs as a result of those projects.** Appendix C provides historical data in a chart.

Island Health avoids \$2.32m in annual electricity costs as a result of conservation projects

Booked Natural Gas Energy Savings

Natural gas savings are accounted for by FortisBC through a variety of their conservation programs. Figure 6 below shows portfolio-wide natural gas savings since F2011 and illustrates how performance remains above target. FortisBC formally entered the energy conservation effort in F2011 with the launch of the Energy Specialist program and expanded rebate offerings that promote efficient use of natural gas.

Figure 6. Actual Natural Gas Savings Booked vs Target F2011 – F2023 [GJ]



The average blended cost of a unit of natural gas in F2020 was \$9.08/GJ. This is a blended rate inclusive of all charges, taxes, fees and offset payments. Based on this rate and **the cumulative impact of energy projects since F2011, there is an annual natural gas cost avoidance of \$1,675,000 as a result.**

Energy and Cost Benchmarks

Benchmarking buildings by facility type groups, based on their health care purpose, enables the Energy Department to quickly determine which grouping is performing more efficiently, or inefficiently, as determined by the EUI outlined in Figure 7. By making this assertion, the Department can then identify where priority focus should be made in planning energy efficiency upgrade projects. Figure 8 benchmarks cost intensities for each of the facility type groups.

The EUI represents the electricity and fossil fuels that are consumed to meet building needs for heating, cooling, lighting, ventilation, domestic hot water, clinical functions and process loads. Clinical functions include medical imaging and laboratories. Process loads include elevators, space humidification, sterilization and food service kitchens. Backup boiler and generator fuels are not included here.

Individual facility EUIs are detailed in Appendix D.

Figure 7. EUI by Building Type F2017 to F2021 (kWh/m²)

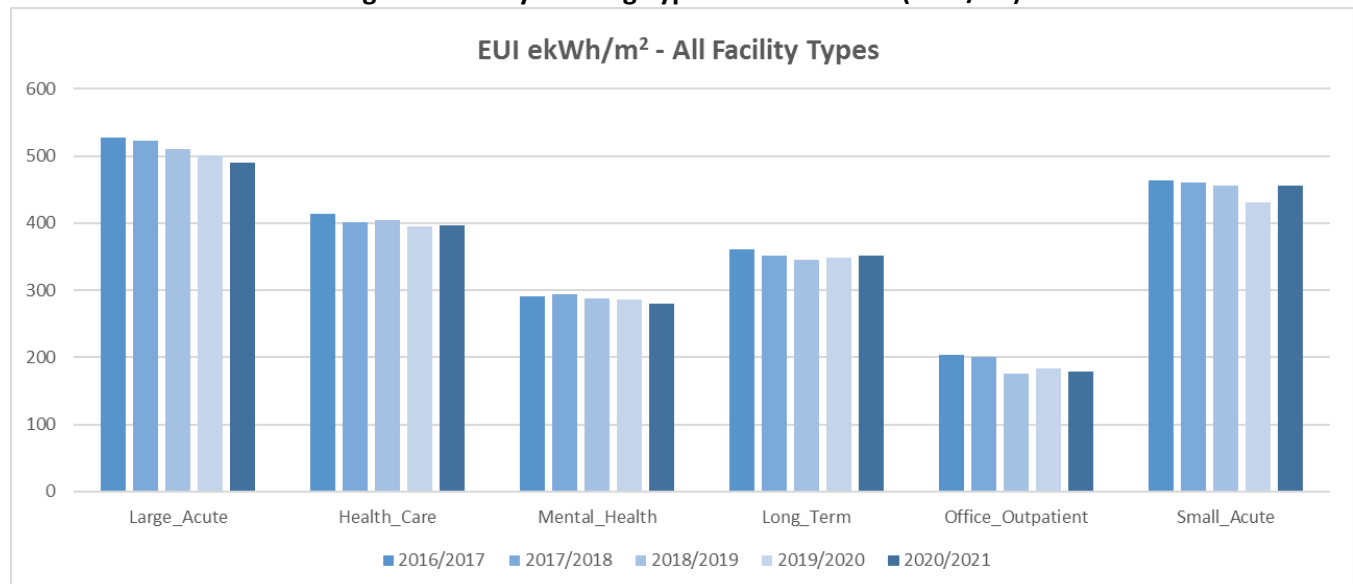
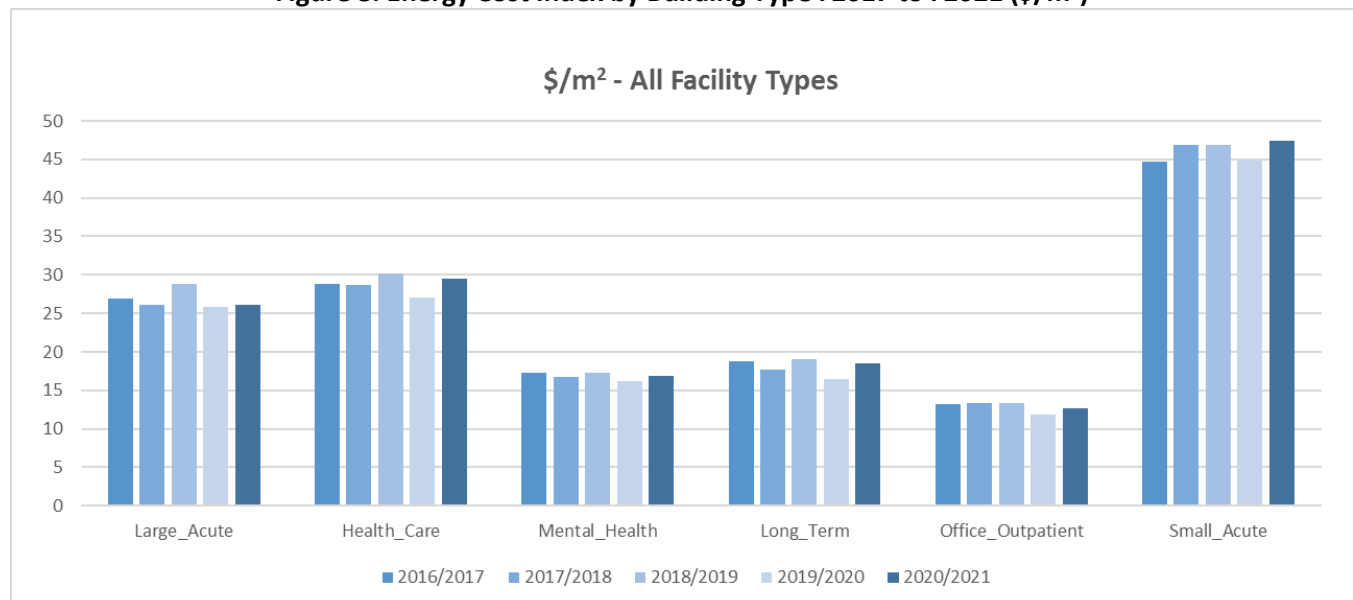


Figure 8. Energy Cost Index by Building Type F2017 to F2021 (\$/m²)



Large Acute Care have unique requirements and provide the most services. Large Acute Care facilities consume the most energy of all the buildings, accounting for 72% of all consumption in F2021.

Large Acute Care Centres accounted for 72% of Island Health's total energy consumption in F2021

Long Term Care facilities are the second highest consumer of energy. These facilities are not as energy intense as hospitals, focusing instead on providing a home-like environment for residents. Long Term Care facilities consumed 14% of the total energy in F2021.

Small Acute facilities are mostly located in and serve rural communities. These facilities consumed 2% of the total energy in F2021.

Health Care facilities serve patients on a short term, primary care or urgent care basis. Health Care used 2% of the total energy consumption in F2021.

Office and Outpatient facilities have been grouped together due to their similar usage profiles. Operating typically during weekday office hours only, these facilities consume the least amount of energy within the portfolio. Office/Outpatient facilities consumed 1% of the total energy in F2021.

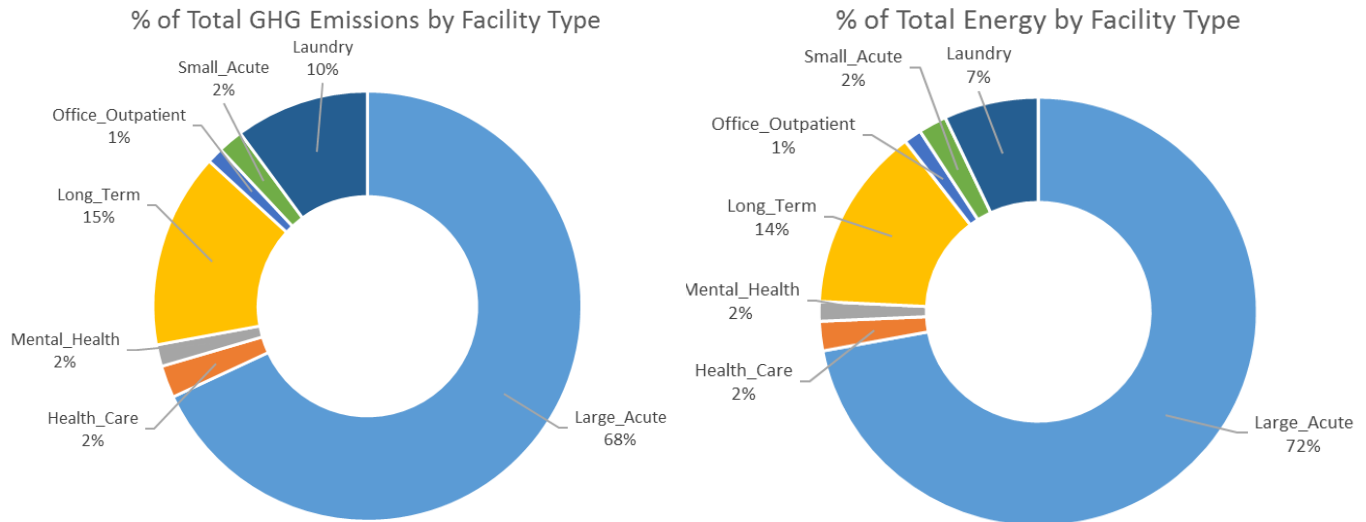
Mental Health facilities serve a variety of patients who require mental health and substance use services. These facilities consumed 1% of the total energy in F2021.

Due to their unique service delivery, laundry facilities' energy use is primarily driven by the amount of laundry processed. Laundry Facilities are not included in the benchmarks figures above, however, details are found within Appendix D. There is a small amount of energy used to maintain space comfort and make hot water for domestic use. In total, the two laundry facilities, Cumberland Regional Laundry and Victoria Regional Laundry, combined used more than 7% of all energy consumed by Island Health in F2021.

Areas of Focus

The Energy Department's efforts continue to focus on opportunities which have the greatest potential to reduce energy consumption and GHG emissions. As always, the facility type which is the largest consumer of energy are large acute care centres. Figure 9 shows the percentage of of the total emissions and energy consumed by each different facility type. Large Acute Care centres have both the highest total energy consumption and gross GHG emissions. Figure 9 also illustrates the close link between energy consumption and GHG emissions.

Figure 9. Total GHG and Total Energy Use by Building Type (%)



Highlights and Lowlights

Year-to-year the energy management landscape alters at Island Health with varying degrees of successes and challenges; some of which are persistent through multiple years. Highlights from F2021 include significant traction in terms of a growing energy and carbon efficient culture and influence within key stakeholder groups, and lasting impacts on guiding documents and policy that promote climate action and resilience in the healthcare sector. Additionally, the positive overall performance of facilities within the portfolio contributed to KPI goals and translated into financial benefits.

↑ Highlight: Organizational EUI Improvements

Energy Use Index has been on a constant decline:

- 1.7% reduction in F2021 compared to F2020,
- 5 consecutive years of decline (F2017 to F2021), totaling 6.5%, and,
- EUI reductions in 9 of the past 11 fiscal years.

These persistent improvements in efficiency are the direct result of a department, supported by many key stakeholders, dedicated to addressing wasted resources and seeking opportunities for internal and external collaborations that are working to usher in a new era of efficient, low-carbon operations.

