



ENERGY CONSERVATION & DEMAND MANAGEMENT PLAN

2019



Santé
Manitouswadge
Health

Executive Summary

The purpose of this Energy Conservation and Demand Management (ECDM) Plan from Santé Manitouswadge Health (“SMH”) is to outline specific actions and measures that will promote good stewardship of our environment and community resources in the years to come. The Plan will accomplish this, in part, by looking at future projections of energy consumption and reviewing past conservation measures.

In keeping with SMH’s core values of efficiency, concern for the environment and financial responsibility, this ECDM outlines how the hospital will reduce overall energy consumption, operating costs and greenhouse gas emissions. By following the measures outlined in this document, we will be able to provide compassionate service to more people in the community. This ECDM Plan is written in accordance with sections 4, 5, and 6 of the recently amended Electricity Act, 1998, O. Reg. 507/18.

Through past conservation and demand initiatives, SMH has achieved the following results:

- 87,498 L reduction in propane use
- 26% reduction in the hospital’s total energy use since 2013

Today, utility and energy related costs are a significant part of overall operating costs. In 2018:

- Energy Use Index (EUI) was 55 ekWh/ft²
- Energy-related emissions equaled 341 tCO₂e

To obtain full value from energy management activities, SMH will take a strategic approach to fully integrate energy management into its business decision-making, policies and operating procedures. This active management of energy-related costs and risks will provide a significant economic return and will support other key organizational objectives.

With this prominent focus on energy management, SMH can expect to achieve the following targets by 2024:

- ~ 11% reduction in electricity consumption
- ~ 21% reduction in propane consumption
- 66 tCO₂e carbon equivalent emissions reduction

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1 Introduction

In order to obtain full value from energy management activities, and to strengthen our conservation initiatives, a strategic approach must 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 when making financial decisions.

Santé Manitouswage Health remains committed to delivering the best care possible in a fiscally responsible fashion. Each and every member of our team is dedicated to making this happen. In the years to come we will continue with our efforts to help improve quality of care and patient safety, and to deliver better value for money with the services we provide.

Our Vision

Working together, keeping you healthy! | Travailler ensemble, vous gardez en santé!

Our Mission

Your total healthcare experience: compassionate, exceptional and innovative

Our Values

Quality service, pride, trust and teamwork.

2 Regulatory Update

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.

3 About Santé Manitouwadge Health



Picture 1. Santé Manitouwadge Health

Manitouwadge Ontario, located in the heart of the Canadian Shield, is a small community where we know our patients, and not just clinically. We are committed to offering our clients not only convenience, but also a more efficient navigation to healthcare services and improved outcomes. Our team is dedicated and passionate about the services they provide, and integration continues to facilitate the transition to higher quality care.

Facility Overview	
Facility Name	Santé Manitouwadge Health
Type of Facility	Healthcare Services
Address	1 Health Care Crescent, Manitouwadge, ON
Gross Area (ft2)	46,800

Table 1. Santé Manitouwadge Health Overview

3.1 Historical Energy Intensity

Energy Utilization Index is a measure of how much energy a facility uses per square foot. By breaking down a facility’s energy consumption on a per-square-foot-basis, we can compare facilities of different sizes with ease. In this case, we are comparing our facility to the industry average for Ontario hospitals (derived from Natural Resources Canada’s Commercial and Institutional Consumption of Energy Survey), which was found to be **63.23 ekWh/sq. ft.**

Annual Consumption (EUI)						
Year	2013	2014	2015	2016	2017	2018
Santé Manitouwadge Health	73	76	70	64	55	61

