397-11: Phase 4
2019-06-24

# Conservation & Demand

## Management Plan

Health Sciences North
Horizon Santé-Nord

# Executive Summary

## The following “Energy Conservation and Demand Management Plan” is written in accordance with sections 6 and 7 of the Green Energy Act, 2009, O. Reg. 397/11.

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.

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# 1. Ontario's Green Energy Act – Overview

Ontario's Green Energy Act (GEA) was created to expand renewable energy generation, encourage energy conservation & promote the creation of clean energy jobs.

## 1.1. Promoting Energy Conservation

Conserving energy not only saves money, it also lowers demand on the electricity system and helps reduce greenhouse gas emissions.

Through conservation, Ontario homeowners, businesses and industry have saved more than 1,900 megawatts of peak demand electricity since 2005 – the equivalent of more than 600,000 homes being taken off the grid.

The GEA continues to promote conservation by:

- Making energy efficiency a key element of Ontario's building code.
- Working with local utilities to reach assigned conservation targets.
- Creating new energy efficiency standards for household appliances.
- Protecting low-income Ontarians through targeted conservation programs.

# 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 transparency, Health Sciences North's 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 sections 6 and 7 of the Green Energy Act, 2009, O. Reg. 397/11. 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.

## Our Key Goals

1. Be Patient and Family-Focused
2. Be Digitally- Enabled
3. Be Socially Accountable
4. Support and Develop our People
5. Strengthen our Academic and Research Impact

## Our Values

Respect, Quality, Transparency, Accountability, Compassion

# 3. 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 North Eastern Ontario community. Facility #3 is maintained by Health Sciences North. The chart below provides a brief site description of each facility.

*Table 1. Summary of Facilities*

| Health Sciences North | |
|---|---|
| **Type of Facility: Total Number of Buildings being Audited:** | Healthcare Services 3 |
| **Facility #1** | |
| Facility Name | Ramsey Lake Health Centre |
| Address | 41 Ramsey Lake Rd., Sudbury, ON |
| Gross Area ($ft^2$) | 1,034,832 |
| 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) |

# 4. 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.

## 4.1 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 | | | | | | |
|---|---|---|---|---|---|---|
| | **2013** | **2014** | **2015** | **2016** | **2017** | **2018** |
| Energy Intensity (ekWh/sq. ft) | 73.18 | 71.62 | 70.72 | 71.14 | 68.00 | 65.86 |
| Water ($m^3$) | 206,265 | 188,974 | 183,889 | 198,547 | 192,382 | 206,486 |
| Sudbury Outpatient Centre | | | | | | |
| | **2013** | **2014** | **2015** | **2016** | **2017** | **2018** |
| Energy Intensity (ekWh/sq. ft) | 50.64 | 47.79 | 43.63 | 41.07 | 43.03 | 40.45 |
| Water ($m^3$) | 13,611 | 13,891 | 15,251 | 11,208 | 17,981 | 13,831 |
| Mental Health & Addictions Centre | | | | | | |
| | **2013** | **2014** | **2015** | **2016** | **2017** | **2018** |
| Energy Intensity (ekWh/sq. ft) | 47.27 | 49.88 | 42.61 | 37.67 | 43.02 | 35.77 |
| Water ($m^3$) | 3,611 | 4,496 | 4,514 | 5,192 | 6,627 | 9,061 |

# 5. Utility Consumption

## 5.1 Ramsey Lake Health Centre

Current utilities supplied for Ramsey Lake Health 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). In the cooling season, when in operation, a privately owned on-site co-gen facility provides steam for a 680-ton absorption chiller and in the heating season, the waste heat from the co-gen engines assist in heating the facility.

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

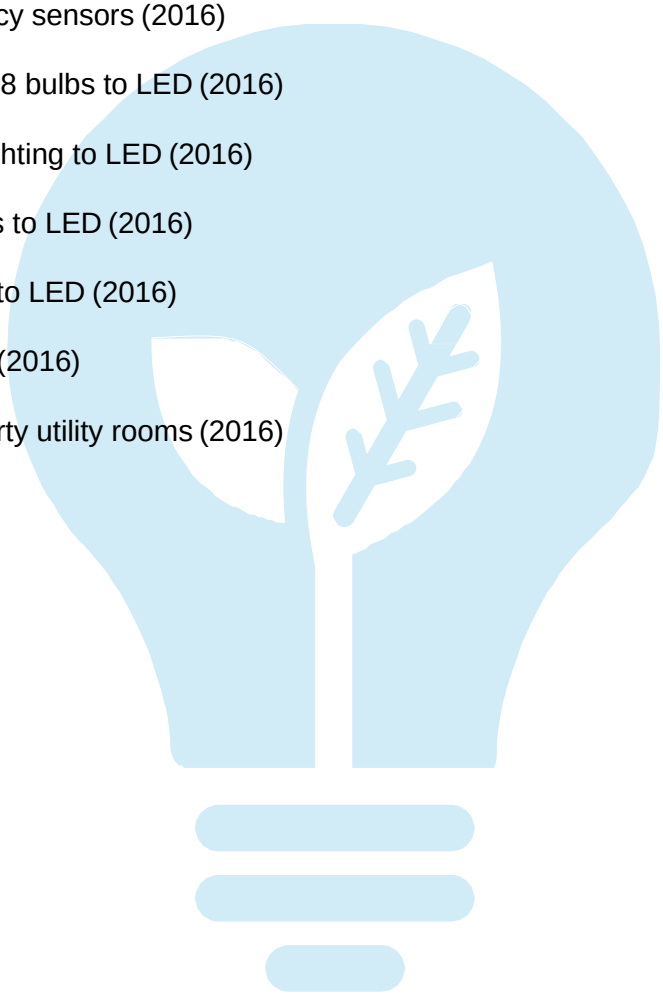
| Utility Source | Annual Consumption (units) | | | | | |
|---|---|---|---|---|---|---|
| | **2013** | **2014** | **2015** | **2016** | **2017** | **2018** |
| Electricity (kWh) | 26,809,899 | 25,920,155 | 25,776,485 | 25,387,063 | 24,251,698 | 24,468,807 |
| Co-Gen (kWh) | 665,670 | 101,938 | 177,311 | 0 | 0 | 0 |
| Electricity (Total) | 27,475,569 | 26,022,093 | 25,953,797 | 25,387,063 | 24,251,698 | 24,468,807 |
| Natural Gas ($m^3$) | 3,194,424 | 3,503,395 | 3,171,908 | 2,305,937 | 3,217,099 | 4,095,485 |
| Steam ($m^3$) | 808,636 | 692,172 | 764,046 | 1,399,605 | 739,580 | 0 |
| Hot Water ($m^3$) | 580,985 | 360,479 | 537,662 | 863,292 | 411,870 | 133,586 |
| Natural Gas (Total) | 4,584,045 | 4,556,046 | 4,473,616 | 4,568,834 | 4,368,549 | 4,229,071 |
| Water ($m^3$) | 206,265 | 188,974 | 183,888 | 198,547 | 196,382 | 206,486 |