↑ Highlight: Water Use Index Target Exceeded

The 2030 Water Use Index Target of 1.46m³/m² has been exceeded by 1.4% ten years in advance. 2020 was a particularly strong year for water use reductions as 142 million liters were spared compared to 2019, and the WUI improved by 14%. Some operational improvements were made, however, the bulk of the savings can be attributed

to COVID-19 related behavior changes within Island Health facilities. The target and annual goals will be reviewed to determine if there should be higher aspirational goals developed for the Water Use Index.

↑ **Highlight: Team Development & Utilities' Support**

BC Hydro and FortisBC have been long-standing partners in the development of Island Health's energy management program. These utility providers have recently made further investments into the team. FortisBC, for example, has created two new programs by funding a new Energy Analyst position as well as a new Thermal Energy Manager position. Both BC Hydro and FortisBC have partnered to fund an innovative Building Automation System Specialist position – the only one of its kind in BC, as well as approving funding for a Director of Energy role. The essential nature of the resources provided by BC Hydro and FortisBC cannot be understated. Without the constant and increasing support of these utility providers, Island Health would not have made such gains in its EUI performance, avoided utility costs, and upskilling of the Energy Department staff.

↑ **Highlight: Increasing Internal and External Influence**

- *Designing for a Changing Climate* addendum added to prime vendor contracts without push-back from the market. Island Health now requires that all engineers and architects hired to design new buildings or retrofits to existing facilities must use projections of future climate to inform design, and not rely solely on climatic design data in the building code.
- Ministry of Health (MoH) updated the *Health Capital Policy Manual* (Appendix E) based on recommendations in part from our team (both Energy and Sustainability). The Lower Mainland Health Authorities and Island Health collaborated to stress the growing need for more rigor and higher levels of performance expected in capital projects – as related to environmental sustainability. Recognizing the growing threat of climate change, the policy update adds specific requirements to minimize GHG emissions and reduce risks associated with warming climate by identifying, assessing, and treating those risks.
- *Zero Carbon Building Design* standard has been approved to be a Cowichan District Hospital Replacement Project (CDHRP⁵) stretch target for the GHG emissions KPI. The standard not only encourages minimizing operational emissions, but also embodied emissions, which can be significantly greater. As part of the new CDHRP, both energy efficiency and GHG emissions performance targets have been established through a series of modeling exercises based on the current proposed design.

↑ **Highlight: Natural Gas Spend, Positive Variance**

The difference in the F2021 actual natural gas expenditure compared to the allocated budget resulted in a positive variance of \$556,985. Energy management is a useful approach to mitigating organizational risk and exposure to volatile utility rate increases, such as the 12% rise in blended natural gas rates in F2021 compared to the previous fiscal year. The remaining funds stay within those cost centres that realized a positive budget variance, enabling additional purchases of goods and services at those locations, or to offset negative budget variances in other areas.

⁵ List of facility acronyms in Appendix A

↓ **Lowlight: Electricity Emissions Factor Increased, Slow Reduction of Carbon Emissions**

The Carbon Neutral Government program adopted the Electricity Emissions Factor methodology already used by industry reporting under the *Greenhouse Gas Industrial Reporting and Control Act*. This change has been implemented retroactively as of 2021 in the Clean Government Reporting Tool and has been reflected in Island Health's inventory data. Electricity emissions factors were relatively stable at 10.0 tCO₂e/GWh prior to the update, compared to the now 40.1 (tCO₂e/GWh), a four-fold increase. The updated emissions factor for electricity has had a significant negative impact on Island Health's progress towards de-carbonization goals as a result – exacerbated by the fact electrification has been on the rise in recent years.

↓ **Lowlight: Existing Systems Challenges**

The Victoria Regional Laundry (VRL) Heat Recovery System is not functioning as intended. The heat recovery system was initially installed in 2016 and reduced VRL's natural gas consumption, per ton of laundry, between 12-15% per year. The heat recovery system has failed due to an accumulation of lint and the inadequate ability to maintain the mechanical components within its apparatus. A solution to this challenge would result in roughly \$45,000 of natural gas savings, and 270 tons of avoided CO₂e emissions annually. A solution is currently being investigated for piloting.

West Coast General Hospital (WCGH), located in Port Alberni, has been the subject of a cooling system "deep dive" to determine the causes and outline solutions to inadequate cooling capacity. The challenges associated with the cooling system have hindered the performance of other systems and equipment within the facility, and ultimately resulting in a higher EUI than it should have. The deep dive report has provided operators with some low-cost/no-cost solutions that can help the systems perform more efficiently and ultimately provide adequate cooling when it is needed most during heat waves. The investigation also confirmed that some of the pumping and heat rejection equipment was undersized. This will be addressed in the future.

↓ **Lowlight: COVID-19 Related Challenges**

The COVID-19 pandemic affected healthcare facilities not only at the bedside, but also in terms of energy consumption in many facilities as 100% outdoor air was introduced into spaces that traditionally would recycle a portion of indoor air. In addition, ventilation that would normally be scaled back during unoccupied periods was set to remain at full flow 24/7 in order to maximize fresh air into the buildings. There has been a widely accepted concern that the virus lived on surfaces for a relatively unknown duration, this spurred a shift in behavior related to increased sanitation.

Socially, the team was unable to host meetings and workshops with key stakeholders in attendance. Furthermore, many of those colleagues and operators were pre-occupied with COVID-19 related directives and changes to typical operating conditions making them unable to collaborate with the Energy Department to the same degree as years prior.

↓ **Lowlight: Electricity Spend, Negative Variance**

In F2021 Island Health spent an additional \$239,522 on electricity compared to the allocated budget. This was in spite of electricity rates declining by 1% compared to the previous year, further entrenching electricity costs as a lowlight for the year.

4. GHG Reductions – How Do We Get There?

To meet the target of a 50% GHG reduction by 2030, Island health must cut emissions on average 1,682 tCO₂e each year. To achieve this, **significant additional investments will need to be made** in the following areas:

Optimize Existing Assets	<ul style="list-style-type: none"> • Launch an aggressive continuous optimization program facilitated by a new Building Automation Systems Specialist and budget for parts and labour to optimize existing building systems
Efficiency & Electrification	<ul style="list-style-type: none"> • Replace older equipment with new more efficient models • Retrofit mechanical systems to more efficient designs • Where feasible, use heat pumps which can substantially lower the requirement for fossil fuels
Deep Retrofits	<ul style="list-style-type: none"> • Convert to lower temperature heating systems • Upgrade building envelopes
Renewables	<ul style="list-style-type: none"> • Switch to biomass fuels at off-gas-grid sites • Secure RNG for 2030 and beyond to cover shortfall in GHG reduction • Solar PV as prices continue to decline

The Energy Department has worked diligently to address and influence the first three items outlined above. By developing the Building Automation System Specialist (BASS), a skills and capacity gap within the Department has been filled. The BASS is to focus on optimization of existing systems and equipment using technical expertise, as well as providing leadership to Building Control Systems Techs throughout Island Health in order to implement and support energy efficiency improvements.

The Royal Jubilee Hospital Heat Recovery Project is an excellent example of improvements that can be made within facilities by way of equipment upgrades, re-invisioning systems, and collaborative partnerships. The RJH project will deliver a 13% GHG reduction for the site, and contribute to a 3.2% decline in organizational carbon emissions. The early success of this project is providing a template for similar opportunities to be realized at other sites throughout the portfolio.

Electrification of systems and equipment refers to the process of replacing technologies that use fossil fuels with technologies that use electricity, an energy source that has a much lower carbon intensity. Electrification projects are becoming more prevalent within the master project list (refer to Table 3) which provides significant

opportunities to reduce carbon emissions. In some cases, by installing heat pumps, mechanical cooling can be provided to cool a space that was traditionally underserved or did not have any cooling thus also addressing a key consideration of climate adaptation within Island Health Facilities.

Increasing the electrical load through electrification appears contrary to the goal of achieving electrical savings to meet BC Hydro's targets. Electrification, however, is required to reduce carbon emissions and this actually creates a greater need for conserving electricity. By conserving electricity in other areas of operations, electrical capacity can be freed up to ensure there is sufficient power for the systems that replaced those driven by fossil fuel. This highlights the evolution of a conservation focussed lens in energy management, to one that now includes electrification and increasing consumption as well. Overall energy conservation remains a core component of Island Health's energy management program. While electricity use may increase, the savings in fossil fuel offset this by a factor of 2 to 3. It can be expected to see this trend in continuing year over year decline in the EUI as this is fiscally prudent.

As weather becomes more extreme, building systems, equipment, and envelopes are strained. There is increased attention being given to the condition of building envelopes as to improve resilience to extreme weather events and maintain comfortable conditions within the building.

If Island Health was to utilize renewable natural gas (RNG) as an emissions reduction lever, based on today's prices, we would have to pay a premium of \$115,000/year to cut emissions by 1,000 tCO₂e. Therefore, with regards to what happens beyond 2030, the purchase of RNG may need to be considered through increased operational funding if the program falls short of the 50% reduction target.

To be effective in achieving results in the areas outlined in the graphic above, the following needs to be addressed:

Funding

The annual funding required to achieve the decarbonization target will need to be substantially increased to a minimum of approximately \$6 million. This estimate is based on a historical average incremental cost of \$3,375 per tCO₂e reduction through energy and carbon efficient system and equipment retrofits. In the next three years, projects targeting GHG emissions will achieve reductions at a cost of approximately \$5,200/tCO₂e based on the current MYP, pointing to a clear trend of increasing costs. The cost of carbon reduction measures could be lowered with a more strategic focus during asset replacement.

Planning

To develop a more detailed path for achieving our GHG reduction target, and accurately estimate the cost, Island Health is preparing a request for proposals to find a qualified firm that can assist the Department in developing the long-term plan. This plan will provide details such as which projects to execute at each site and when. In addition, we are developing a departmental charter that will include guidelines for decision making on all capital projects. This guideline would establish, for example, the types of projects that are most efficient in terms of

emissions reduction and how alternative systems and equipment should be evaluated. To help make the case for lower carbon approaches, the Department now uses a much higher cost of carbon when evaluating capital projects, one that aligns with the federal government's plan to increase carbon tax to \$170/tCO₂e by 2030.

Projects

Over a longer time horizon, the Energy Department and the variety of stakeholders associated with energy, carbon, and climate action need **to identify significantly more projects that can substantially lower GHG emissions**. Identifying low-carbon projects provides value in that when funding is made available there is an extensive list of available projects in varying states of readiness to implement. Strategic project planning is a key component of decarbonizing Island Health's facilities and assets, however, **the availability of capital funding will ultimately be the core component that drives low-carbon solutions** to implementation.

At present, due to limited capital funding for infrastructure renewal, Island Health has been utilizing funding from the Ministry of Health's Carbon Neutral Capital Program (CNCP) to tackle both lowering emissions and infrastructure renewal. In doing so, the opportunities to achieve the 1,682 tCO₂e annual reduction goals are limited. As more capital is made available and the Energy Department becomes more strategic in its approach to decarbonization, CNCP funds will be decoupled from infrastructure renewal and instead will be applied in more targeted emissions reduction projects. For example, these funds will be used to pay for the marginal costs only of enhancing the GHG reduction potential of infrastructure renewal projects, as well as the full cost of dedicated GHG reduction projects.

New Island Health Facilities

Cowichan District Hospital Replacement Project

The new 47,000m² hospital project planned for the Cowichan Valley to replace the existing Cowichan District Hospital is now in the middle of procuring the design and construction team through a new Alliance Competitive Selection Process. Occupancy is expected in 2026.