Table 2. Historic Energy Intensity

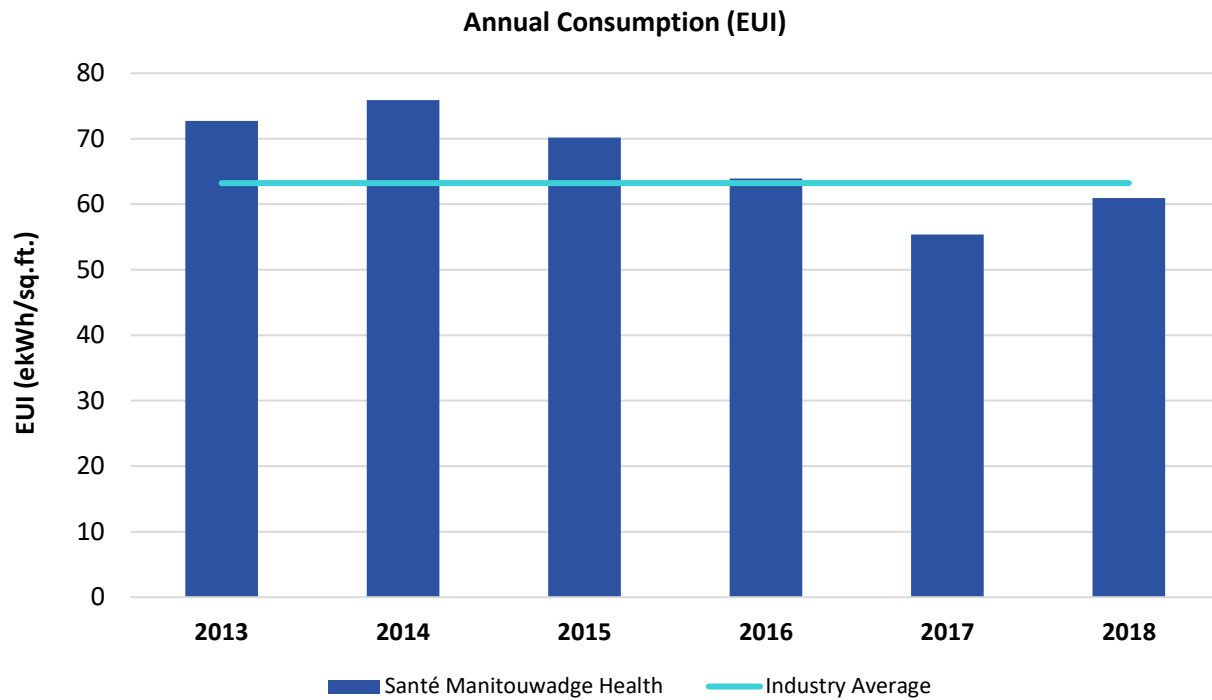


Figure 1. Historic Energy Intensity

3.2 Sustainability Strategies to Date

Santé Manitouswadge Health regularly reviews opportunities for operational improvements and energy conservation. Below is a list of strategies that have been completed over the past 5 years:

- All exterior lighting was replaced with LED models which conserve a significant amount of electricity.
- The facilities hot water tanks were upgraded to a condensing style which will result in significant propane savings.
- 50% of the interior lighting was upgraded to LED models, resulting in further electricity savings.
- Controls were installed on the hot water circulating pumps which reduced the hours that the hot water heaters were running by 20%.

4 Site Analysis



Picture 2. Santé Manitouwadge Health

Santé Manitouwadge Health is situated so that most of the patient rooms have a great view of Lake Manitouwadge and the hills beyond. The north wings house nine private patient care rooms and nine long term care rooms, with some rooms designated for pediatrics, palliative care, isolation and patient lounges. We have embarked on the creation of a local Health Hub for our community by integrating the following services; acute and LTC, Family Health Team, home nursing services (myCare), transportation (myRide), Clinic Management Services, Public Health Education, seniors programs and diabetes education.

Facility Information	
Facility Name	Santé Manitouwadge Health
Address	1 Health Care Crescent, Manitouwadge, ON
Gross Area (Ft. ²)	46,800
Average Operational Hours in a Week	168
Number of Beds	18
Number of Floors	2

Table 3. Santé Manitouwadge Health Facility Information

4.1 Utility Consumption Analysis

In order to compare different energy sources within this report, energy will be expressed in units of ekWh – equivalent kilowatt-hours. The energy contained in a litre of propane would be converted into the equivalent amount of the energy contained in a kilowatt hour of electricity.

Utilities to the site are electricity and propane. The following table summarizes the accounts for each utility. Consumption for each respective utility has been adjusted to fit a regular calendar year (365 days).