*Section 6.2.1 will further describe electricity usage in the facility

**Section 6.2.2 will further describe natural gas usage within the on-site cogeneration facility.

# Energy Initiatives Completed at the Ramsey Lake Health Centre 2016 & 2017

- Installation of 5 star energy efficient filters (2017)
- Replacement of ED and main canopy lighting to LED (2017)
- Replacement of exit signs to running man – RCP & Lodge (2017)
- Replacement of exit signs to running man – CTC (2017)
- VFD installation phase III (2017)
- VFD installation phase II (2016)
- Replacement of pendant lighting in the main lobby RCP to LED (2016)
- Level 7 mechanical room occupancy sensors (2016)
- Replacement of 25,000 standard T8 bulbs to LED (2016)
- Replacement of exterior canopy lighting to LED (2016)
- Replacement of exterior wall packs to LED (2016)
- Converted exterior bollard lighting to LED (2016)
- Installation of steam sub-metering (2016)
- Occupancy sensors in the clean/dirty utility rooms (2016)



## 5.2 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) | | | | |
|---|---|---|---|---|---|---|
| | **2013** | **2014** | **2015** | **2016** | **2017** | **2018** |
| Electricity (kWh) | 2,605,915 | 2,321,662 | 2,418,264 | 2,314,880 | 2,067,151 | 1,847,107 |
| Natural Gas ($m^3$) | 637,430 | 618,643 | 530,756 | 500,517 | 561,690 | 525,702 |
| Water ($m^3$) | 13,611 | 13,891 | 15,251 | 11,208 | 17,981 | 13,831 |

## Energy Initiatives Completed at the Sudbury Outpatient Centre in 2016 & 2017

- SOC building automation upgrades (2017)
- Replacement of lobby lighting to LED (2017)
- Exterior lighting replaced with LED (2017)
- Replacement of stairwell lighting to LED (2016)
- Replacement of 2500 T8's to LED (2017)
- Installation of new energy efficient AHU's (2016)
- Roof replacement(s) (2016)
- Upgrades of DDC controls for fan scheduling (2016)
- Lighting culture programs

## 5.3 Mental Health and Addictions 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) | | | | | |
|---|---|---|---|---|---|---|
| | **2013** | **2014** | **2015** | **2016** | **2017** | **2018** |
| Electricity (kWh) | 1,466,486 | 1,423,957 | 1,380,164 | 1,350,609 | 1,359,674 | 1,088,502 |
| Natural Gas ($m^3$) | 306,537 | 337,292 | 272,853 | 228,855 | 278,720 | 231,469 |
| Water ($m^3$) | 3,611 | 4,496 | 4,514 | 4,192 | 6,627 | 9,061 |

## Energy Initiatives Completed at the Mental Health and Addictions Centre in 2016 & 2017

- BAS Upgrades (2017)
- Replacement of the elevators (2017)
- Replacement of the cottage's boilers (2017)
- Replacement of the cottages hot water tanks (2017)
- Replacement of Cottage II RTU's (2017)
- Installation of 5 star energy efficient filters (2017)
- Replacement of 1500 T8's to LED (2016)
- Culture programs

# 6. End Use – Energy

## 6.1 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 | % of Total Energy Use |
|---|---|
| Space Heating | 23% |
| Space Cooling | 3% |
| Water Heating | 39% |
| Auxiliary Equipment - Plug Load | 4% |
| Auxiliary Equipment - Significant Energy Users | 7% |
| Auxiliary Motors | 17% |
| Lighting | 7% |
| Totals | 100% |

