



Energy Conservation & Demand Management Plan 2024

Health Sciences North
Horizon Santé-Nord
www.hsnsudbury.ca
O. Reg. 25/23
2024-2029



Health Sciences North
Horizon Santé-Nord

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Executive Summary

The following “Energy Conservation and Demand Management Plan” is written in accordance with O. Reg. 25/23 of the recently amended Electricity act, 1998.

Energy management initiatives can produce environmental, economic, and social benefits, including reducing greenhouse gas (GHG) emissions, cost avoidance and increasing savings. As concerns surrounding energy availability and cost continue to rise, an energy management plan is a proactive step toward an effective long-term solution. Along with these benefits, energy efficiencies also promote local economic development opportunities, energy system reliability, and reduced-price volatility. Our energy efficient capital and operating process improvements are key components to our success and will be outlined in our report. The Health Sciences North community is committed to the path of sustainability, in all aspects of our health care facility.

Goals and Objectives

Our mission is to improve the health of northerners. We recognize the critical relationship between environmental health and public health, and we aim to limit any impact upon the environment resulting from the operation of our health care facilities. Implementing a strategic energy management plan will address the interconnected issues of indoor environmental quality, energy use, and facility operations. Our goal is to continuously monitor our current practices, so that optimal operating efficiency can be reached, and resources can be allocated more appropriately to serve our community.

Our Mission

Improve the health of northerners by working with our partners to advance quality care, education, research and health promotion.



1. Regulation Overview

O. Reg. 397/11: Conservation and Demand Management Plans was introduced in 2013. Under this regulation, public agencies were required to report on energy consumption and greenhouse gas (GHG) emissions and develop Conservation and Demand Management (CDM) plans the following year.

Until recently, O. Reg. 397/11 was housed under the Green Energy Act, 2009 (GEA). On December 7, 2018, the Ontario government passed Bill 34, Green Energy Repeal Act, 2018. The Bill repealed the GEA and all its underlying Regulations, including O. Reg. 397/11. However, it re-enacted various provisions of the GEA under the Electricity Act, 1998.

As a result, the conservation and energy efficiency initiatives, namely CDM plans and broader public sector energy reporting, were re-introduced as amendments to the Electricity Act. The new regulation is now called O. Reg. 507/18: Broader Public Sector: Energy Conservation and Demand Management Plans (ECDM).

As of January 1, 2019, O. Reg. 397/11 was replaced by O. Reg. 507/18, and BPS reporting and ECDM plans are under the Electricity Act, 1998 rather than the Green Energy Act, 2009.

As of February 23, 2023, O. Reg. 507/18 was replaced by O. Reg. 25/23, and BPS reporting and ECDM Plans are under the Electricity Act, 1998 rather than the Green Energy Act, 2009.



2. Introduction

The purpose of Health Sciences North's energy management plan is to promote sustainable stewardship of our environment and community resources.

In keeping with our core values of excellence and accountability, Health Sciences North's (HSN) energy management program will aim to reduce operating costs while enabling us to provide innovative patient-centered care to a greater number of persons in the community. The plan will also meet the requirements outlined in O. Reg. 25/23 of the recently amended Electricity Act, 1998. To obtain full value from energy management activities, and to strengthen our conservation initiatives, a strategic approach will be taken. Our organization will strive to fully integrate energy management into our practices by considering indoor environmental quality, operational efficiency, and sustainably sourced resources into major financial decision-making.

Our Purpose

To provide high quality health services, support learning, and generate research that improves health outcomes for the people of Northeastern Ontario.

Respect. Quality. Transparency. Accountability. Compassion.



3. Health Sciences North by the Numbers

We are the regional tertiary care center for 23 other hospitals in Northeastern Ontario, with:

- 4,631 dedicated and resilient employees
- 579 highly skilled medical staff
- 2,900 learner placements
- 400 active volunteers
- 14 sites in Greater Sudbury and an additional 17 sites across Northeastern Ontario

HSN is recognized as a high-performing hospital, “Accredited with Exemplary Standing” from Accreditation Canada, the highest rating that a hospital can achieve. A leading academic health sciences centre in Canada, HSN is also recognized by Research Infosource as one of Canada’s Top 40 Research Hospitals. HSN’s regional cancer program continues to rank as top in the province, and the Addictions Medicine Unit received national recognition and an award for its care model. Our patient experience survey results are above the Ontario teaching hospital averages on most indicators.



Picture 1 Ramsey Lake Health Centre



4. Building Survey

Health Sciences North (HSN) consists of three health care facilities that have each been audited for sustainability. Health Sciences North is a network of integrated facilities and programs serving the communities of northeastern Ontario in health promotion, prevention, diagnosis, treatment, research and patient care. Each facility provides a unique component of health care services to the Northeastern Ontario community. The chart below provides a brief site description of each facility.

Table 1. Summary of Facilities

Health Sciences North	
Type of Facility: Healthcare Services	
Total Number of Buildings being Audited: 3	
Facility #1	
Facility Name	Ramsey Lake Health Centre
Address	41 Ramsey Lake Rd., Sudbury, ON
Gross Area (ft ²)	1,046,298
Number of Floors	Facility is comprised of five distinct but connected buildings ranging from single floor to 14-story
Facility Use	The facility provides both acute and chronic patient care
Facility #2	
Facility Name	Sudbury Outpatient Centre
Address	865 Regent St. Sudbury, ON
Gross Area (ft. ²)	185,000
Number of Floors	6
Facility Use	Outpatient Clinics
Facility #3	
Facility Name	Mental Health & Addictions Centre
Address	680 Kirkwood Sudbury, ON
Gross Area (ft. ²)	96,862
Number of Floors	Facility is comprised of several separate buildings that are of single-floor construction and a five-story main building.
Facility Use	The facility provides acute and chronic patient care. (Mental Health) (Owned by North Bay Regional Health Center)



5. Energy Consumption

Energy, in cost and resource stewardship is a significant public policy issue. Hospital facilities are among the most energy intensive buildings in the public sector. Hospitals can substantially reduce energy costs while maintaining or improving the quality of patient care. Knowing where your facility stands in comparison to other buildings in the industry can provide insight into opportunities for improvement. Once a baseline is established, management can decide which energy efficient measures will best suit the needs of their facility.