The new hospital will be located on a greenfield site, will be LEED Gold certified, and will target additional levels of energy efficiency and GHG emissions reduction beyond what LEED requires. Energy and emissions modeling completed in support of the business plan and indicative design, predicts that operational emissions will be 226 tCO₂e/year or 83% below the existing hospital's 2010 baseline. The modeling also predicts energy efficiency will be 39% better than if the hospital were designed to code (National Energy Code for Buildings 2017) at 405 kWh/m²/year. Specific measures to reduce energy consumption and GHG emissions will be finalized by the design and construction team. It is expected that measures will include electrification of some equipment and advanced heat recovery systems to minimize natural gas requirements. It will also likely include a large solar PV array on the

roof to help offset purchased electricity and lower peak electrical demand. The project has been enrolled in both FortisBC's Commercial New Construction (CNC) program as well as the province's CleanBC CNC program.

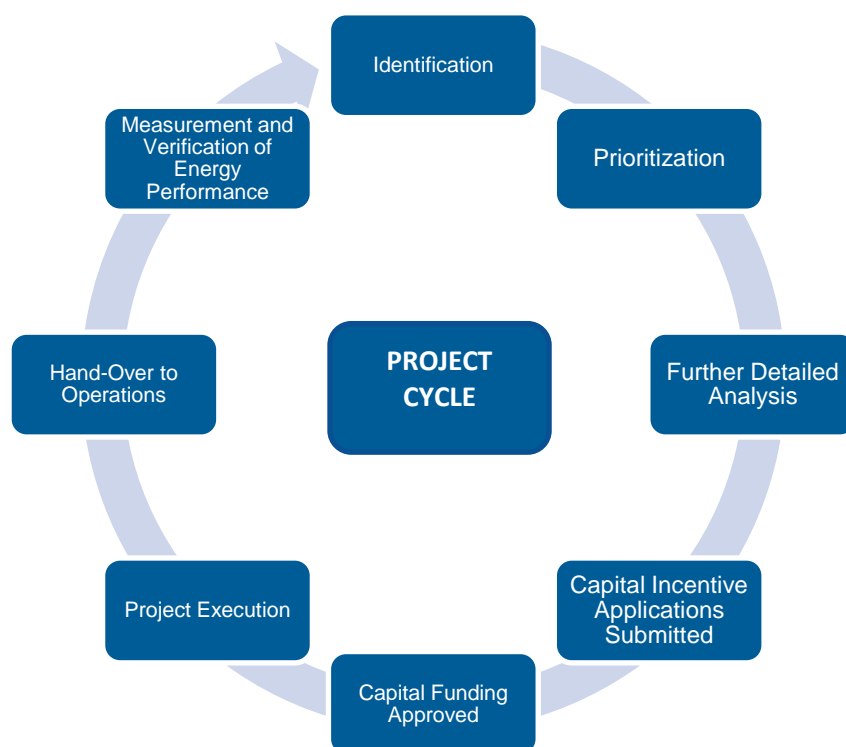
A first for a hospital in Canada, this project has been enrolled in CaGBC's new Zero Carbon Building (ZCB) program. Achieving the ZCB certification is not a certainty, but it has been accepted by the Island Health team as a stretch target for the project. A stretch target means there is potential monetary gain if the design and construction team achieves the standard, something that's possible within this new Alliance procurement model. The requirements of this standard align with the department's objectives to minimize energy and emissions, but go further to include accounting for and offsetting embodied emissions. An initial embodied carbon report has shown embodied carbon will be nearly 50 times greater than the annual operating carbon emissions from the hospital. This highlights the importance of construction materials selection as a way to also minimize Island Health's contribution to climate change.

Royal Bay Long Term Care

A new 39,000 m² long term care facility is being planned for the Victoria, BC region and a business plan has recently been prepared and submitted to the province for approval. An energy and emissions modeling study was also developed to support the business plan and assess a variety of measures to minimize energy and GHG emissions. The study also considered the impact of eliminating the combustion of fossil fuel entirely from the site by fully electrifying all systems. The final design and selection of energy conservation and GHG reduction measures will be made at a later date, long after the project is approved for funding and the design and construction team is selected. This project is currently being enrolled in both the FortisBC and CleanBC CNC programs.



5. Planning



Identification of energy projects:

- **Energy Audits:** A detailed analysis of building operations carried out by energy managers or qualified engineering consultants that seeks to find and assess the technical and financial viability of energy and emissions saving opportunities.
- **Capital Projects:** The Facilities Design & Construction team applies an energy efficiency and GHG reduction lens to renovation, retrofit and replacement projects which are occurring as part of infrastructure renewal plans.
- **Facilities Operators:** Integral staff that have intimate knowledge of energy consuming systems, building components, unique facility use circumstances, and are proficient in identifying energy saving opportunities within.

Prioritization of energy projects:

1. End of life or risk of failure (immediate need in contrast to pure efficiency improvements)
2. GHG reduction potential and energy savings
3. Fiscal performance (operations and maintenance savings, marginal capital cost increase)

Upon identification and prioritization of projects, a more detailed engineering analysis and costing exercise is carried out to confirm technical feasibility and more accurately quantify energy savings and project costs in an effort to minimize risks and uncertainty. This further analysis ultimately lends itself to improved strategic project planning, selection, and delivery. Study costs are often partially funded by our utility partners, BC Hydro and FortisBC, or by the provincial government through the CleanBC program. Upon completion of studies, with the project benefits being confirmed, capital incentive funding applications are submitted to FortisBC and BC Hydro. When capital funding is approved, the project is then transitioned from the Energy Department to the capital project delivery team, who is then responsible for the detailed design and construction process.

During project execution, the Energy Department supports the project teams by contributing to design and interfacing with operations to prepare for the new equipment and systems being installed. Upon completion, the project is turned over to operations. The Energy Department has numerous responsibilities and actions to close out a project. The Department reviews operational data to confirm energy efficiency improvements have been achieved, close out the rebate or incentive requirements to secure the funds, and ensure that the energy savings are recognized, or “booked” by BC Hydro and FortisBC and credited to any contractual obligations.

Multi-Year Plan

Each year, Island Health’s Energy Department updates a multi-year plan (MYP), an integral part of the SEMP, through focused strategic planning sessions. The MYP identifies electrical and fossil fuel energy savings and resultant GHG emissions reduction from currently approved capital projects and projects proposed in future years. The MYP evolves as new and potentially better opportunities are uncovered through energy studies and advances in technology. The MYP is a component within the master project list (MPL), which is used to strategically develop projects that help us meet the KPI targets and achieve the stated goals. The KPI annual targets for F2022 are set as shown in Table 2.

Table 2. KPI Multi-Year Plan Projected Results

Goal	Annual Target	F2022	F2023	F2024	3 Year Average
GHG Emission Reductions (tCO₂e)	1,682	1,233	1007	474	904
Energy Use Index Reduction (EUI) (kWh/m²)	9.6	13.5	12.3	7.4	11.1
Water Use Index Reduction (WUI) (m³/m²)	0.02	0.02	0.02	0.02	0.02
Booked Electricity Savings (MWh)	1,200	1,526	124	240	630
Booked Natural Gas Savings (GJ)	16,000	18,222	10,331	7,513	12,022

The MPL also allows the Energy Department to keep track of the status of all active and potential projects, and in particular, the expected and actual return on investment. In doing so, the team is able to identify whether there

are sufficient projects underway to meet the objectives and targets of this SEMP. If not, the team uses the MPL to revise the plan in order to ensure objectives are met.

The MPL is used to capture any and all ideas to be evaluated each year. This ensures the Department does not lose sight of opportunities and that there is a healthy source of new ones to draw from as funding is made available.

Budgets shown in the first year of the MYP, Table 3, have already been approved. Capital requests have been submitted for projects in future years but approval is uncertain at this time. Projects that are approved will be identified and funds released at the start of each fiscal year.

Projects highlighted in yellow fall into the “low-carbon electrification” category and may qualify for current provincial incentives under the new CleanBC program.



Table 3. Multi-Year Plan Detailed Project List

Fiscal Year	Program Type	Project Name	Electrical Energy Savings [kWh/yr]	Fossil Fuel Savings [GJ/yr]	Greenhouse Gas Savings
2021/22	CleanBC Custom	YLR5 - Heat Pump Installation - CNCP	-198,663	3,538	174
	CleanBC Lite	CICHC - Heat Pump DHW System (reduces propane) - CNCP	-25,100	542	33
		NRGH - Lab AHU Replacement	-72,715	1,163	57
	CON-OPS (BCH+FBC)	Summit Continuous Optimization Implementation	380,000	1,300	69
		NRGH - Upgrade Kitchen Refrigeration Systems	47,000	0	1
	CUSTOM (BC Hydro)	Mt. St. Mary's Lighting Upgrade Phase 1	184,230	0	2
		GRH - New Fan Motors and VFDs	44,000	0	0
	CUSTOM (FortisBC)	RJH - PCC HVAC Conservation Measures - FBC Gas Savings	0	4,945	247
	Fortis GTD	VRL-Heat Wheel Replacement Pilot Project GTD		546	27
		WCGH - Pipe Insulation	0	569	28
		EPLTC - Pipe Insulation	0	78	4
	INSULATION UPGRADE	VRL Insulation Upgrade	0	620	31
		RJH - Mechanical Piping Insulation		467	23
		VGH - Insulation Upgrade		1,043	52
	PROGRAM ENABLED	RJH - PCC HVAC Conservation Measures - BCH Program Enable	365,000	0	4
	PSPX	RJH - West Block 4 Biomedical Engineering Reno Lighting	25,352	0	0
	STEAM BOILER REBATE	CDH - TDS Blowdown Control		177	9
		RJH - Steam Trap Repair	0	2,620	131
		VRL - Steam Trap Replacement		48	2
	VIHA FUNDED	RJH - Campus Elevator Refurbishments	150,000	0	2
		NRGH - Heat Recovery on EF2 and New OR Exhaust	-380,000	4,637	227
		CLRC - DHW Re-piping		18	1
		QAC-Ledger scheduling analysis		150	7
		Multiple Sites - EndoTherm Pilot		2,025	101
2021/22 Total			519,104	24,486	1,233
2022/23	BOILER	TLLTC - Electric Boiler Replacement	1,210,339	-5,215	-247
	CleanBC Lite	NRGH - Hydrotherapy Heat Recovery AHU – CNCP	-44,175	878	43
	CUSTOM (BC Hydro)	PHH - Lighting Upgrade - BCH\$	124,058	0	1
	CUSTOM (BCH+FBC)	GRH - Envelope Upgrade (Window Replacement)	0	630	31
		VGH - DHW System Renewal	991	426	21
	CUSTOM (FortisBC)	VGH - Air Handling Unit Renewal	249,422	1,971	101
		QAC-Pearkes - Heating Plant Renewal Option	21,226	270	14
	INSULATION UPGRADE	VRL - Remaining Pipe Insulation		180	9
	STEAM TRAP REBATE	NRGH - Steam Trap Audit/Repair/Replacement	0	350	17
		NRGH - Replace Rehab Chiller with HR and HE Models - CNCP	-482,480	14,319	709
	VIHA FUNDED	NRGH - Rehab AHU Renewal Phase 1 & 2 of 6	-48	1,234	62
		VRL-Heat Wheel Replacement Pilot Project - Full Set		4,914	245
2022/23 Total			1,079,333	19,957	1,007
2023/24	CUSTOM (BC Hydro)	CHC - Lighting Upgrade - BCH\$	126,642	0	1
		TLLTC - Lighting Upgrade - BCH\$	114,282	0	1
	CUSTOM (FortisBC)	CPRC - Boiler & DHW Systems Renewal – CNCP	18,238	847	42
		SPH - DHW System Renewal & Optimization – CNCP	11,300	880	44
		CLRC - Energy Efficiency Upgrades	52,000	560	28
		PHH - Energy Efficiency Upgrades	3,100	140	10
		PHH - Zoning for Ventilation & Temperature Setback	98,000	250	18
		LMH - Heat Recovery 4920 UPDATED (for ECU lab & DHW)		0	0
		RJH - Chiller Plant Eliminate Quasi-Tertiary Pumping	125,653	0	1
		RJH - Chiller Plant Chilled Water Optimization Phase 2	80,687	0	1
	VIHA FUNDED	NRGH - Chiller Systems Optimization Phase 1	760,124	3,397	178
		TLLTC - Pipe Insulation	35,208	0	0
		TGH - Pipe Insulation (reduces propane)	0	32	2
		NRGH - Rehab AHU Renewal Phase 4 & 6 of 6	-66	1,569	78
		NRGH - Rehab AHU Renewal Phase 3 & 5 of 6	18	0	0
		OHC - Lighting Upgrade		0	0
	VIHA OPERATIONAL	RJH - EMP L1 South Perimeter HVAC Upgrade	68,532	1,354	68
2023/24 Total			1,493,718	9,030	474

6. Risks & Challenges

There are a number of risks and challenges that need to be considered in planning and executing towards the goals of this SEMP, as follows.