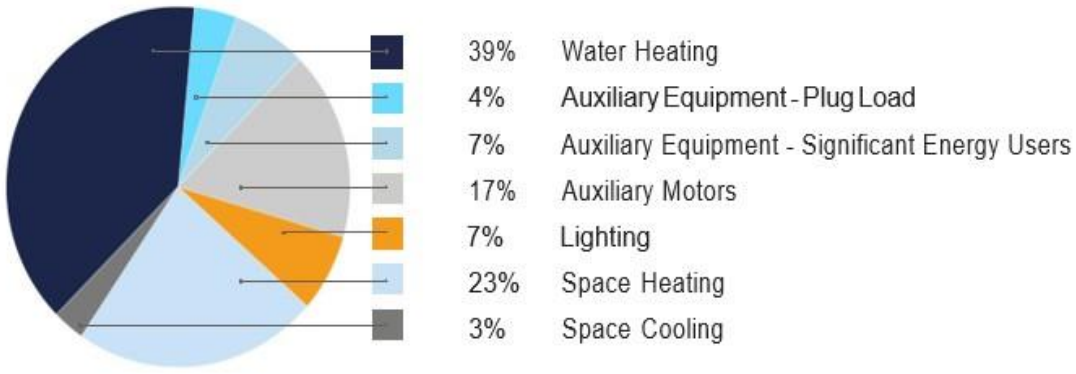



*Figure 1. End Use Energy Summary for Ramsey Lake Health Centre*

## 6.2 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. Figure 2. End Use Energy Summary for Sudbury Outpatient Centre*

| End Use - Energy | Annual Energy (%) |
|---|---|
| Space Heating | 33.50% |
| Space Cooling | 4.38% |
| Water Heating | 43.94% |
| Plug Load | 3.12% |
| *Aux. Equipment | 0.00% |
| Aux. Motors | 6.39% |
| Lighting | 7.02% |
| Servers | 1.65% |
| Totals | 100.00% |

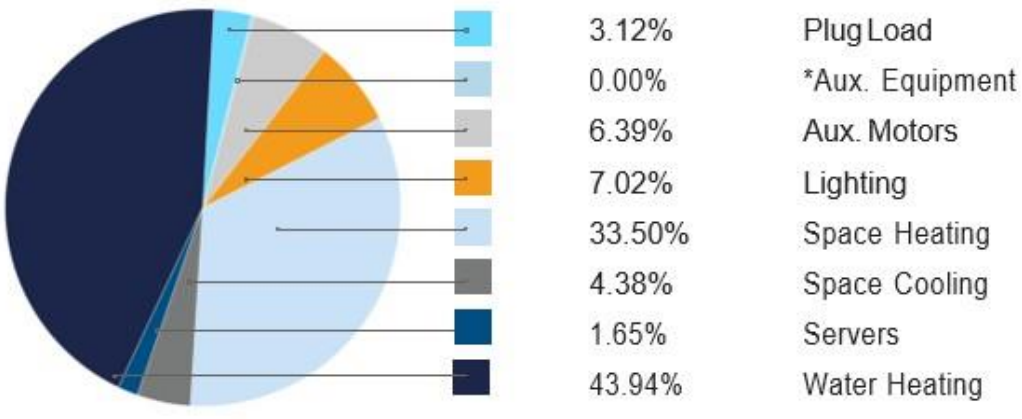



*Figure 2. End Use Energy Summary for Sudbury Outpatient Centre*

## 6.3 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 | 56.48% |
| Space Cooling | 6.79% |
| Water Heating | 8.53% |
| Plug Load | 4.04% |
| *Aux. Equipment | 0.50% |
| Aux. Motors | 14.68% |
| Lighting | 6.33% |
| Servers | 2.65% |
| Totals | 100.00% |

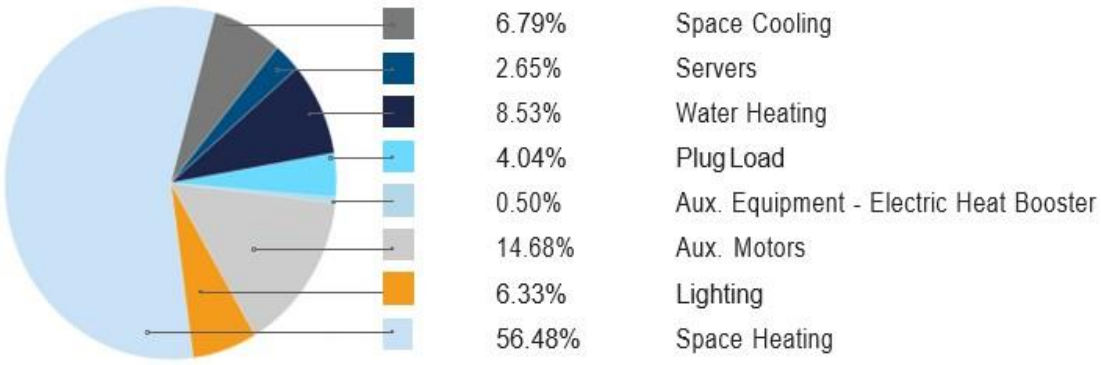



*Figure 3. End Use Energy Summary for Mental Health & Addictions Centre*

# 7. 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.

In this case, we are comparing our facilities to peer hospitals. Peer hospitals include hospitals with similar energy use requirements and locations.

*Table 9. Historic Energy Use Intensity*

| Facility | Annual Consumption (units) | | | | | |
|---|---|---|---|---|---|---|
| | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 |
| Ramsey Lake Health Centre | 73.18 | 71.62 | 70.72 | 71.14 | 68.00 | 65.86 |
| Sudbury Outpatient Centre | 50.64 | 47.79 | 43.36 | 41.07 | 43.23 | 40.45 |
| Mental Health & Addictions Centre | 47.27 | 49.87 | 42.61 | 37.67 | 43.03 | 35.77 |