5.1. Energy Consumption

Current utilities supplied for all our facilities consist of natural gas, electricity, and water. Utility consumption for each respective utility has been adjusted to fit a regular calendar year (365 days). Water consumption has been included below but excluded from further analysis.

Table 2. Historic Energy Intensity and Water Consumption

Ramsey Lake Health Centre					
	2019	2020	2021	2022	2023
Energy Intensity (ekWh/sq. ft)	66.7	65.1	65.6	68.7	64.2
Water (m ³)	204,159	178,841	191,661	206,590	210,830
Sudbury Outpatient Centre					
	2019	2020	2021	2022	2023
Energy Intensity (ekWh/sq. ft)	41.2	36.8	37.4	39.7	35.4
Water (m ³)	17,152	15,234	16,822	15,426	15,781
Mental Health & Addictions Centre					
	2019	2020	2021	2022	2023
Energy Intensity (ekWh/sq. ft)	37.1	33.2	32.4	33.5	37.0
Water (m ³)	7,286	8,790	4,791	7,511	5,619



6. Utility Consumption

6.1. Ramsey Lake Health Centre

Current utilities supplied for Ramsey Lake Health Centre consist of natural gas, electricity, and water. Utility consumption for each respective utility has been adjusted to fit a regular calendar year (365 days).

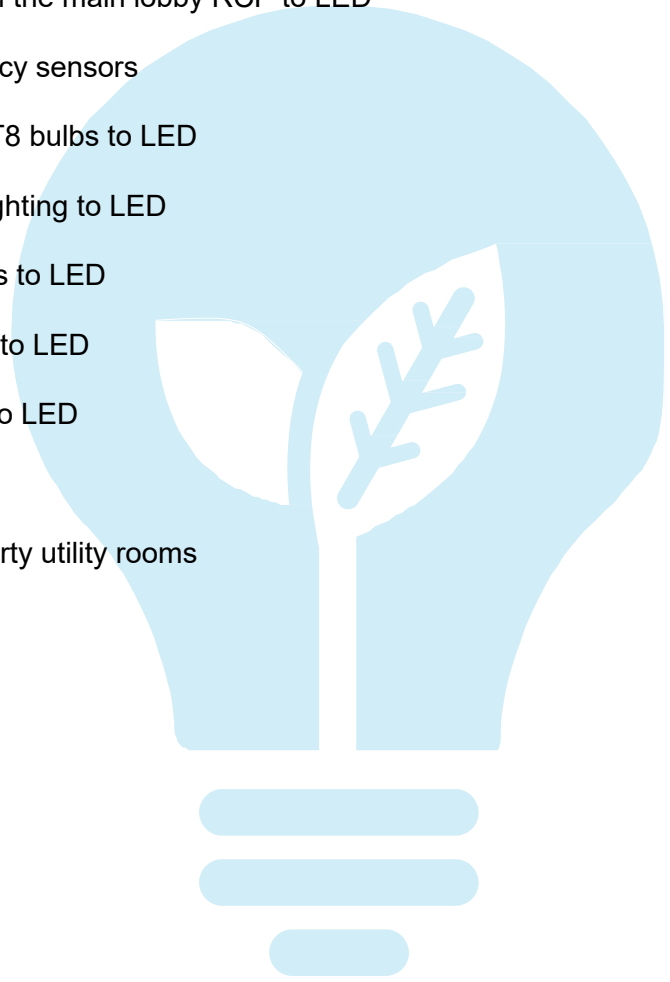
Table 3. Historic Utility and Energy Consumption for Ramsey Lake Health Centre

Utility Source	Annual Consumption (units)				
	2019	2020	2021	2022	2023
Electricity (kWh)	24,333,583	24,765,344	25,803,587	25,180,265	24,634,439
Co-Gen (kWh)	0	0	0	0	0
Electricity (Total)	24,333,583	24,765,344	25,803,587	25,180,265	24,634,439
Natural Gas (m ³)	4,200,882	4,030,241	4,028,452	4,446,798	4,102,332
NG-Steam Production (m ³)	58,584	52,640	38,491	29,326	16,878
NG-Hot Water Production (m ³)	71,436	39,840	82,013	43,457	2,165
Natural Gas (Total)	4,330,902	4,122,721	4,148,956	4,519,581	4,121,375
Water (m ³)	204,159	178,841	191,661	206,590	210,830



Energy Initiatives Completed at the Ramsey Lake Health Centre in the past few years:

- Installation of VFD on AHU serving Kitchen
- Installation of 5-star energy efficient filters
- Replacement of ED and main canopy lighting to LED
- Replacement of exit signs to running man – RCP & Lodge
- Replacement of exit signs to running man – CTC
- VFD installation phase III
- VFD installation phase II
- Replacement of pendant lighting in the main lobby RCP to LED
- Level 7 mechanical room occupancy sensors
- Replacement of 25,000 standard T8 bulbs to LED
- Replacement of exterior canopy lighting to LED
- Replacement of exterior wall packs to LED
- Converted exterior bollard lighting to LED
- Exterior parking lighting changed to LED
- Installation of steam sub-metering
- Occupancy sensors in the clean/dirty utility rooms





6.2. Sudbury Outpatient Centre

Current utilities supplied for the Sudbury Outpatient Centre consists of natural gas, electricity, and water. Utility consumption for each respective utility has been adjusted to fit a regular calendar year (365 days).