Table 4. Risk Matrix

Risk	Mode	Impact	Response
Increasing Building Use Hours or Occupancy	Increases EUI of buildings, offsetting positive impact of energy efficiency measures	LOW: More challenging to meet EUI reduction goal	Accept: Higher asset utilization is a good thing when paired with an increase in health care capacity. If there is a large change, the team can evaluate the possibility of normalizing data.
Growth of Operational Floor Area	Increases total energy use offsetting positive impact of energy efficiency measures	LOW: Facility area growth is expected to be at least 5% over the next 10 years	Accept: Additional operational area can be quantified. However new buildings should be designed to have zero net GHG emissions.
Locking Into Fossil Fuel Infrastructure	Installing new boilers locks in fossil fuel consumption and required offset payments for the life of the new equipment	HIGH: Prevents deep reductions in GHG emissions required to meet goal	Avoid: New energy policy should prioritize replacement of fossil fuel equipment with electric alternatives wherever possible.

Risk	Mode	Impact	Response
New High-Efficiency Boiler - Efficiency Realization	High efficiencies are only realized during specific operating conditions	LOW: Operational savings required to offset additional cost might not be realized	Mitigate: Ensure that required design modifications are completed to allow boilers to operate at design efficiency. May result in additional capital cost for modifications.
Renewable Natural Gas (RNG) Availability and Cost	RNG is currently fully subscribed and not available for purchase. The cost of RNG is a \$7/GJ premium above that of regular natural gas.	MED: Some RNG in the gas supply will be required if GHG reduction targets aren't met	Avoid: The additional cost of RNG should be considered when evaluating energy efficiency and fuel switching project alternatives to properly price the future cost of fuel.
Deteriorating Performance of Existing Assets	Existing building systems decline in performance over time due to failing equipment and sub-optimal control sequences.	MED: Lowest cost approach to improving energy efficiency and lowering GHG emissions is to make the most of the assets currently in use.	Mitigate: A sustained and substantial increase in effort to optimize existing building systems is required. The role of our Facility Managers and Operators is key in realizing this, as is the new Building Automation Systems Specialist.

Risk	Mode	Impact	Response
Limited Capital	Major investment into retrofits of existing facilities, as well as other measures, will be required to achieve the GHG reduction goal.	HIGH: Capital will always be limited.	<p>Mitigate:</p> <p>Leverage <u>all</u> facilities capital projects to lower energy and GHG emissions by ensuring the most efficient equipment and system designs are adopted. Advocate to the MoH for higher levels of CNCP funding.</p> <p>Explore creation of a Green Revolving Fund</p>



7. Energy Studies & Other Professional Services

Table 5a lists energy studies and other professional services Island Health completed in F2021. Table 5b⁶ shows the projects in development in F2022. Studies have been done on specific opportunities or more specialized initiatives and may also be completed for sites which have not had an energy study in the last three to four years and have a high EUI or high total energy use.

On average, the Energy Department invests about \$200,000 each year on energy studies and other related professional services, such as preliminary design and costing. BC Hydro covers 50% of qualifying energy study costs. FortisBC currently funds 75% of studies that meet specific natural gas reduction criteria. The balance of FortisBC supported study costs are usually refunded after at least some measures have been implemented. The province will also fund studies as part of the CleanBC Plan, which currently pays 50% of study costs (up to a maximum of \$20,000 per study). Energy studies are critical to an energy management program as they provide the details required for sound decision making and enable the strategic prioritization of resources. Energy studies also provide required information for the Carbon Neutral Capital Program (CNCP) funding applications to the Ministry of Health, as well as other funding programs.

⁶ Projects with no cost indicated are either on hold, fully funded by an outside organization, or are being funded through project planning/engineering capital.

Table 5a. Energy Studies & Other Professional Services Completed in F2021

Project Title	Cost
New Studies/Engineering for 2020/21	
Mt. St. Mary's Lighting Study BCH-07034	\$ -
CICHC DHW Heat Pumps CleanBC Lite Workbook	\$ -
YLRS Heat Recovery System CleanBC Custom Workbook	\$ -
NRGH Hydrotherapy AHU Replacement CleanBC Lite Workbook	\$ -
GRH Pneumatic to Electric Controls Upgrade	\$ -
SPH DHW Systems Renewal Study	\$ -
Pulse Energy System- annual licensing fees	\$ 26,624
WCGH Heat Recovery Chiller Deep Dive by Bernie Nelson	\$ 42,365
Green Freight Assessment (GHG reduction potential of CNG conversion of laundry trucks)	\$ 3,000
GRH Window/Door Replacement Study	\$ 12,200
GRH Window/Door Replacement Study: invasive inspection work by LGF	\$ 8,822
QAC Pearkes Boiler and Heat Pump Schem Design & cost/benefits report (BCH-06853)	\$ 31,460
NRGH Kitchen Refrigeration Renewal Options Study (BCH-06542)	\$ 7,500
CDH BC Hydro New Construction Program BCH-06749	\$ 15,000
CDH FortisBC New Construction Program	\$ 25,000
PCC ECM Design, Specifications and Implementation Support	\$ 7,200
C-Op Round II: WCGH Implementation PHASE (design & engineering services) BCH-04910	\$ 4,900
C-Op Round II: WCGH (Standard Recommissioning) COMPLETION PHASE BCH-04910	\$ 4,100
RJH D&T HRC Phase 2&3 energy calculations for CleanBC application BCH-06681	\$ 2,400
NRGH Lab AHU CleanBC Like Workbook BCH-06709	\$ 1,500
NRGH Heat Recovery Coil Additions (OR Exhaust & EF2) - construction support	\$ 2,575
TOTAL Cost	\$ 194,646
Budget, includes extra studies revenue	\$ 215,801
Variance	\$ 21,156

Table 5b. Energy Studies & Other Professional Services Planned or Underway in F2022

Project Title	Cost
New Studies/Engineering for 2021/22	estimates
1119 Pembroke New Thermal Plant Options	\$ 16,000
Pulse Energy System- annual licensing fees	\$ 26,624
GHG Reduction Planning	\$ 100,000
WCGH Chiller Systems Upgrade Support from Bernie Nelson	\$ 9,200
CDHRP Additional Electrification and ZCB TEDI EUI Data	\$ 14,600
Royal Bay LTC Commercial New Construction Studies (CleanBC and FortisBC)	\$ 40,000
TGH Study to Identify Feasible Sites	\$ 6,000
NRGH Thermal Gradient Header - Feasibility Study	\$ 40,000
RJH C-Op Hand-Off COP13-595	\$ 19,950
GRH Envelope Study (balance)	\$ 16,800
NRGH Window/Door Replacement Study (on hold)	\$ 20,000
LMH AHU Renewal - Options Study	\$ 10,000
Endotherm	\$ 5,000
OHC Lighting Study	\$ 5,162
QACC Pearkes Heating Plant Renewal - additional engineering study	\$ -
NRGH Heat Recovery Coil Additions (OR Exhaust & EF2) - construction support	\$ 2,575
committed (in bold)	\$ 98,353
TOTAL Potential	\$ 331,911
Budget	\$ 166,017
Funds Still Available	\$ 67,664

8. Awareness and Behaviour Change (Engagement Plan)

Island Health recognizes the impact employees have on reducing energy consumption and GHG emissions. The Energy Department operates a multi-faceted employee engagement program and partners with and leverages support and resources through BC Hydro's Energy Wise Network and FortisBC's Conservation and Outreach Program.

The engagement program is made up of three main components: webinars, workshops, and quarterly energy review meetings with operators, lead by energy department staff. We have chosen to focus specifically on Facilities Maintenance and Operations (FMO) staff since they have the most direct impact on and ability to reduce energy. Recognizing there are numerous in-house pockets of excellence in highly trained and motivated employees, the Energy Department continues to shed light on and share their best practices across the organization. This includes recognizing and acknowledging who these people are in the Quarterly Energy Management Accountability Reports.

Energy Wise Network Program

BC Hydro and FortisBC co-sponsor the Energy Wise Network (EWN) program with BC Hydro as the facilitator. The EWN program develops strategic behaviour change training and related resources to help participating organizations meet their energy efficiency goals. The EWN facilitates ongoing peer-to-peer learning and one-to-one coaching for Island Health's selected annual project. Island Health has been benefiting from BC Hydro's engagement programs since 2010.

The EWN program focus in F2021 was forced to make a significant shift in program delivery and staff engagement due to the COVID-19 pandemic. This year's focus was on water efficiency and why conserving water is important within healthcare facilities and the sector. Prepared and lead by the Sustainability and Business Continuity Department, the campaign delivered a high-quality educational video and was accompanied by an article featured in the news and events section of the intranet. Detailed within was information on water consumption within healthcare, and tips on how to save water and energy.

<https://player.vimeo.com/video/515936864?quality=720p>

FortisBC Education & Behavior Program

Due to the COVID-19 pandemic, the Island Health energy education and behaviour programs were suspended for the F2021 year. No webinars or in-person workshops were held as FMO staff resources were redeployed elsewhere or worked from home.

In F2022, with FortisBC's support, the Energy Department is developing a Treasure Hunt training program that aims to identify and implement energy savings opportunities at four sites: two in the South Island region, and two in the Center-North. The premise of the treasure hunt – or search for energy efficiency opportunities – is to provide operators with training, best practices, and examples of possible low-cost or no-cost opportunities often found within healthcare facilities.

This training program features an introductory two-hour webinar detailing the purpose and value of the Treasure Hunts, as well as developing tools and a general approach to identifying and assessing opportunities for improvement. Following the webinar, through the fall months, teams will carry out their hunts to identify and log potential opportunities. Through the winter months, the teams will implement changes with support from the Energy Department. The training program concludes with an in-person workshop that focuses on presenting findings, processes utilized to identify opportunities, and general sharing of best practices and available opportunities.



9. Energy Management Assessment (EMA)

The EMA is a biennial stakeholder-based workshop held to comprehensively review Island Health’s energy management program. It has been utilized since 2010. Its purpose is to identify aspects of the program that can be strengthened in order to deliver even higher levels of energy efficiency and conservation. The outcome of the latest workshop and review (held February 6, 2020) was a report with the following five key areas of focus and associated recommendations:

1. Scope and Charter		
Status: In Development	Recommendation: <i>Establish an energy management program charter that can be supported by top management.</i>	
	Action: An energy management program charter to be developed to serve as a guiding document to the energy department as well as other key stakeholders such as Facilities Maintenance and Operations (FMO) and Facilities Design and Construction (FDC). The charter is intended to help operationalize energy management principles within these key stakeholder groups as well as others in Island Health that have an impact on energy use. Charter will include basic guidelines and a checklist for FMO and FDC.	
2. Accountability Structure		
Status: Implemented	Recommendation: <i>Establish an accountability structure for energy performance improvement targets.</i>	
	Action: Prepare and deliver a standardized Quarterly Energy Management Accountability Report to the senior leadership team. These reports and accompanying presentations are utilized to broadcast the energy performance of the entire Island Health portfolio, as well as each individual site to all levels of the organization. Energy Management Accountability Reports provide detailed analysis of financial and energy performance against targets, highlight areas of substantive progress as well as setbacks in the quarter, project updates and goals, and provide organizational context that support the energy management program.	