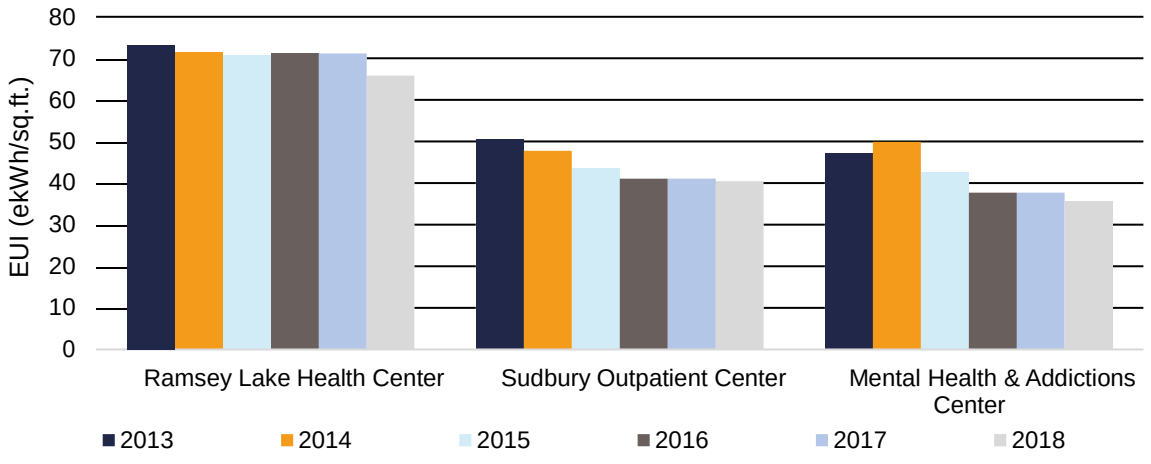
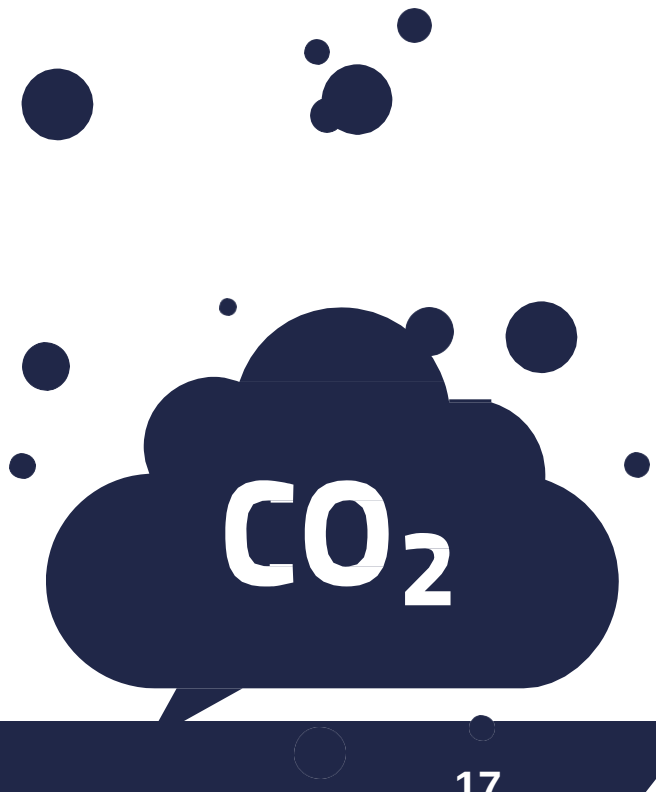



*Figure 4. Historic Energy Use Intensity*

# 8. 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 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.

## 8.1 Ramsey Lake Health Centre

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

*Table 10. Historic Utility Consumption & GHG Emissions for Ramsey Lake Health Centre*

| | Annual Consumption (units) | | | | | | GHG Emissions (tonnes) | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **2013** | **2014** | **2015** | **2016** | **2017** | **2018** | **2013** | **2014** | **2015** | **2016** | **2017** | **2018** |
| Electricity | 27,475,569 | 26,022,093 | 25,953,797 | 25,387,063 | 24,251,698 | 24,468,807 | 2,088 | 1,978 | 1,973 | 1,930 | 1,844 | 1,860 |
| Natural Gas | 4,584,045 | 4,556,046 | 4,473,616 | 4,568,834 | 4,368,549 | 4,229,071 | 8,667 | 8,614 | 8,458 | 8,638 | 8,259 | 7,993 |
| Totals | | | | | | | 10,755 | 10,592 | 10,431 | 10,568 | 10,103 | 9,853 |

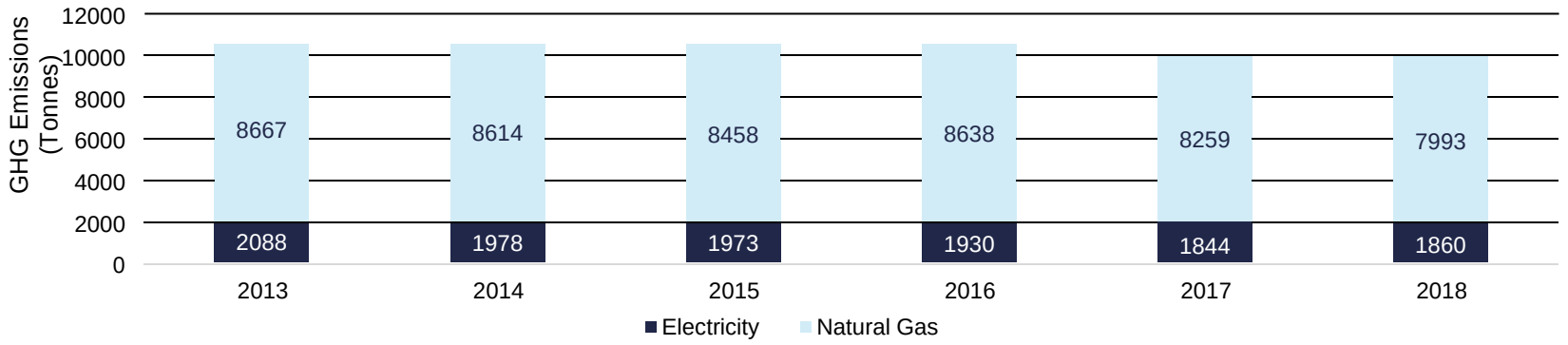



*Figure 5. Historic GHG Emissions for Ramsey Lake Health Centre*

## 8.2 Sudbury Outpatient Centre

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

*Table 11. Historic Utility Consumption & GHG Emissions for Sudbury Outpatient Centre*