Table 4. Historic Utility Consumption for Sudbury Outpatient Centre

Utility Source	Annual Consumption (units)				
	2019	2020	2021	2022	2023
Electricity (kWh)	1,815,475	1,809,411	1,909,042	1,798,694	1,766,027
Natural Gas (m ³)	561,951	484,488	485,409	536,929	463,782
Water (m ³)	17,152	15,234	16,822	15,426	15,781

Energy Initiatives Completed at the Sudbury Outpatient Centre in the past few years:

- SOC building automation upgrades
- Replacement of lobby lighting to LED
- Exterior lighting replaced with LED
- Replacement of stairwell lighting to LED
- Replacement of 2500 T8's to LED
- Installation of new energy efficient AHU's
- Roof replacement(s)
- Upgrades of DDC controls for fan scheduling
- Lighting culture programs



6.3. Mental Health and Addiction Centre

Current utilities supplied for the Mental Health and Addiction Centre consists of natural gas, electricity, and water. Utility consumption for each respective utility has been adjusted to fit a regular calendar year (365 days).

Table 5. Historic Utility Consumption for Mental Health & Addiction Centre

Utility Source	Annual Consumption (units)				
	2019	2020	2021	2022	2023
Electricity (kWh)	1,015,218	1,039,673	1,118,073	1,010,797	1,107,108
Natural Gas (m ³)	249,723	210,997	195,143	215,846	239,511
Water (m ³)	7,286	8,790	4,791	7,511	5,619

Energy Initiatives Completed at the Mental Health and Addiction Centre in the past few years:

- BAS Upgrades
- Replacement of the elevators
- Replacement of the cottage's boilers
- Replacement of the cottages hot water tanks
- Replacement of Cottage II RTU's
- Installation of 5-star energy efficient filters
- Replacement of 1500 T8's to LED
- Culture programs



7. End Use – Energy

7.1. Ramsey Lake Health Centre

The following information outlines estimates of energy consumption in accordance with Natural Resources Canada Office of Energy Efficiency:

Table 6. End Use Energy Summary for Ramsey Lake Health Centre

End Use – Energy Annual Energy (%)	
Lighting	4%
Fans	11%
Pumps	3%
Central Cooling Coils	6%
Miscellaneous Loads	12%
Central Heating Coils	11%
Space Heating	7%
Children’s Treatment Centre	1%
Reheat or Hot Deck Coils	14%
Cooling Tower	1%
Domestic Hot Water	2%
Humidifiers	9%
Helipad	1%
Sterilizers	16%
Losses	2%
Total	100%

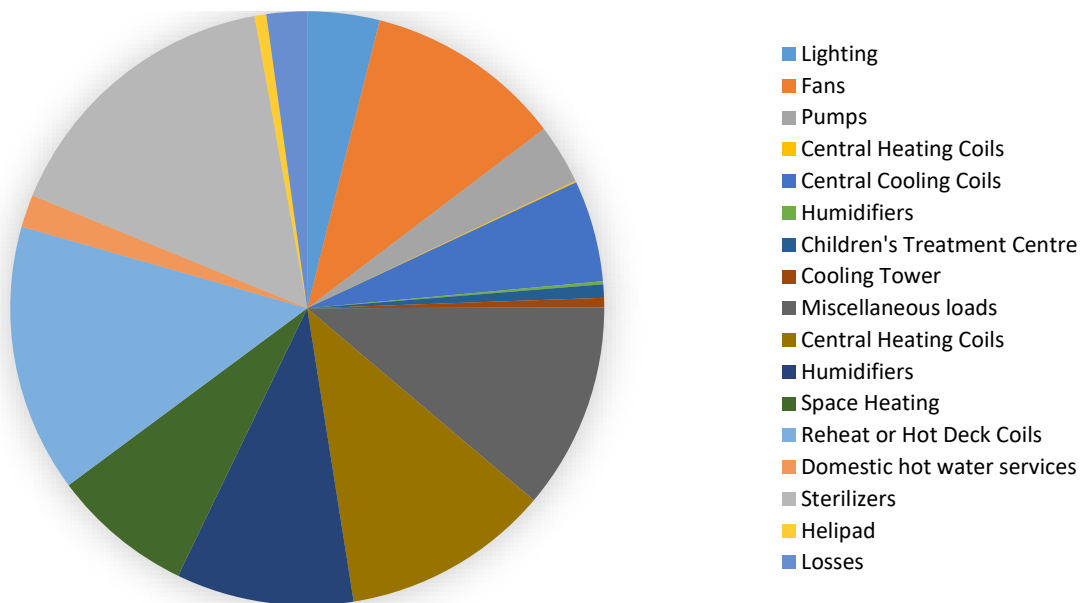


Figure 1. End Use Energy Summary for Ramsey Lake Health Centre



7.2. Sudbury Outpatient Centre

The following information outlines estimates of energy consumption for the Sudbury Outpatient Centre in accordance with Natural Resources Canada Office of Energy Efficiency:

Table 7. End Use Energy Summary for Sudbury Outpatient Centre

End Use – Energy Annual Energy (%)	
Space Heating	34%
Space Cooling	4%
Water Heating	44%
Plug Load	3%
*Aux. Equipment	0%
Aux. Motors	6%
Lighting	7%
Servers	2%
Totals	100%

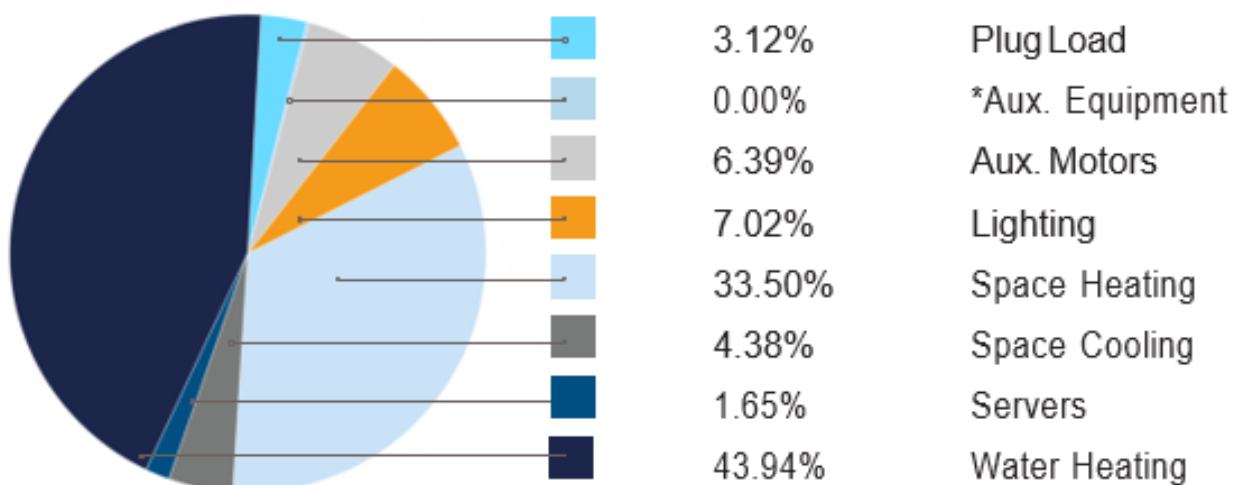


Figure 2. End Use Energy Summary for Sudbury Outpatient Centre



7.3. Mental Health & Addictions Centre

The following information outlines estimates of energy consumption for the Mental Health & Addictions Centre in accordance with Natural Resources Canada Office of Energy Efficiency:

Table 8. End Use Energy Summary for Mental Health & Addictions Centre

End Use – Energy Annual Energy (%)	
Space Heating	56%
Space Cooling	7%
Water Heating	8%
Plug Load	4%
*Aux. Equipment	1%
Aux. Motors	15%
Lighting	6%
Servers	3%
Totals	100%

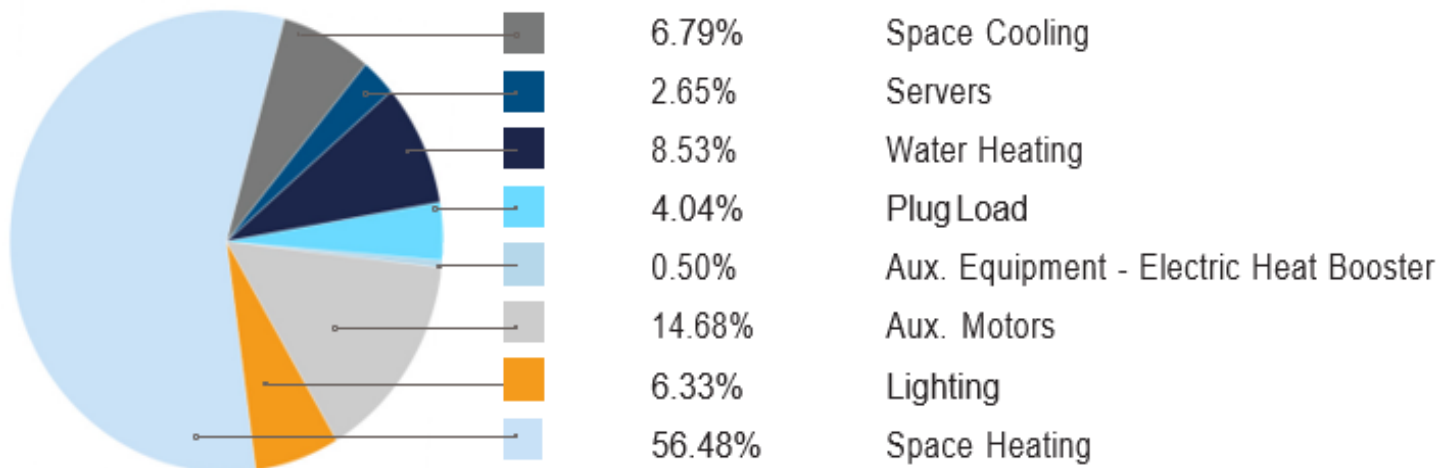


Figure 3. End Use Energy Summary for Mental Health & Addictions Centre



8. Energy Utilization Index

Energy Utilization Index is a measure of how much energy a facility uses per square foot.

Breaking down a facility’s energy consumption on a per-square-foot-basis allows facilities of different sizes to be compared with ease.