Annual Consumption (units)						
Year	2013	2014	2015	2016	2017	2018
Electricity (kWh)	1,303,758	1,178,030	1,121,400	1,117,174	1,112,947	1,174,573
Propane (L)	296,136	334,917	305,212	264,528	208,638	236,583

Table 4. Historic Annual Utility Consumption

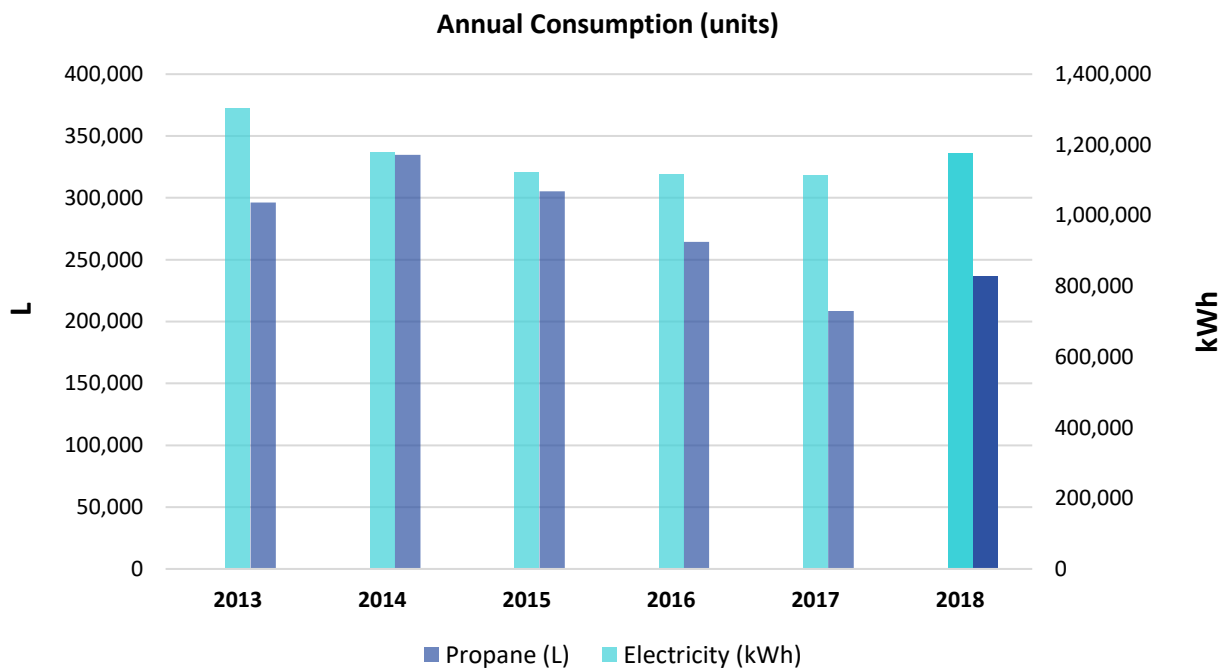


Figure 2. Historic Annual Utility Consumption

4.2 GHG Emissions Analysis

Greenhouse gas (GHG) emissions are expressed in terms of equivalent tonnes of Carbon Dioxide (tCO₂e). The GHG emissions associated with a facility are dependent on the fuel source — for example, hydroelectricity produces fewer greenhouse gases than coal-fired plants, and light fuel oil produces fewer GHGs than heavy oil.

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. Scope 1 (propane and fuel use) and Scope 2 (electricity) consumptions have been converted to their equivalent tonnes of greenhouse gas emissions in the table below. Scope 1 represents the direct emissions from sources owned or controlled by the institution, and Scope 2 consists of indirect emissions from the consumption of purchased energy generated upstream from the institution.