| | Annual Consumption (units) | | | | | | GHG Emissions (tonnes) | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **2013** | **2014** | **2015** | **2016** | **2017** | **2018** | **2013** | **2014** | **2015** | **2016** | **2017** | **2018** |
| Electricity | 2,605,915 | 2,321,662 | 2,418,264 | 2,314,880 | 2,067,151 | 1,847,107 | 198 | 176 | 184 | 176 | 157 | 140 |
| Natural Gas | 637,430 | 618,643 | 530,756 | 500,517 | 561,690 | 525,702 | 1,205 | 1,170 | 1,003 | 946 | 1,062 | 994 |
| Totals | | | | | | | 1,403 | 1,346 | 1,187 | 1,122 | 1,219 | 1,134 |

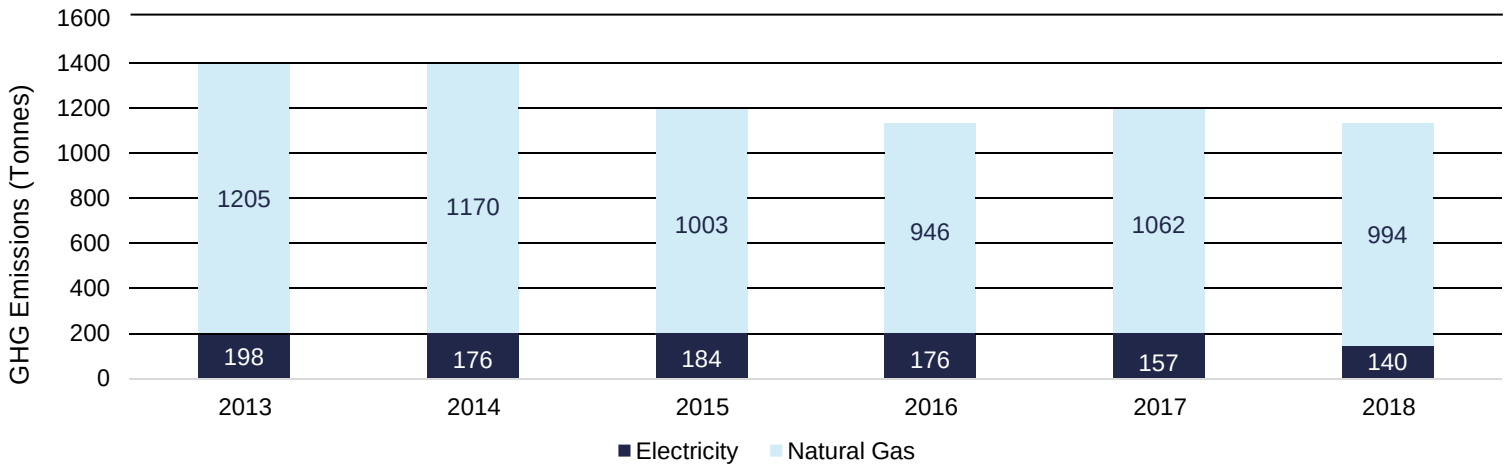



*Figure 6. Historic GHG Emissions for Sudbury Outpatient Centre*

## 8.3 Mental Health & Addictions Centre

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

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

| Utility Source | Annual Consumption (units) | | | | | | GHG Emissions (tonnes) | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **2013** | **2014** | **2015** | **2016** | **2017** | **2018** | **2013** | **2014** | **2015** | **2016** | **2017** | **2018** |
| Electricity | 1,466,486 | 1,423,957 | 1,380,164 | 1,350,609 | 1,359,674 | 1,088,502 | 111 | 108 | 105 | 103 | 104 | 83 |
| Natural Gas | 306,537 | 337,292 | 272,853 | 228,855 | 278,720 | 231,469 | 580 | 638 | 516 | 433 | 527 | 437 |
| Totals | | | | | | | 691 | 746 | 621 | 536 | 631 | 520 |