Table 9. Historic Energy Use Intensity

Facility	Annual Consumption (units)				
	2019	2020	2021	2022	2023
Ramsey Lake Health Centre	66.7	65.1	65.6	68.7	64.2
Sudbury Outpatient Centre	41.2	36.8	37.4	39.7	35.4
Mental Health & Addiction Centre	37.1	33.2	32.4	33.5	37.0

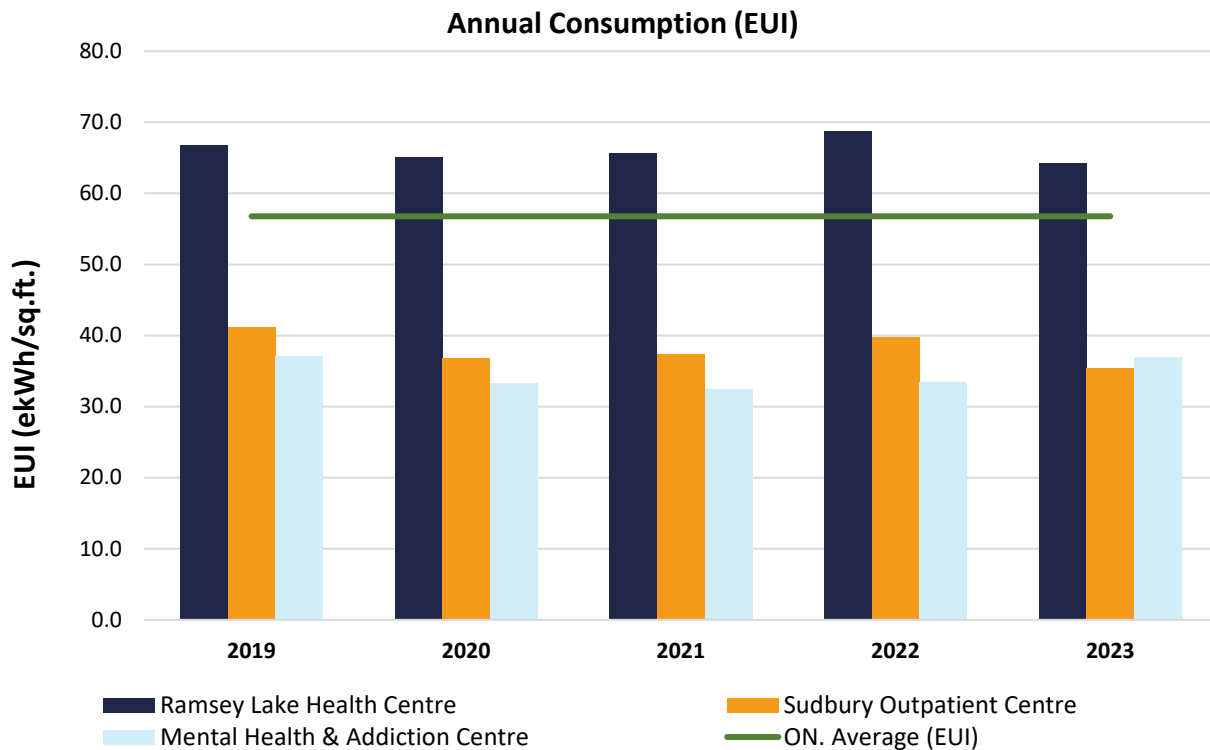


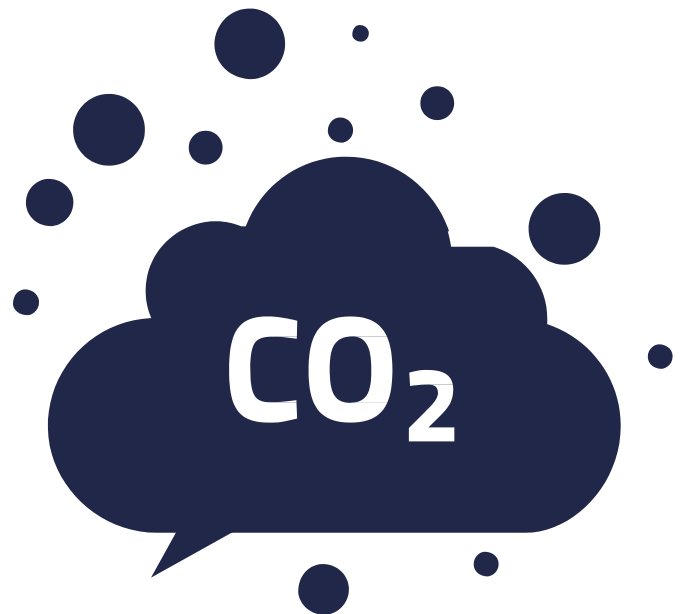
Figure 4. Historic Energy Use Intensity



9. Green House Gas Emissions

Greenhouse Gas (GHG) emissions are expressed in terms of equivalent tons of Carbon Dioxide. The GHG emissions associated with a facility are dependent on the fuel source—hydroelectricity produces fewer greenhouse gases than coal-fired plants, or light fuel oil produces fewer GHGs than heavy.

Electricity from the grid in Ontario is relatively “clean”, as the majority is derived from low-GHG nuclear power and hydroelectricity, and coal-fired plants have been phased out. Natural Gas and Electricity consumptions have been converted to their equivalent tons of greenhouse gas emissions in the tables below.





9.1. Ramsey Lake Health Centre

The GHG emissions are calculated based on the energy consumption data analyzed, as follows.