3. Operational Integration

Status: Complete but requires periodic support	<p>Recommendation: <i>Update standard operating procedures to include energy-efficient operating instructions in areas with significant energy-using equipment.</i></p> <p>Action: Deliver training on how to use the real-time energy monitoring system (Pulse Energy) for daily checking of energy use against baseline. The Pulse real-time monitoring system is being updated to a newer version that will enhance functionality and ease of use. Providing building operators with training on the system enhances their troubleshooting tools and enables them to monitor in real-time, the performance of their systems, including tracking the impact on energy that they have made. Enabling operators to dive deeper into systems performance with reporting/analysis tools, they are better equipped to track performance and progress as related to goals and targets of the energy management program.</p>
Status: Complete/Implemented	<p>Action: Opportunities For Improvement (OFI) meetings have been established at Royal Jubilee Hospital and Nanaimo Regional Generation Hospital, Island Health's two largest sites. OFI meetings provide a time and space for the Energy Department and building operators to identify and document energy savings opportunities, and discuss and agree on action plans to address them. These bi-monthly meetings are meant as "working sessions" where details of opportunities and steps to achieve them are explored and committed to. They ensure a process of continuous improvement is imbedded in the operation, and help ensure performance of energy consuming systems continues to improve. In future, the plan will be to expand these OFI meetings, and the continuous improvement process they foster to other sites.</p>
Status: In Development	<p>Action: Treasure Hunt: A webinar based training session for building operators on how to search for energy saving opportunities will be delivered, and followed up with facilitated half-day hunts in four targeted facilities. The objective will be to find low-cost or no-cost energy saving measures through operational improvements. This Treasure Hunt training aims to facilitate a better understanding of energy-use and savings opportunities in facilities and to engage operating staff in conversations about energy use. The training will end with an in-person half-day workshop in which operators will present the results of what they found during their treasure hunts and what they have been able to implement as a result.</p>
Status: Proposed for 2022/23	<p>Action: As a longer term follow-up to the Treasure Hunt training, it is proposed to standardize regularly scheduled treasure hunts (previously called "energy walkabouts"). An initiative that couples area employees with energy management personnel to walk through facilities together looking for operational improvements, end-user needs or changes. This aims to build an improved understanding of the challenges and successes experienced within the facilities from an operators point of view, and to identify opportunities for collaboration and increased support of common goals.</p>




Status: In Progress	Action: A fossil fuel equipment asset list is to be compiled which will enable the Energy Department to rapidly identify opportunities for GHG reduction through replacement of equipment and apply for applicable financial incentives or rebates.	
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4. Performance Tracking

Status: Complete/Implemente	Recommendation: <i>Provide operating personnel with regular visibility to energy performance and establish troubleshooting protocols that require prompt responses to variations in energy intensity.</i>	
	Action: Reinstate Quarterly FMO Energy Reviews with facility managers and their crews where site-specific energy use performance is reviewed and energy use anomalies are explored and investigated. In addition, these regular reviews are to be used to share energy project status and identify and follow-up on new energy saving project opportunities.	

5. Resource Planning

Status: Complete	Recommendation: <i>Address utilization and capacity constraints across the energy management program for each key resource role.</i>	
	<p>Actions: Lobby for and leverage additional funding made available from BC Hydro and FortisBC for new positions in order to ramp up the capacity and skills of the energy department. Both BC Hydro and FortisBC have developed innovative positions and associated funding models that Island Health can benefit from. With increased support from these utilities, the Energy Department will be able to grow from a team of two (an Energy Manager and Energy Specialist) to a team of five funded and filled positions.</p> <p>The expansion of the team will provide an opportunity to hire based on the team's needs, whether that be a strategic, technical, or highly specialized skillsets. The capacity of the team will significantly increase, which will translate into maximized energy efficiencies, reduced emissions and operating costs, and increased climate-resilient facilities.</p> <p>The team will consist of the following (in order of start date):</p> <ul style="list-style-type: none"> • Joe Ciarniello, Director – Energy & Climate Change [2010] • Bjorn Richt, Thermal Energy Manager [2011] • Jason Orr, Energy Specialist [January, 2021] • Blair McFarlane, Energy Manager [February, 2021] • Justin Blanchfield, Building Automation Systems Specialist [July, 2021] 	

10. Opportunities

Optimize Existing Assets

Recommissioning and Continuous Optimization (C-Op)

Recommissioning and continuous optimization are the highest priority strategies because benefits are achieved without incurring major capital expenses. Energy studies have repeatedly shown that there are significant opportunities to save energy simply by optimizing existing building systems. There is still ample low hanging fruit left to pick, but it takes skilled staff, diligence, and a continuous improvement approach to achieve and sustain results. Funding for a dedicated Building Automation Systems Specialist to ramp up ongoing efforts has now been provided by BC Hydro and FortisBC.

Scheduling & Zoning Upgrades

Island Health provides a wide array of services to patients. Typically, a facility will have some services available 24/7 while other services are offered only Monday to Friday during regular business hours. As a result, much of the space within Island Health's buildings is not occupied all the time. This represents an opportunity to reduce or eliminate ventilation and save substantial amounts of energy. These facilities can therefore benefit from zoning and scheduling retrofits that ensure spaces are only ventilated as needed and when occupied. Zoning breaks out the building into discrete areas with a specific operating schedule, and supplies the right amount of conditioned air only when needed, thus substantially reducing energy consumption. Some spaces, like conference and meeting rooms, are ventilated only when occupancy sensors detect people.

Efficiency & Electrification

Heat Recovery

Heat recovery will continue to be a primary means of reducing energy and GHG emissions in both retrofit and new construction projects. By harvesting waste heat from building exhaust and other sources, such as medical imaging and computer equipment with heat pumps, natural gas consumption and GHG emissions can be substantially lowered.

High Efficiency Heating Plants

Where necessary, Island Health continues to invest in high-efficiency heating plants for space heating and domestic hot water (DHW). High efficiency condensing boilers, coupled or de-coupled

DHW systems, and thermal energy exchange systems (i.e. thermal gradient header) will continue to be investigated and evaluated on a site-by-site basis.

Deep Retrofits

Converting existing high-temperature HVAC systems, present in all but the newest facilities, to lower temperature designs would allow for existing boiler plants to be replaced with air or ground-source heat pumps, for example. Upgrading building envelopes presents another opportunity to lower energy consumption and GHG emissions and can also provide benefit in terms of climate change resiliency by delaying the time it takes for extreme exterior temperatures to impact the indoor environment. Envelope retrofits, however, have limited benefits in acute care facilities where very high outdoor air volumes are required to meet CSA specifications.

New Construction Programs

All new Island Health facility designs strive for the highest levels of patient care at the lowest possible energy use and GHG emissions. It is the department's intent that all new construction and major renovation projects participate in all available new construction incentive funding programs to help ensure the highest levels of performance are achieved.

Benefits of using a collaborative, integrated design process, fostered in part by new construction incentive programs, can be seen in the design of The Summit at Quadra Village long term care facility – the most recently completed project. Island Health, along with all public sector organizations, has been mandated by the provincial government to take steps in new construction to reduce greenhouse gas emissions; this is indicated in the government's original 2008 Climate Action Plan, the 2016 Climate Leadership Plan, and latest CleanBC plan.

Renewables

Solar thermal and **solar photovoltaic (PV)** panels have been installed at several Island Health sites. These systems offset natural gas and purchased electricity but are costly to install. Solar thermal has an unacceptably long payback, as such it is not a viable option at present. These were installed at a time when the provincial government was covering nearly 100% of the capital cost. These incentives no longer exist. Solar PV systems, however, are becoming more attractive, with paybacks currently around 15 years, which continue to improve as system costs decline and BC Hydro rates increase.

Island Health has also spent several years designing and assessing the costs and benefits of installing **biomass boilers** at a number of sites. In spite of a good business case, it has not been possible yet to secure funding for a biomass boiler, in part due to overall financial constraints, as well as increased risk associated with fuel quality and supply. Based on current knowledge, biomass boilers appear to make the most sense at the many off-gas-grid sites where the cost of fossil fuels are 400% higher than for those sites on the gas grid. Smaller sites also present a lower

risk, as such they will be a focus going forward, as biomass is further investigated as a low/no carbon source of fuel.

Renewable natural gas is generated through renewable means and distributed via the FortisBC grid, is a potential source of low carbon fuel for boiler plants. RNG, however, is cost prohibitive at a larger scale with a \$7/GJ premium above that of regular natural gas. Production in BC is limited and supply is currently unavailable.

Water

There is **currently no formal strategy or detailed project plan** that directly addresses water efficiency. As it stands, the best practice, one that is also the most cost effective, is to build a culture of awareness as it relates to the responsible utilization of a natural resource. Building operators are informed of quarterly progress as it pertains to water use at each site, and the implications on the use of water as it impacts the stated KPIs and the associated goals and targets. It is frequently acknowledged that as climate change is increasingly felt on Vancouver Island, water resources are increasingly strained and scarce.

Financial

Green Revolving Fund

The central mechanism of a Green Revolving Fund is an internal loan that funds energy saving projects. The cost savings from these implemented projects are distributed to the Energy Department cost centre, with predetermined percentage of savings being sent back to finance to repay the initial loan. Savings from fund-sourced projects are deposited for the expected life of the project. As more projects are delivering cost savings to the Department, there is eventually enough money to fund another project that delivers energy cost savings. Those savings too are divided up and the cycle continues. This financial mechanism has been utilized by a number of public sector organizations throughout British Columbia and could provide the Energy Department with much needed funds to implement low-carbon and energy cost savings projects.

11. Acknowledging SEMP Stakeholders

The Government of British Columbia

The Government of British Columbia is a leader in promoting a greener economy and one of the first jurisdictions in the world to establish carbon pricing and reduction targets. The Government's Carbon Neutral Capital Program (CNCP) has been providing funding to the BC Health Authorities since F2015 for GHG reduction projects. To date, Island Health has secured nearly \$10 million from the program.

Island Health Executive

Executive leadership is critical to Island Health's success in energy management, meeting organizational carbon reduction targets, and being a provincial leader. We, the Energy Department, thank Island Health's Executive and Board for their relentless support of the Energy Department, access to capital and resources, and the priority given to energy conservation and GHG emissions reduction as evident in the Strategic Framework.

BC Hydro

We thank BC Hydro for providing Island Health with incentive funds that support the Director, Energy and Climate Change, Energy Manager, and Building Automation Systems Specialist positions, as well as, studies, capital projects, the EWN program, and access to their technical experts. These funds are critical to the success of Island Health's energy efficiency and conservation program. Island Health is appreciative of the ongoing training at Energy Manager meetings, workshops, and monthly webinars, as we individually and collectively develop into better stewards of sustainable facilities.

BC Hydro Key Account Manager

Thank you to our dedicated Key Account Manager, Jeff Whitson. Jeff's guidance, leadership, and support extends beyond Island Health, and has a significant impact on energy and carbon management within BC's Healthcare Sector. Jeff's insights and unwavering support to FMO and the Energy Management team is invaluable.

FortisBC

We thank FortisBC for their substantially increased funding commitments as they are now providing to support the Energy Specialist, Thermal Energy Manager, and Building Automation Systems Specialist positions. FortisBC continues to provide funding support for energy studies, capital projects, equipment purchase rebates, and training programs.

FortisBC Key Account Manager

Our appreciation and gratitude also goes to Jennifer Coulthard for continued support and advocacy on behalf of Island Health at FortisBC. Jennifer is always keen to help Island Health navigate all the new programs FortisBC has to offer, and is a strong advocate for our projects and portfolio.

Executive Director Facilities Management

The Energy Management team extends a big thank you to Dean Anderson who brings a progressive vision and focus to the team. The team welcomes Dean's leadership and continued support and looks forward to the many successes in the years to come.

Facilities Maintenance and Operations (FMO)

As best practices in energy management become more embedded in building maintenance, operations and project management, we applaud FMO for their willingness to collaborate and share expertise. FMO provides the insight and resources to successfully implement energy projects while ensuring patients, residents and staff are comfortable and safe. Without their knowledge and support, the Energy Management Program could not exist.