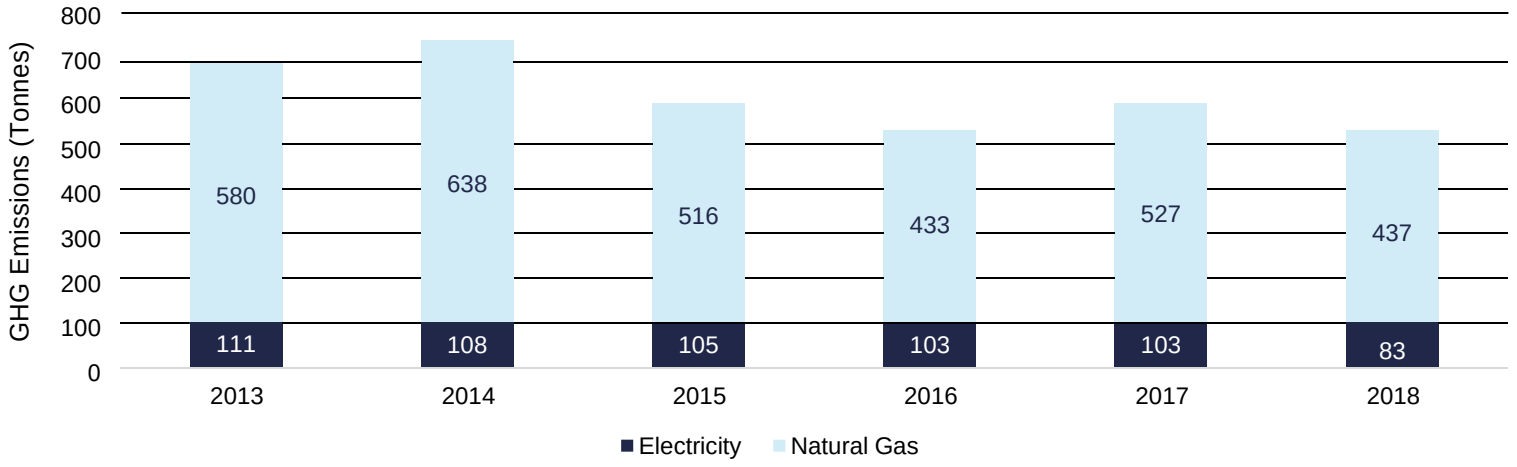



*Figure 7. Historic GHG Emissions for Mental Health & Addictions Centre*

# 9. 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 and water 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 | 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 | New Cog Belts | X | | |
| Ramsey Lake Health Center | Low Flow Toilets | | | 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 | |

## 9.1 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.


## 9.2 Cleaning, Sanitization and Disinfection

Cleaning, disinfection and infection control are important aspects of our hospital environment. As part of our 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.

# 10. Utility Consumption Forecast

## 10.1 Ramsey Lake Health Centre

From implementing the energy conservation measures stated in the previous sections, the projected electricity and natural gas use could be forecasted based on the utility savings generated from the individual measures. The forecasted utility consumption, and the change in consumption (with 2018 as a baseline) are tabulated below.

*Table 13. Forecasted Utility Consumption for Ramsey Lake Health Centre*

| | 2019 | | 2020 | | 2021 | | 2022 | | 2023 | | 2024 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Units | % Change | Units | % Change | Units | % Change | Units | % Change | Units | % Change | Units | % Change |
| Electricity (kWh) | 24,224,119 | 1% | 24,100,077 | 2% | 23,734,743 | 3% | 23,490,055 | 4% | 23,245,367 | 5% | 23,000,679 | 6% |
| Natural Gas ($m^3$) | 4,186,780 | 1% | 4,144,490 | 2% | 4,102,199 | 3% | 4,059,908 | 4% | 4,017,617 | 5% | 3,975,327 | 6% |
| Water ($m^3$) | 204,421 | 1% | 202,356 | 2% | 200,291 | 3% | 198,227 | 4% | 196,162 | 5% | 194,097 | 6% |

## 10.2 Sudbury Outpatient Center

From implementing the energy conservation measures stated in the previous sections, the projected electricity and natural gas use could be forecasted based on the utility savings generated from the individual measures. The forecasted utility consumption and the change in consumption (with 2018 as a baseline) are tabulated below.

*Table 14. Forecasted Utility Consumption for Sudbury Outpatient Centre*

| | Annual Consumption Forecast (units) | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 2019 | | 2020 | | 2021 | | 2022 | | 2023 | | 2024 | |
| | Units | % Change | Units | % Change | Units | % Change | Units | % Change | Units | % Change | Units | % Change |
| Electricity (kWh) | 1,828,636 | 1% | 1,810,165 | 2% | 1,791,694 | 3% | 1,773,223 | 4% | 1,754,752 | 5% | 1,736,281 | 6% |
| Natural Gas ($m^3$) | 520,445 | 1% | 515,188 | 2% | 509,931 | 3% | 504,674 | 4% | 499,417 | 5% | 494,160 | 6% |
| Water ($m^3$) | 13,693 | 1% | 13,554 | 2% | 13,416 | 3% | 13,278 | 4% | 13,139 | 5% | 13,001 | 6% |

## 10.3 Mental Health & Addictions Center

From implementing the energy conservation measures stated in the previous sections, the projected electricity and natural gas use could be forecasted based on the utility savings generated from the individual measures. The forecasted utility consumption and the change in consumption (with 2018 as a baseline) are tabulated below.

*Table 15. Forecasted Utility Consumption for Mental Health & Addictions Centre*

| | Annual Consumption Forecast (units) | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 2019 | | 2020 | | 2021 | | 2022 | | 2023 | | 2024 | |
| | Units | % Change | Units | % Change | Units | % Change | Units | % Change | Units | % Change | Units | % Change |
| Electricity (kWh) | 1,077,617 | 1% | 1,066,732 | 2% | 1,055,847 | 3% | 1,044,962 | 4% | 1,034,077 | 5% | 1,023,192 | 6% |
| Natural Gas ($m^3$) | 229,154 | 1% | 226,840 | 2% | 224,525 | 3% | 222,210 | 4% | 219,896 | 5% | 217,581 | 6% |
| Water ($m^3$) | 8,970 | 1% | 8,880 | 2% | 8,789 | 3% | 8,699 | 4% | 8,608 | 5% | 8,517 | 6% |

# 11. GHG Emissions Forecast

## 11.1 Ramsey Lake Health Centre

From implementing the energy conservation measures stated in the previous sections, the projected GHG reduction could be forecasted based on the utility savings generated from the individual measures. The forecasted GHG Emissions reduction and the change in emissions (with 2018 as a baseline) are tabulated below.