Table 10. Historic GHG Emissions for Ramsey Lake Health Centre

	GHG Emissions (tCO ₂ e)				
	2019	2020	2021	2022	2023
Electricity (scope 2)	608	639	676	1,778	2,040
Natural Gas (scope 1)	8,320	7,920	7,970	8,682	7,917
Totals	8,928	8,559	8,646	10,460	9,957

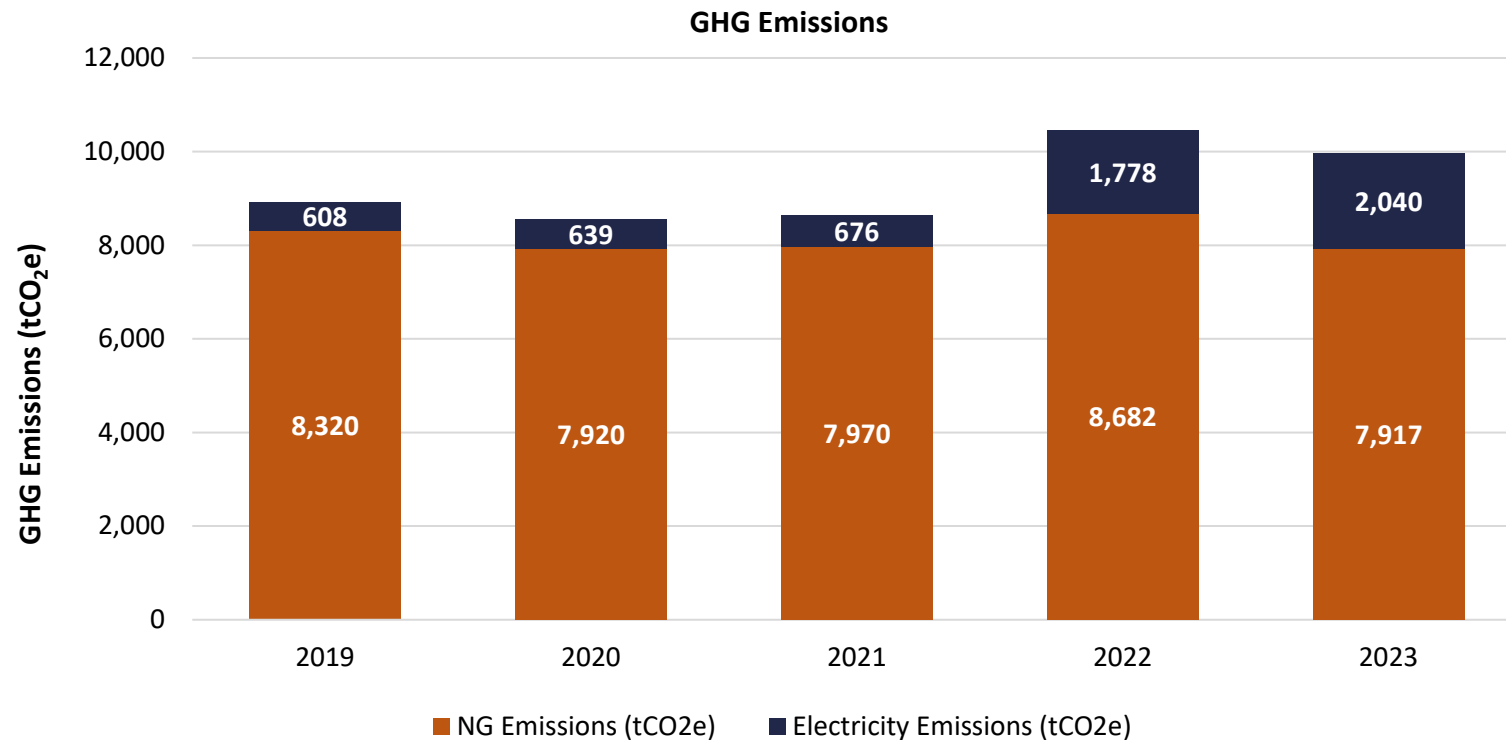


Figure 5. Historic GHG Emissions for Ramsey Lake Hospital



9.2. Sudbury Outpatient Centre

The greenhouse gas emissions are calculated based on the energy consumption data analyzed.

Table 11. Historic GHG Emissions for Sudbury Outpatient Centre

	GHG Emissions (tCO ₂ e)				
	2019	2020	2021	2022	2023
Electricity (scope 2)	45	47	50	127	146
Natural Gas (scope 1)	1,080	931	932	1,031	891
Totals	1,125	977	982	1,158	1,037