Facilities Design & Construction

The Facilities Design & Construction focuses on design, construction and commissioning of major capital projects, including new buildings and major renovations. FDC have a great deal of influence on the future energy performance of our sites. In particular we thank Jennifer Johnston and Ron Bouveur for their commitment to energy and GHG reduction and excellence in managing the implementation of our projects. We look forward to their continued support and fruitful collaboration.

Capital Planning and Finance

Thank you to Capital Planning and Capital Finance for supporting the Energy Department. These groups are essential to securing and managing capital funds from the Ministry of Health and Regional Hospital Districts (RHDs).

Sustainability & Business Continuity

Behind the scenes, our closest partner in advancing energy efficiency and GHG reduction is of course the Sustainability & Business Continuity Department. Director, Deanna Fourt, Coordinator, Rebecca Wareham and assistant Wendy Furlan-Morgan make exceptional contributions to Island Health through their extensive knowledge, determined support and advocacy, and unwavering passion for sustainable operations. The Sustainability team has provided the Energy Department with the most encouragement of all. The Team thanks all three and looks forward to the continued collaborative partnership.

Island Health Employees

The Energy Department extends their thanks to all Island Health employees. Employees throughout all levels and areas of the complex and interconnected organization have exemplified efficiency through engagement, understanding of best practices, and diligently acting on improving energy efficiency wherever possible. The culture of environmental consciousness and sustainable operations continues to develop. For these reasons, we are seen as community leaders not only in providing health care, but also as stewards of sustainable business practices.



12. Senior Management Approval

By signing below, Island Health's senior management acknowledges receipt and approval of this Strategic Energy Management Plan.

_____, date: _____, 2021

Joe Ciarniello, Director, Energy & Climate Change

_____, date: _____, 2021

Dean Anderson, Executive Director, Facilities Management

_____, date: _____, 2021

Kim Kerrone, Vice President, Support Services and Chief Financial Officer

13. Appendix A – Site Acronyms

Aberdeen Hospital	ABER
Bamfield Outpost Hospital	BAM
Bamfield Outpost Hospital Nurse Residence	BAM-Res
Cairnsmore Place Residential Care	CPRC
Campbell River Hospital	CRH
Chemainus Health Care Centre	CHCC
Comox Valley Hospital	CVH
Cormorant Island Community Health Clinic	CICHC
Cowichan District Hospital	CDH
Cowichan Lodge	CLRC
Cumberland Health Centre	CHC
Cumberland Regional Laundry	CRL
Drug & Alcohol Rehab Society	DARS
Dufferin Place (Extended Care at NRGH)	DPRC
Eagle Park Lodge	EPLTC
Glengarry Hospital	GLEN
Gold River Health Clinic	GRHC
Gorge Road Hospital	GRH
Hillside Seniors Health Centre	HSHC
Lady Minto Hospital	LMH
Ladysmith Community Health Centre	LCHC
Mount Tolmie Hospital	TOLM
Nanaimo Regional General Hospital	NRGH
Nanaimo Wentworth Street	NWWS
Oceanside Health Centre	OHC
Oak Bay Lodge	OBL
Port Alice Health Centre	PAH
Port Hardy Hospital	PHH
Port McNeill Hospital	PMH
Priory Hospital	PRIO
Queen Alexandra Centre - Ledger House	QAC-Ledger
Queen Alexandra Centre - Main/Fisher	QAC-Main
Queen Alexandra Centre - Pearkes	QAC-Pearkes
Royal Jubilee Hospital	RJH
Saanich Peninsula Hospital	SPH
Seven Oaks Tertiary Mental Health Facility	SOMH
Tahsis Health Centre	THC
Tofino General Hospital	TGH
Trillium Lodge	TLLTC

VGH - Victoria Regional Laundry
Victoria General Hospital
Victoria Pandora Avenue Health Centre
West Coast General Hospital
Yucalta Lodge

VGHL
VGH
VPAHC
WCGH
YLRS



14. Appendix B – Climate Change Accountability Policy (August 2021 DRAFT)

Purpose	<p>As required by the Province of British Columbia, Island Health will manage organizational risks that could reasonably be expected to result from a changing climate and minimize adverse environmental effects. In addition, provincial legislation requires Island Health to achieve greenhouse gas (GHG) emissions reduction targets and annual carbon neutrality. (<u>Climate Change Accountability Act</u>). To support the Climate Change Accountability Act the Ministry of Health has updated the Capital Policy Manual to include Chapter 12 Carbon Neutral and Climate Resilient Health.</p> <p>Island Health has identified lack of resilience in response to climate change as a top risk to the organization. If Island Health is unable to adapt to climate change, then business continuity, quality of care, and population health, will suffer. Adapting to climate change is essential for minimizing the disruption to our services and the harm to health and wellness caused by extreme weather events. (Risk Profile 10 GOV: Lack of resilience in response to climate change) Greenhouse gas emissions reduction and climate change resilience are also identified as objectives in Island Health’s <u>Strategic Framework</u> and noted in the Risk Profile.</p> <p>The intended outcome of this policy is to ensure:</p> <ul style="list-style-type: none"> • Carbon neutrality annual requirements, as outlined in the Climate Change Accountability Act, are followed; • Greenhouse gas emissions reduction targets are achieved as defined in the <u>CleanBC Plan</u>; and • The organization addresses climate change resilience in health facilities as per the Climate Change Accountability Act, CleanBC Plan and controls in Island Health’s Risk Profile.
Scope	<p>This policy applies to all functions of the organization and is relevant for all Island Health staff, medical staff, volunteers, students, contractors and others who carry out business for the organization.</p>

1.0 Policy

1. Island Health is required to meet the government-mandated targets for greenhouse gas emissions reduction, as legislated in BC’s Climate Change Accountability Act 6.1. The reductions target means the

2030 total emissions produced for Island Health is 16,500 tCO₂e per year. (Refer to the What Will It Take Report, Climate Change Accountability Report (CCAR) and the Strategic Energy Management Plan (SEMP).)

2. Island Health must achieve Carbon Neutral Government Regulation, and declare carbon neutrality annually by July 1st as per relevant legislation. (Refer to 2018 B.C. Methodological Guidance for Quantifying Greenhouse Gas Emissions and Island Health’s Self Certification Process.)
3. Island Health should minimize its climate impact by reducing greenhouse gas emissions that are out-of-scope in provincial legislation, including emissions from anesthetic gas, business travel, refrigerants, and organic waste.
4. The organization shall address climate change risks in health facilities by assessing risk, implementing controls and monitoring results.

2.0 Monitoring and Evaluation

Island Health will measure and report its emissions reduction efforts and shall participate in annual reporting programs such as the Climate Change Accountability Report (coordinated by Sustainability & Business Continuity Department) as required in the Climate Change Accountability Act, and the Strategic Energy Management Plan (coordinated by Energy Department).

	Responsible Parties	Reporting
Greenhouse gas emissions	<ul style="list-style-type: none"> • Sustainability & Business Continuity Department • Energy Department • Fleet Services • Printing Services 	<ul style="list-style-type: none"> • Climate Change Accountability Report
Facilities climate change risk management	<ul style="list-style-type: none"> • Sustainability & Business Continuity Department • Energy Department • Facilities Design & Construction (FDC) • Capital Planning • Facilities, Maintenance & Operations (FMO) 	<ul style="list-style-type: none"> • Climate Change Accountability Report • Public Sector Climate Risk Management Report

3.0 Definitions

- **Greenhouse gas emissions:** Greenhouse gases include a wide variety of gases that trap heat near the Earth’s surface, slowing its escape into space. Greenhouse gases include carbon dioxide, methane, nitrous oxide and water vapor and other gases.
- **Carbon neutrality:** Carbon neutrality involves measuring operational greenhouse gas emissions, planning and taking action to reduce emissions, offsetting the remainder, demonstrating transparency through annual public reporting of these achievements and being subject to independent verification to ensure completeness and accuracy.

- **Climate change:** A change of climate which is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and which is, in addition to natural climate variability, observed over comparable time periods.
- **Resilience:** In the context of climate change, resilience is the capacity of social, economic and environmental systems to cope with a hazardous event, trend or disturbance, responding or reorganizing in ways that maintain their essential function, identity and structure while also maintaining the capacity for adaptation, learning and transformation.

4.0 Related Island Health Standards

- 8.3.3 Energy Use and Conservation
- Island Health Strategic Framework Objective 3.3
- Risk Profile 10 GOV: Lack of resilience in response to climate change

5.0 References

- Climate Change Accountability Act, Province of British Columbia
- Carbon Neutral Government Regulation, Province of British Columbia
- CleanBC Plan, Province of British Columbia
- 2018 B.C. Methodological Guidance for Quantifying Greenhouse Gas Emissions, Province of British Columbia
- Climate Change Accountability Report (CCAR), Island Health
- Strategic Energy Management Plan (SEMP), Island Health
- “What Will it Take” Report, Island Health
- Self Certification Process Document, Island Health

6.0 Resources

- Climate Change Policy, Legislation & Programs, Province of British Columbia
- Carbon Neutral Government, Province of British Columbia
- Managing Climate Risk for Public Sector Organizations, Province of British Columbia
- Health Care Climate Footprint Report, Health Care Without Harm
- Climate Resilience Guidelines for BC Health Facility Planning & Design, BC Health Authorities
- WHO Guidance for Climate Resilient and Environmentally Sustainable Health Care Facilities, World Health Organization

15. Appendix C – BC Hydro and FortisBC Booked Energy Savings

BC Hydro Booked Energy Savings

Fiscal Year	Booked Savings (MWh)	Cumulative Booked Savings (MWh)	Annual Target Booked Savings (MWh)	Cumulative Sum of Target Savings (MWh)
2007	1,722	1,722	0	0
2008	886	2,608	1,000	1,000
2009	767	3,375	1,000	2,000
2010	3,798	7,173	2,000	3,000
2011	581	7,754	2,000	5,000
2012	1,890	9,644	2,000	7,000
2013	2,750	12,394	1,600	9,000
2014	1,613	14,007	1,200	10,600
2015	1,602	15,609	1,600	11,800
2016	2,280	17,889	1,600	13,400
2017	1,506	19,395	1,300	15,000
2018	5,098	24,493	1,200	16,300
2019	1,392	25,885	1,200	17,500
2020	803	26,688	600	18,100
2021	655	27,343	1,200	19,300
2022*	1,526	28,869	1,200	20,500
2023*	124	30,069	1,200	21,700
2024*	240	31,269	1,200	22,900

*Projected in Multi-Year Plan – based on anticipated credits from BC Hydro for applicable projects listed.

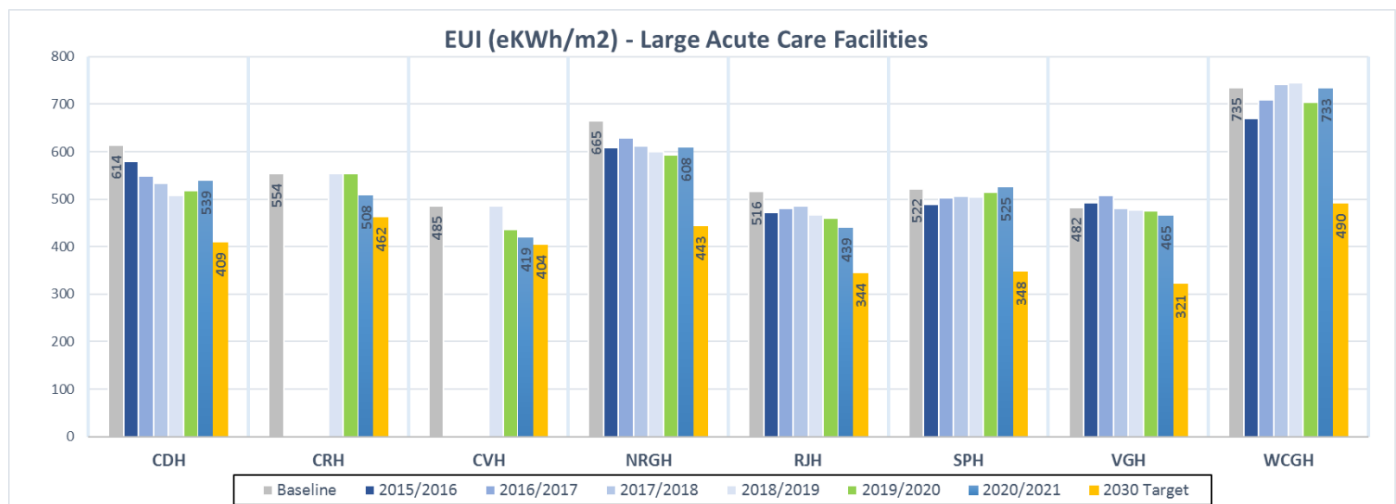
FortisBC Booked Energy Savings

Fiscal Year	Booked Savings (MWh)	Cumulative Booked Savings (MWh)	Annual Target Booked Savings (MWh)	Cumulative Sum of Target Savings (MWh)
2011	2,206	2,206	0	2,206
2012	10,171	12,377	0	12,377
2013	14,221	26,598	0	26,598
2014	11,226	37,824	0	37,824
2015	13,048	50,872	12,000	49,824
2016	18,149	69,021	12,000	61,824
2017	21,055	90,076	12,000	73,824
2018	14,597	104,673	12,000	85,824
2019	11,777	116,450	13,800	99,624
2020	14,005	130,455	13,900	118,624
2021	21,511	151,966	19,000	134,624
2022*	18,222	170,188	19,000	153,624
2023*	10,331	180,519	19,000	172,624
2024*	7,513	199,519	19,000	191,624

*Projected in Multi-Year Plan – based on anticipated credit from FortisBC for applicable projects listed.