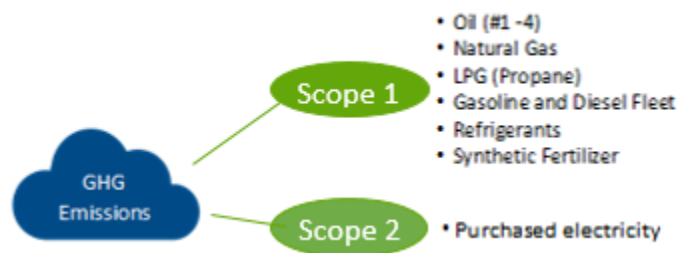


Figure 3. Examples of Scope 1 and 2

GHG Emissions	2013	2014	2015	2016	2017	2018
Electricity	53	48	46	46	46	48
Propane & Fuel Use	419	474	432	374	295	335
Totals	473	522	478	420	341	383

Table 5. Historic Greenhouse Gas Emissions

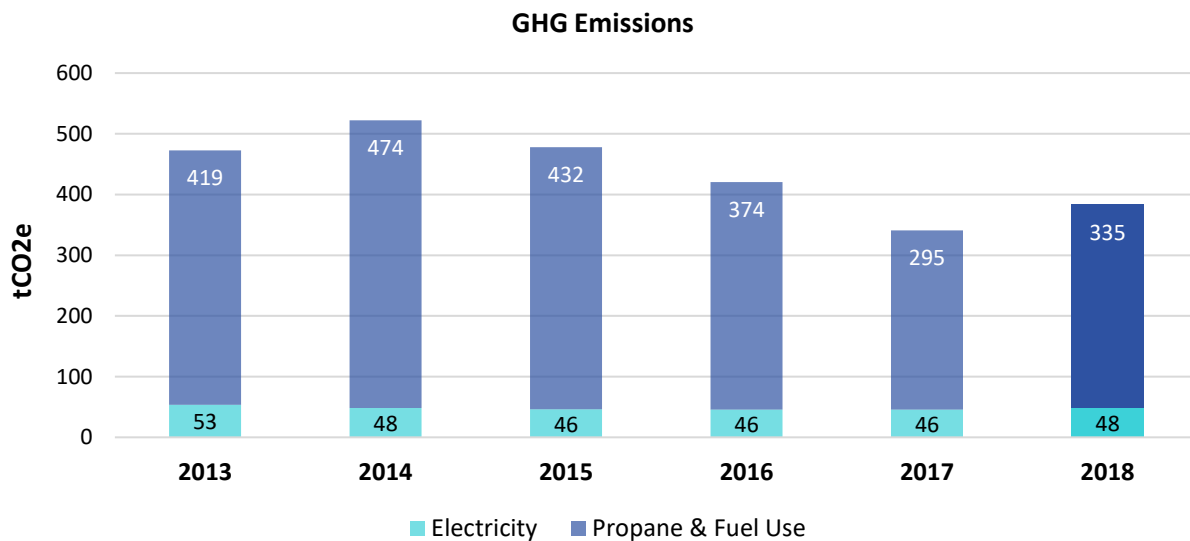


Figure 4. Historic Greenhouse Gas Emissions

4.3 Proposed Conservation Measures

Our energy analysis has revealed several conservation strategies for the facility. SMH’s proposed energy and propane saving initiatives are summarized in the table below outlining the targeted utilities. These measures will remain in place until a more efficient and cost-effective technology is found.

Measure	Impacted Utility	Estimated Annual Savings		Simple Payback (years)	Year of Implementation
		kWh	L		
Interior Lighting Retrofit	Electricity	100,165	0	7.42	2020
Terminal Boiler Replacement with Efficient Model	Propane	0	28,329	3.40	2021
BAS Upgrade from Pneumatic to Electric	Electricity	17,000	0	144.26	2022
Totals		100,165	28,239		

Table 6. Proposed Conservation Measures

4.4 Utility Consumption Forecast

By implementing the energy conservation measures stated in the previous section, the forecasted electricity and natural gas use could be forecasted based on the utility savings generated from individual measures. The forecasted utility consumption is tabulated below. The percentage of change is based off the data from the baseline year of 2018.