*Table 16. Forecasted GHG Emissions for Ramsey Lake Health Centre*

| GHG Emissions (tonnes) | | | | | | |
|---|---|---|---|---|---|---|
| | **2019** | **2020** | **2021** | **2022** | **2023** | **2024** |
| Electricity | 1,841 | 1,832 | 1,804 | 1,785 | 1,767 | 1,748 |
| Natural Gas | 7,913 | 7,833 | 7,753 | 7,673 | 7,593 | 7,513 |
| Total | 9,754 | 9,665 | 9,557 | 9,458 | 9,360 | 9,261 |
| % Reduction from 2018 | 1% | 2% | 3% | 4% | 5% | 6% |

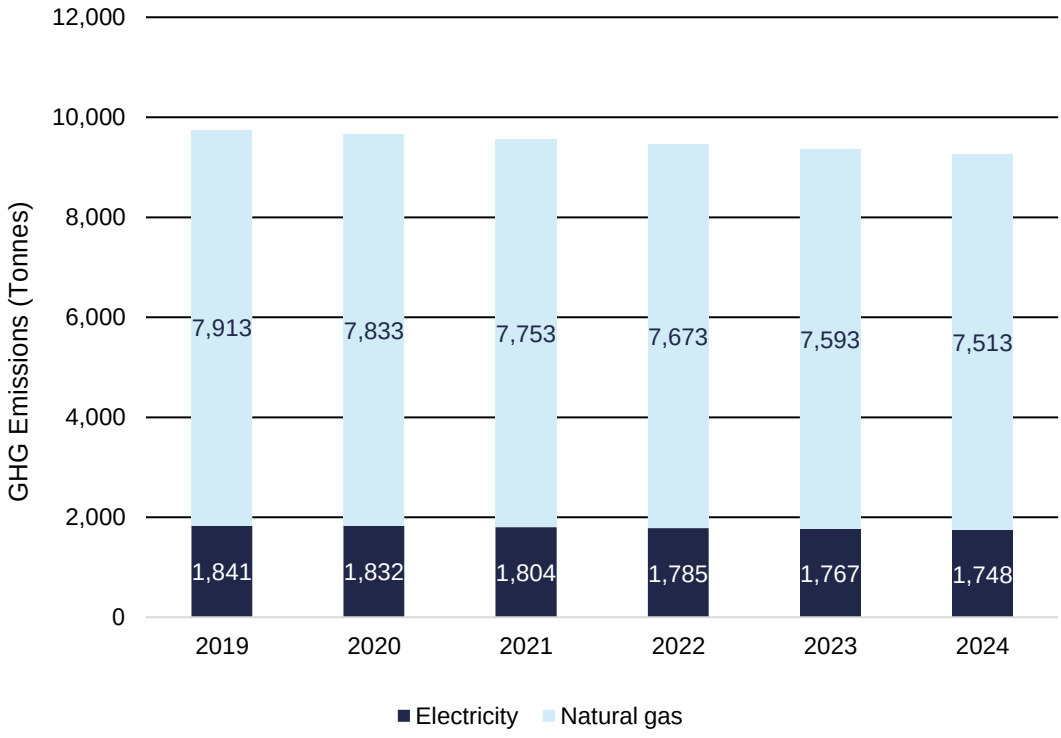



*Figure 8. Forecasted GHG Emissions for Ramsey Lake Health Centre*

## 11.2 Sudbury Outpatient Center

From implementing the energy conservation measures stated in the previous sections, the projected GHG reduction could be forecasted based on the utility savings generated from the individual measures. The forecasted GHG Emissions reduction and the change in emissions (with 2018 as a baseline) are tabulated below.

*Table 17. Forecasted Utility Consumption & GHG Emissions for Sudbury Outpatient Centre*

| GHG Emissions (tonnes) | | | | | | |
|---|---|---|---|---|---|---|
| | **2019** | **2020** | **2021** | **2022** | **2023** | **2024** |
| Electricity | 139 | 138 | 136 | 135 | 133 | 132 |
| Natural Gas | 984 | 974 | 964 | 954 | 944 | 934 |
| Total | 1,123 | 1,111 | 1,100 | 1,089 | 1,077 | 1,066 |
| % Reduction from 2018 | 1% | 2% | 3% | 4% | 5% | 6% |