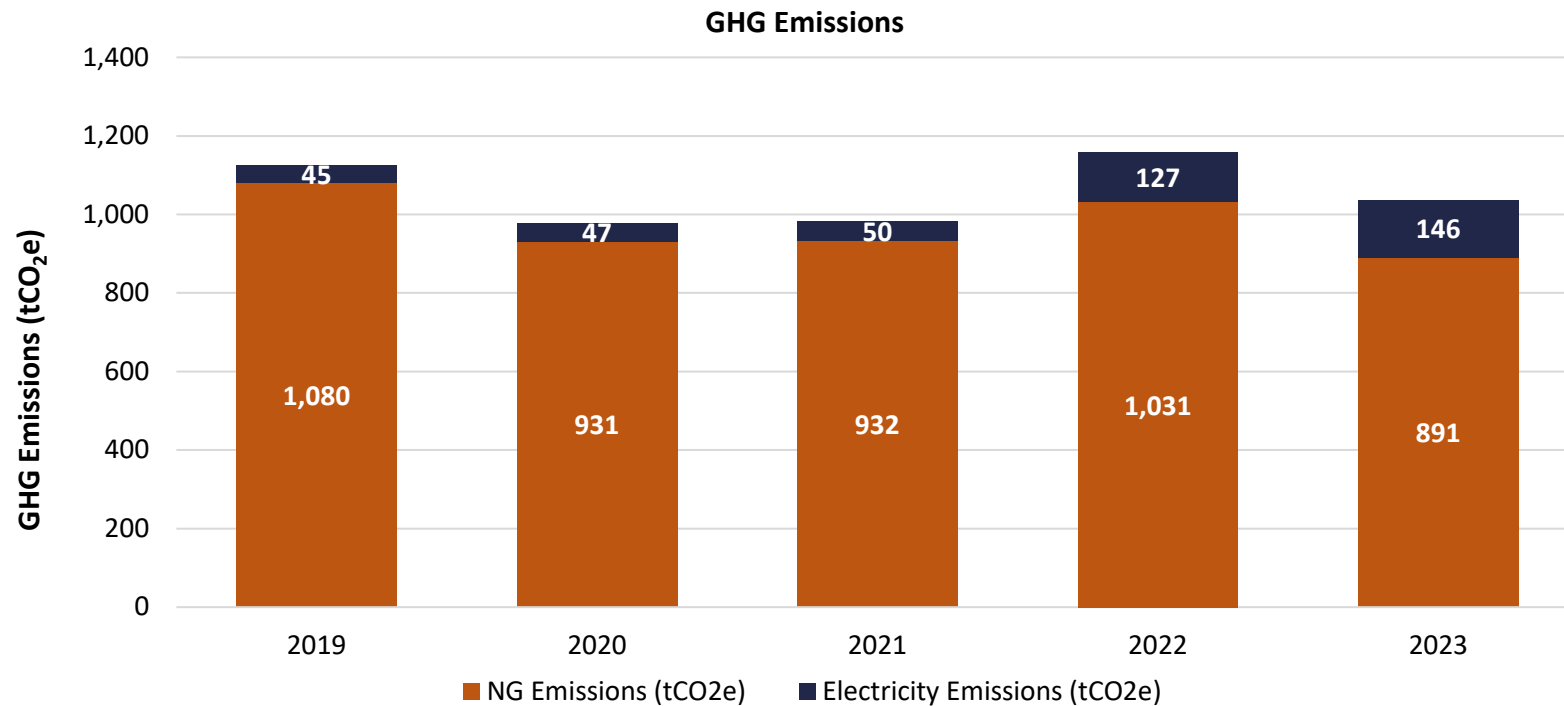


Figure 6. Historic GHG Emissions for Sudbury Outpatient Centre



9.3. Mental Health & Addictions Centre

The greenhouse gas emissions are calculated based on the energy consumption data analyzed.

	GHG Emissions (tCO ₂ e)				
	2019	2020	2021	2022	2023
Electricity (scope 2)	25	27	29	71	92
Natural Gas (scope 1)	480	405	375	415	460
Totals	505	432	404	486	552