	Annual Consumption Forecast (units)											
	2019		2020		2021		2022		2023		2024	
	Units	% Change	Units	% Change	Units	% Change	Units	% Change	Units	% Change	Units	% Change
Electricity (kWh)	1,174,573	0%	1,074,408	9%	1,074,408	9%	1,057,408	10%	1,057,408	10%	1,057,408	10%
Propane (L)	236,583	0%	236,583	0%	236,583	0%	208,254	12%	208,254	12%	208,254	12%

Table 7. Forecast for Annual Utility Consumption

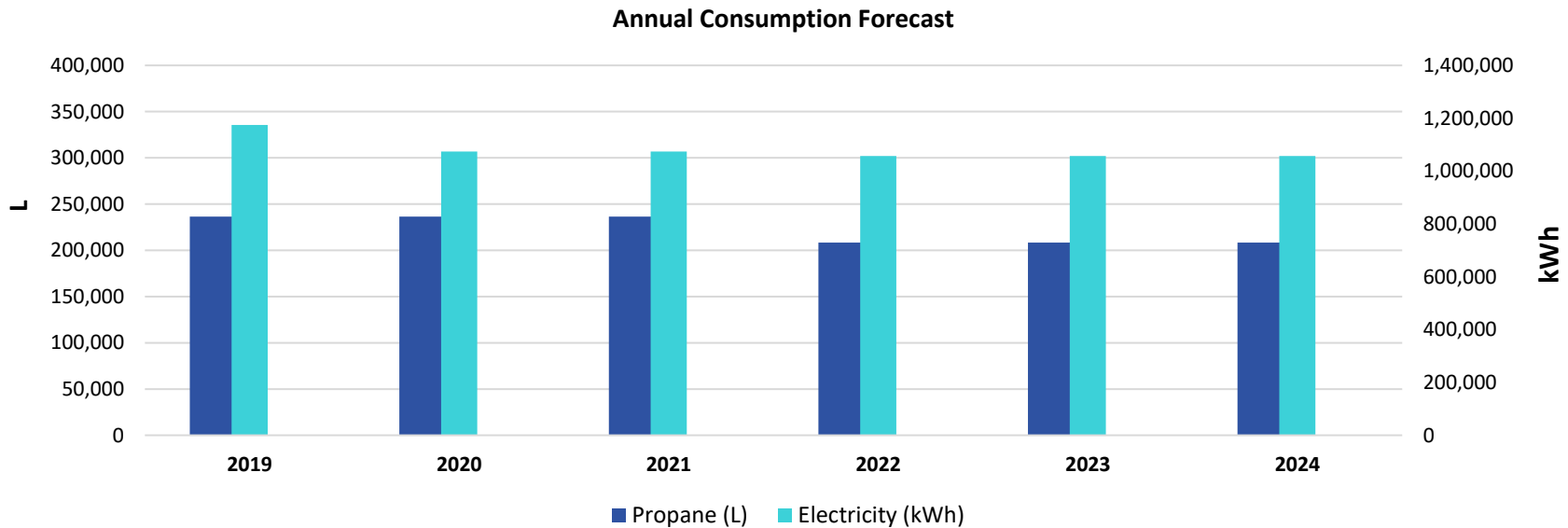


Figure 5. Forecast for Annual Utility Consumption

4.5 GHG Emissions Forecast

The forecasted greenhouse gas emissions are calculated based on the forecasted energy consumption data analyzed in the previous section and are tabulated in the following table. The percentage of reduction is based off the data from the baseline year of 2018.

Annual Emissions Forecast (units)						
Utility Source	2019	2020	2021	2022	2023	2024
Electricity	48	44	44	43	43	43
Propane & Fuel Use	335	335	335	295	295	295
Totals	383	379	379	338	338	338
Reduction from Baseline Year (2018)	0.00%	1.07%	1.07%	11.72%	11.72%	11.72%