16. Appendix D – Individual Facilities Benchmarks

Large Acute Care

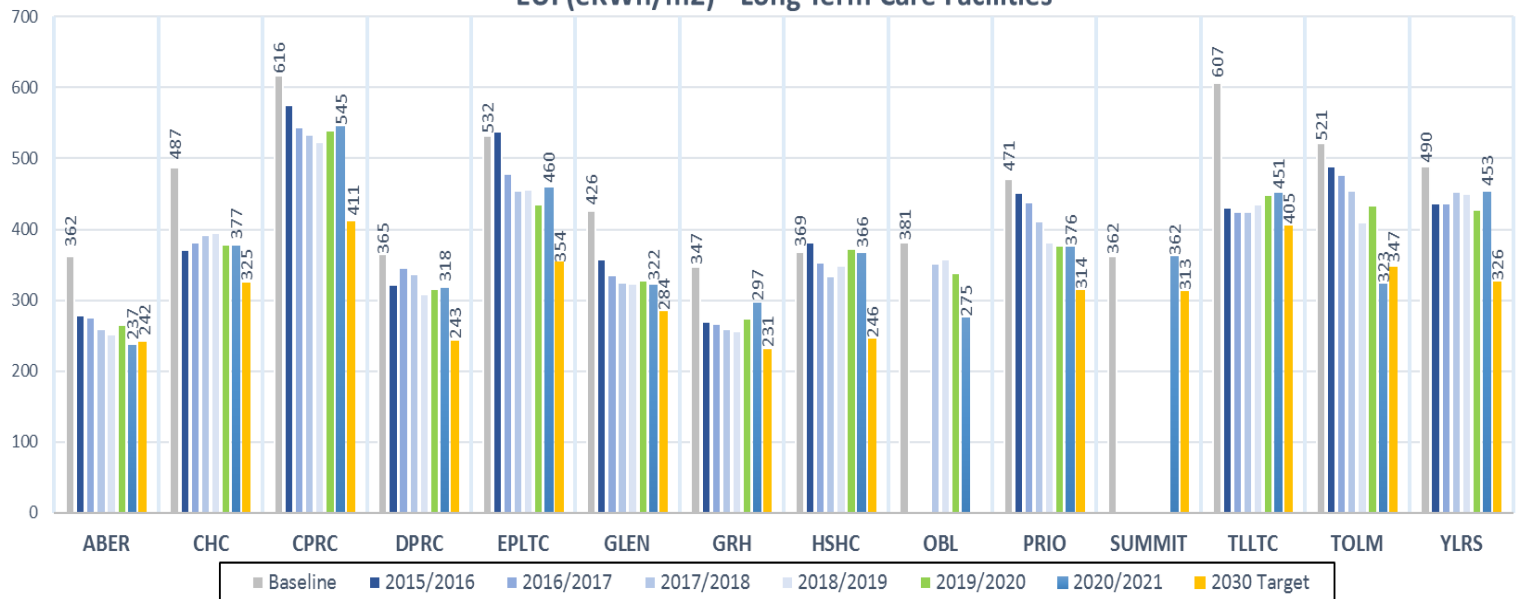


Large Acute Care for F2021

Facility	Floor Area [m ²]	Electricity [kWh]	Fossil Fuel [kWh]	Total EUI [kWh/m ²]	Total CI [\$/m ²]	Emissions [tCO ₂ e]
CDH	16,498	3,371,400	5,513,696	539	\$27	1,026
CRH	31,905	11,581,920	4,641,219	508	\$35	957
CVH	39,029	12,909,600	3,424,611	419	\$30	753
NRGH	54,441	13,796,877	19,324,399	608	\$30	3,616
RJH	155,304	26,552,037	41,630,290	439	\$21	7,756
SPH	14,647	3,493,345	4,193,470	525	\$29	790
VGH	49,554	9,034,832	13,990,094	465	\$23	2,608
WCGH	14,117	4,032,722	6,312,469	733	\$37	1,176

Long Term Care

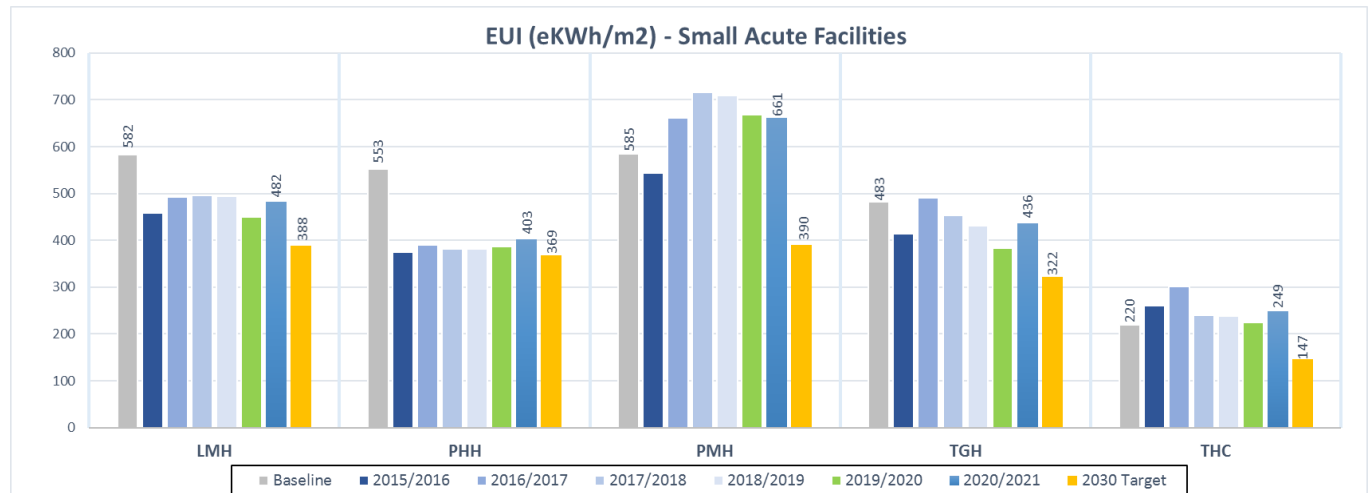
EUI (eKWh/m²) - Long Term Care Facilities



Long Term Care Facilities for F2021

Facility	Floor Area [m ²]	Electricity [kWh]	Fossil Fuel [kWh]	Total EUI [kWh/m ²]	Total CI [\$ /m ²]	Emissions [tCO ₂ e]
ABER	9,726	1,054,955	1,247,034	237	\$14	235
CHC	5,328	772,309	1,237,008	377	\$21	230
CPRC	4,230	734,160	1,571,212	545	\$30	290
DPRC	6,928	693,614	1,509,345	318	\$16	278
EPLTC	4,000	492,872	1,345,512	460	\$23	247
GLEN	7,609	807,247	1,643,671	322	\$16	304
GRH	17,517	1,092,000	4,106,736	297	\$13	749
HSHC	1,600	269,895	316,220	366	\$25	60
OBL	3,585	304,657	682,019	275	\$13	126
PRIO	7,149	813,423	1,871,768	376	\$21	345
SUMMIT	20,315	3,824,460	3,530,194	362	\$21	675
TLLTC	4,651	1,971,529	128,094	451	\$25	44
TOLM	2,629	124,156	725,178	323	\$15	132
YLRS	5,467	767,904	1,708,199	453	\$22	315

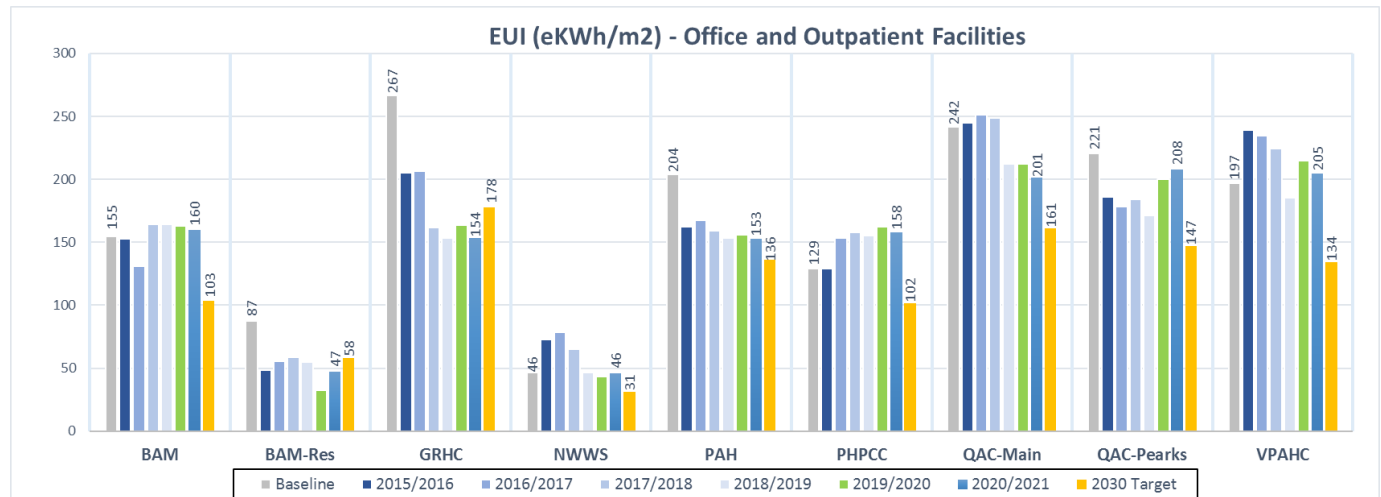
Small Acute Care



Small Acute Care for F2021

Facility	Floor Area [m ²]	Electricity [kWh]	Fossil Fuel [kWh]	Total EUI [kWh/m ²]	Total CI [\$ /m ²]	Emissions [tCO ₂ e]
LMH	3,981	711,807	1,206,059	482	\$61	269
PHH	4,463	1,689,234	107,842	403	\$26	46
PMH	1,176	376,580	401,342	661	\$87	91
TGH	1,700	316,883	424,758	436	\$46	114
THC	381	94,927	0	249	\$32	1