Table 12. Historic GHG Emissions for Mental Health & Addictions Centre

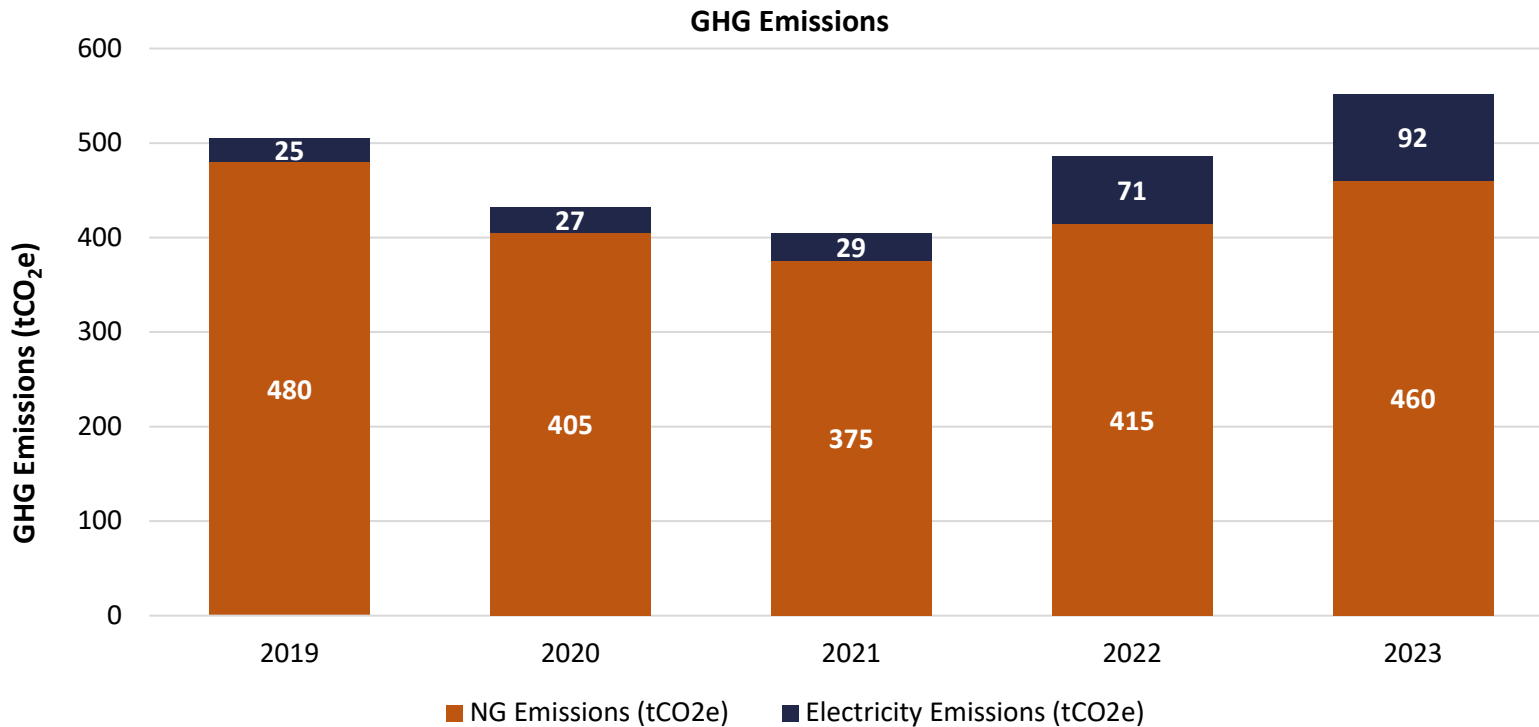


Figure 7. Historic GHG Emissions for Mental Health & Addictions Centre



10. Conservation & Demand Management

Conservation & Demand Management requires adequate planning to produce long-term success. This section of the report outlines the following:

Proposed Conservation Measures Summary

The following table summarizes the recommended energy efficiency measures discovered throughout the auditing process that requires further investigation; and it outlines the impacted utility for each category.

The following proposed conservation measures will be explored for feasibility. The table below details potential conservation measures based on our energy analysis and outlines the impacted utility for each measure. 'X's represent utilities that will be affected by the conservation measures.



Site	Sustainable Measures	Electricity	Nat Gas	Water
Ramsey Lake Health Center	Exterior Windows Replacement	X	X	
Ramsey Lake Health Center	South Tower Lighting Controls	X		
Ramsey Lake Health Center	Window Replacement	X	X	
Ramsey Lake Health Center	Boiler Optimization	X	X	
Ramsey Lake Health Center	Replace Window Seals	X	X	
Ramsey Lake Health Center	Replace RO Water System			X
Ramsey Lake Health Center	Building Automation Upgrade and VFDs	X		
Ramsey Lake Health Center	Thermal Storage	X		X
Ramsey Lake Health Center	Steam Boiler Optimization		X	
Ramsey Lake Health Center	Solar & Geothermal	X	X	
Ramsey Lake Health Center	Chiller Optimization	X		
Ramsey Lake Health Center	Glycol Reclaim Optimization		X	
Ramsey Lake Health Center	Fume Hood Optimization	X	X	
Ramsey Lake Health Center	Data Centre Optimization	X		
Ramsey Lake Health Center	Cooling Tower New Design	X		
Ramsey Lake Health Center	Primus Chiller Replacement	X		
Ramsey Lake Health Center	Low Flow Toilets			X
Ramsey Lake Health Center	Recommissioning BAS	X	X	
Ramsey Lake Health Center	Airflow Control	X	X	
Ramsey Lake Health Center	Conversion of MUA units to MAUs	X	X	
Ramsey Lake Health Center	Convert Glycol Heating loops from Constant to Variable	X		
Ramsey Lake Health Center	Replace AHUs	X	X	
Ramsey Lake Health Center	Install a Combined Heat and Power (CHP) plant (Class A)	X	X	
Ramsey Lake Health Center	Solar PV rooftop System	X		
Ramsey Lake Health Center	Replace Absorption Chiller by Heat Pump 720ton	X	X	
Ramsey Lake Health Center	Exhaust Air Heat Recovery	X	X	
Sudbury Outpatient Center	BAS Upgrade	X	X	
Sudbury Outpatient Center	LED Lighting Upgrade	X		
Sudbury Outpatient Center	VFD Installation	X		
Sudbury Outpatient Center	Steam Trap Survey		X	
Mental Health & Addictions Center Kirkwood Site	Lighting Controls	X		
Mental Health & Addictions Center Kirkwood Site	LED Lighting Upgrade	X		
Mental Health & Addictions Center Kirkwood Site	VFD Installation	X		
Mental Health & Addictions Center Kirkwood Site	BAS Upgrade	X	X	



10.1. Energy Commodities Management

Energy management refers to both how energy is purchased and how energy is used for building operations. An important aspect of energy management is putting in place an adaptable energy commodities procurement strategy to be able to adjust to fluctuating commodity prices. We currently work with Blackstone Energy Management Services Inc. to assist us in our energy commodities procurement. Working with Blackstone allows us to meet or reduce our energy commodity budgets. This process ensures that resources can be properly allocated to energy and water saving programs.



10.2. Cleaning, Sanitization and Disinfection

Cleaning, disinfection and infection control are important aspects of our hospital environment. As part of our Energy Conservation and Demand Management Plan we believe that the right combination of housekeeping and infection control practices can further support our sustainable efforts while improving patient care. As part of our on-going commitment to sustainability, we are currently reviewing the use of different strategies such as microfiber cleaning systems, antimicrobial coatings, and environmentally friendly cleaning and disinfection products.



11. Closing Comments

Thank you to all who contributed to Health Sciences North's Energy Conservation & Demand Management Plan. We consider our facility a primary source of care, and an integral part of the local community. The key to this relationship is being able to use our facilities efficiently and effectively to maximize our ability to provide the highest quality of healthcare services while integrating environmental stewardship into all aspects of facility operations.

On behalf of the senior management team here at Health Sciences North, we approve this Energy Conservation & Demand Management Plan.

David McNeil
President and CEO



12. Acknowledgement

This report was prepared through collaboration between the Health Sciences North's Facilities Management and the Blackstone Energy Service's Team.