Table 8. Forecast for Annual Greenhouse Gas Emissions

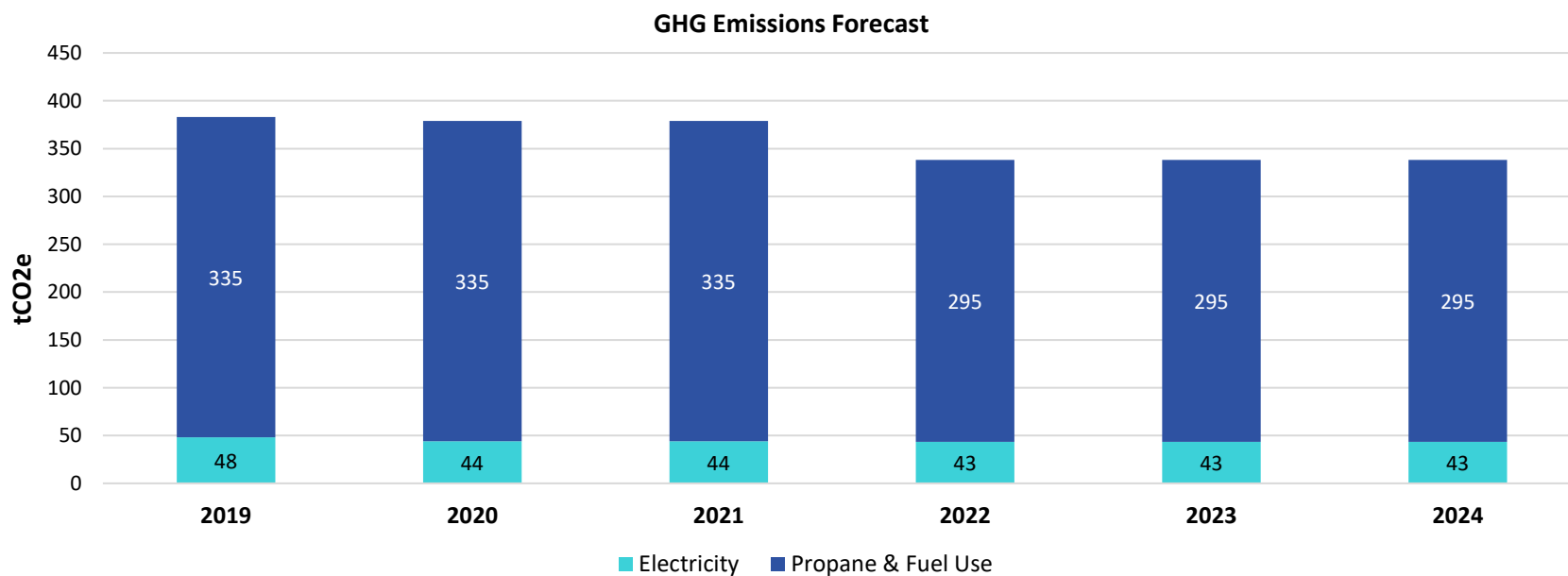


Figure 6. Forecast for Annual Greenhouse Gas Emissions

5 Closing Comments

Thank you to all who contributed to Santé Manitouswadge Health'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 Santé Manitouswadge Health, we approve this Energy Conservation & Demand Management Plan.

This ECDM plan was created through a collaborative effort between Santé Manitouswadge Health and Blackstone Energy Services.

6 Appendix

6.1 Glossary of Terms

Word	Abbreviation	Meaning
Baseline Year		A baseline is a benchmark that is used as a foundation for measuring or comparing current and past values.
Building Automation System	BAS	Building automation is the automatic centralized control of a building's heating, ventilation and air conditioning, lighting and other systems through a building management system or building automation system (BAS)
Carbon Dioxide	CO ₂	Carbon dioxide is a commonly referred to greenhouse gas that results, in part, from the combustion of fossil fuels.
Energy Usage Intensity	EUI	Energy usage intensity means the amount of energy relative to relative to a buildings physical size typically measured in square feet.
Equivalent Carbon Dioxide	CO ₂ e	CO ₂ e provides a common means of measurement when comparing different greenhouse gases.
Greenhouse Gas	GHG	Greenhouse gas means a gas that contributes to the greenhouse effect by absorbing infrared radiation, e.g., carbon dioxide and chlorofluorocarbons.
Metric Tonnes	t	Metric tonnes are a unit of measurement. 1 metric tonne = 1000 kilograms
Net Zero		A net-zero energy building, is a <u>building</u> with zero net <u>energy consumption</u> , meaning the total amount of energy used by the building on an annual basis is roughly equal to the amount of <u>renewable energy</u> created on the site,
Variable Frequency Drive	VFD	A variable frequency drive is a device that allows for the modulation of an electrical or mechanical piece of equipment.

6.2 List of Figures, Tables and Pictures

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