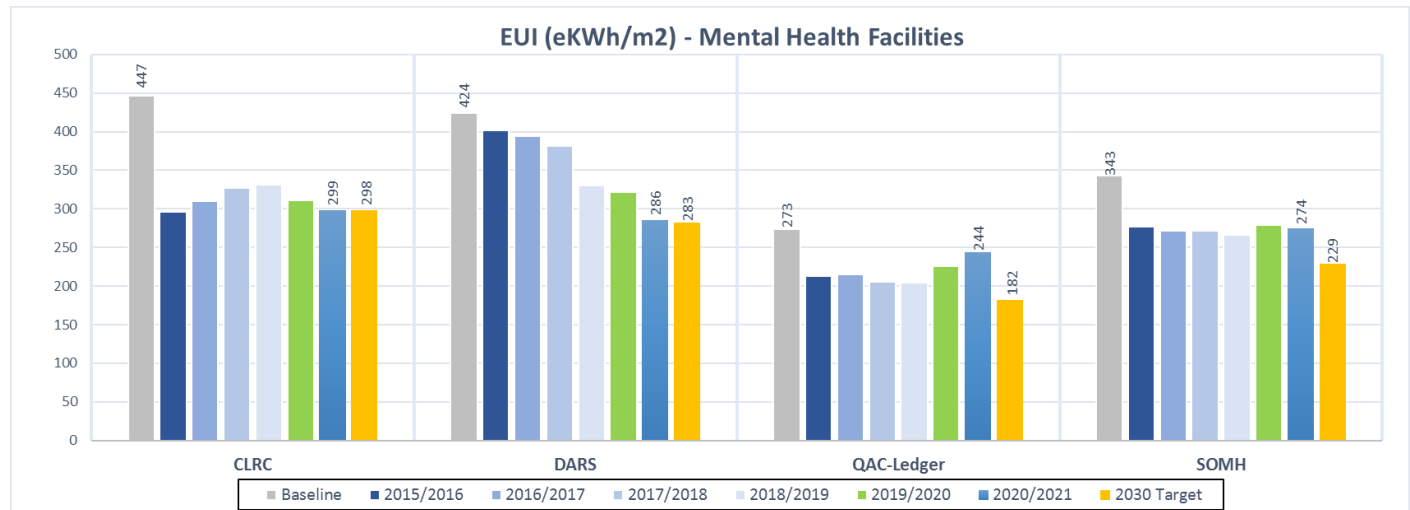
Office/Outpatient Facilities



Office/Outpatient F2021

Facility	Floor Area [m ²]	Electricity [kWh]	Fossil Fuel [kWh]	Total EUI [kWh/m ²]	Total CI [\$ /m ²]	Emissions [tCO ₂ e]
BAM	700	85,839	26,056	160	\$22	7
BAM-Res	279	13,172	0	47	\$5	0
GRHC	799	122,675	0	154	\$19	1
NWWS	1,858	82,579	2,345	46	\$6	1
PAH	468	71,577	0	153	\$18	1
PHPCC	475	75,056	0	158	\$19	1
QAC-Main	8,909	763,690	1,028,353	201	\$12	193
QAC-Pearks	3,905	227,875	584,335	208	\$12	107
VPAHC	1,181	133,620	108,053	205	\$17	21

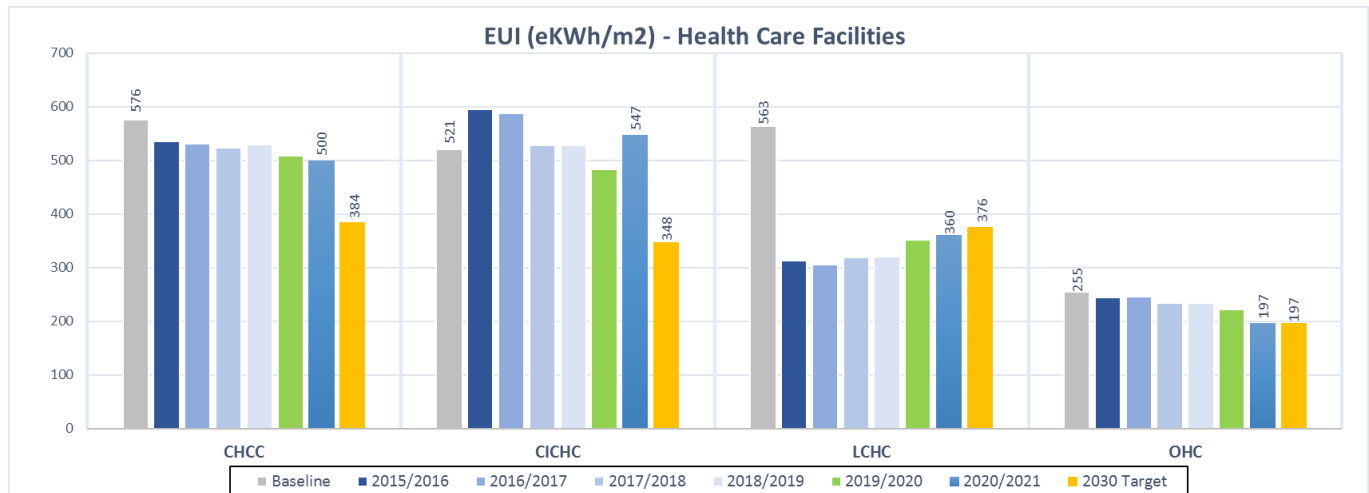
Mental Health



Mental Health F2021

Facility	Floor Area [m ²]	Electricity [kWh]	Fossil Fuel [kWh]	Total EUI [kWh/m ²]	Total CI [\$ /m ²]	Emissions [tCO ₂ e]
CLRC	5,440	606,044	1,018,918	299	\$17	189
DARS	1,733	137,381	357,439	286	\$17	66
QAC-Ledger	2,772	235,254	441,914	244	\$15	82
SOMH	3,497	372,906	586,339	274	\$18	109

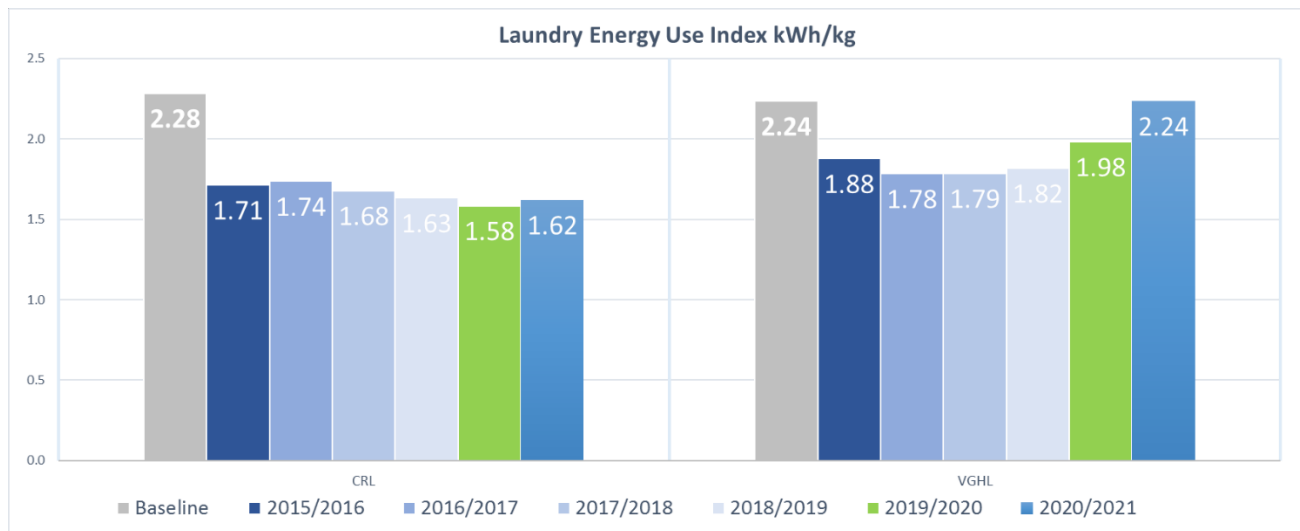
Health Centres



Health Centre F2021

Facility	Floor Area [m ²]	Electricity [kWh]	Fossil Fuel [kWh]	Total EUI [kWh/m ²]	Total CI [\$ /m ²]	Emissions [tCO ₂ e]
CHCC	5,116	850,720	1,709,396	500	\$26	316
CICH	2,129	439,873	725,639	547	\$76	162
LCHC	3,348	426,835	778,852	360	\$22	144
OHC	3,638	508,420	206,540	197	\$15	43

Laundry Facilities



Laundry Facilities F2021

Facility	Laundry Processed [kg]	Electricity [kWh]	Fossil Fuel [kWh]	Total LUI [kWh/kg]	Total CI [\$ /m ²]
CRL	3,312,381	555,984	4,868,992	1.62	880
VGHL	5,518,984	1,941,300	10,429,726	2.24	1893

Note: Laundry facility data is not weather adjusted.

17. Appendix E – Health Capital Policy Manual

Health Capital Policy Manual

Policy Name: Carbon Neutral and Climate Resilient Health Care Facilities	
Chapter: 12	Effective Date: February 22, 2021

1. Objective

To align health facility planning and design with Government climate legislation, action plans and strategies for minimizing greenhouse gas emissions (GHG) and managing climate risks.

2. Scope

This policy applies to health authorities and their new and replacement construction projects.

3. Context

The Province has set aggressive targets and timelines for GHG emissions reduction.

The *Climate Change Accountability Act* established targets to reduce BC's GHG emissions below 2007 levels by at least 40% by 2030, 60% by 2040 and 80% by 2050.

In December 2018, CleanBC was released. This plan includes actions and goals for British Columbians to build a cleaner future and reduce pollution from energy and waste, become more efficient, use less energy and waste less, while reducing GHG emissions and making sure that the energy used is *clean* and renewable. It is expected that public sector buildings will lead the way in reducing emissions by 50% by 2030, to achieve the overall reduction of emissions from all buildings by 40% by 2030.

In December 2020, the health authorities issued the *Climate Resilience Guidelines for BC Health Facility Planning & Design* (the *Resilience Guidelines*). This resource is intended to provide a roadmap to BC health authorities, planning and design teams, and other health system stakeholders to proactively identify, reduce and manage climate change risks (i.e. climate change adaptation) and to enhance health care facility resilience.

Climate resilient health care facilities are able to anticipate, respond to, cope with, recover from and adapt to climate-related shocks and stresses to bring ongoing and sustained health care to their target populations, despite a changing climate.

4. Requirements

Health authorities are required to minimize GHG emissions and to reduce climate risks as follows:

1. Identify and evaluate a reasonable number of design options that will lead to lower GHG emissions from equipment, technology and building systems. Include in applicable business plans an assessment of options to reduce GHG emissions relative to a baseline of LEED Gold by adopting energy efficiency measures and installing low carbon heating and cooling systems that meet operational requirements under local conditions, with the goal of aligning with CleanBC net zero energy efficiency strategies for buildings.
2. Undertake energy modelling including GHG emissions calculations to quantify the potential GHG reduction in each design option by using whole-building energy modelling software or other methods for calculations, depending on the size and complexity of the project. Energy modelling should use future shifted weather files that span asset and facility lifecycles to establish design baselines and future design temperatures. The design selected for implementation is to maximize GHG emissions reduction and satisfy other project requirements while staying within the financial framework of the project.
3. Use climate hazard exposure screens (see the Resilience Guidelines) to identify facility projects that require adaptation to address future climate changes and risks and include their summary in master plans.
4. Require design teams to carry out a climate risk assessment to inform development of business plans and project procurement documents (i.e. Statements of Requirements, Requests for Qualifications, and Requests for Proposals).
5. Structure the procurement process to require proponents to carry out a resilient design review and/or a climate risk assessment to validate and expand on resilient design strategies.
6. Require successful proponents to submit a completed climate resilience compliance audit report.
7. Integrate Greening Strategies for Co-benefits to achieve health and climate resilience co-benefits.

5. Definitions

Resilience: in the context of climate change is the capacity of social, economic and environmental systems to cope with a hazardous event, trend or disturbance, responding or reorganizing in ways that maintain their essential function, identity and structure while also maintaining the capacity for adaptation, learning and transformation.

Resilience of project design: the extent to which a project's assets have considered climate risks in their design (e.g. incorporating appropriate adaptation measures as well as accounting for climate risks in the economic and financial analysis demonstrating the viability and value of the project).

End of report.