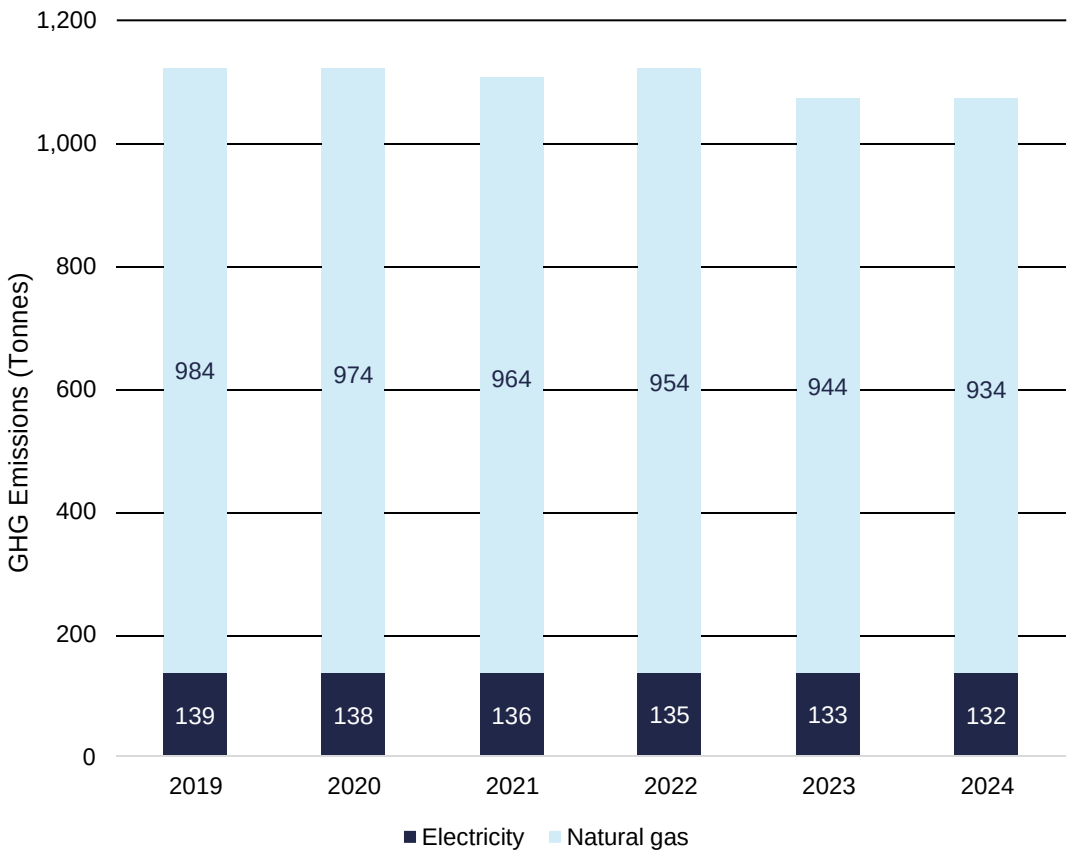



*Figure 9. Forecasted GHG Emissions for Sudbury Outpatient Centre*

## 11.3 Mental Health & Addictions Center

From implementing the energy conservation measures stated in the previous sections, the projected GHG reduction could be forecasted based on the utility savings generated from the individual measures. The forecasted GHG Emissions reduction and the change in emissions (with 2018 as a baseline) are tabulated below.

*Table 18. Forecasted Utility Consumption & GHG Emissions for Mental Health & Addictions Centre*

| GHG Emissions (tonnes) | | | | | | |
|---|---|---|---|---|---|---|
| | **2019** | **2020** | **2021** | **2022** | **2023** | **2024** |
| Electricity | 82 | 81 | 80 | 79 | 79 | 78 |
| Natural Gas | 433 | 429 | 424 | 420 | 416 | 411 |
| Total | 515 | 510 | 505 | 499 | 494 | 489 |
| % Reduction from 2018 | 1% | 2% | 3% | 4% | 5% | 6% |

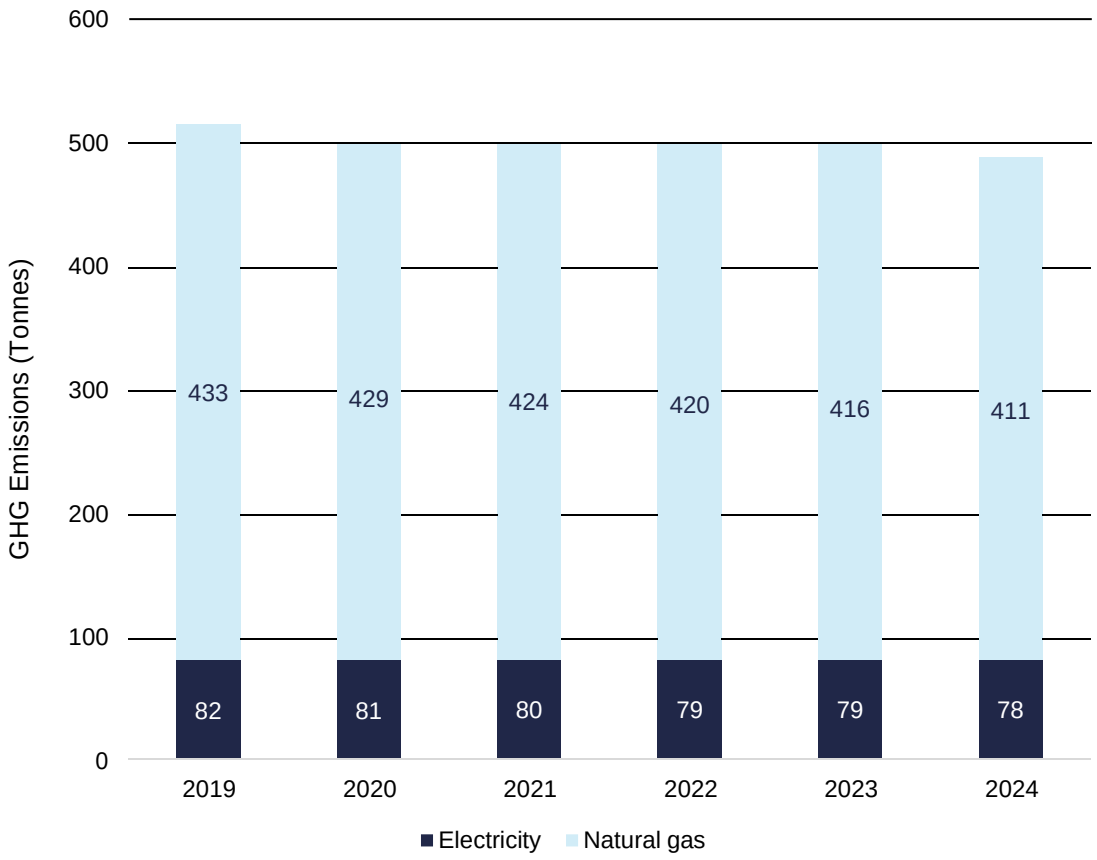



*Figure 10. Forecasted GHG Emissions for Mental Health & Addictions Centre*

# 12. Closing Comments

Thank you to all who contributed to Health Sciences North's Conservation & Demand Management Plan. We consider our facility a primary source of giving 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 Conservation & Demand Management Plan.

X

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Dominic Giroux, President and CEO

# 13. Acknowledgement

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