Energy Conservation & Demand Management Plan 2024

Hôpital général de la baie Georgienne
GEORGIAN BAY
General Hospital

Contents

1. Executive Summary

The purpose of this Energy Conservation and Demand Management (ECDM) Plan from Georgian Bay General Hospital 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 Georgian Bay General Hospital's core values of efficiency, concern for the environment and financial responsibility, this ECDM outlines how Georgian Bay General 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 O. Reg. 25/23 of the recently amended Electricity Act, 1998.

Today, utility and energy related costs are a significant part of overall operating costs. In 2023:

- Energy Use Intensity (EUI) Index for included facilities was very high at 97.18
- Energy-related emissions equaled 1,893 tCO2e

To obtain full value from energy management activities, Georgian Bay General Hospital 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, by implementing recommended initiatives, Georgian Bay General Hospital can expect to achieve the following targets by 2029, compared with 2023:

- 18% reduction in electricity consumption
- 2% reduction in natural gas consumption
- 8% reduction in GHG emissions

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 The Bill repealed the GEA and all its underlying Regulations, including O. Reg. 397/11.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.

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.

Georgian Bay General Hospital's Energy Performance and Path Forward

The results and the progress of the ECDM activities implemented over the past five years, and the projected impact of the new ECDM Plan is presented in the graph below.

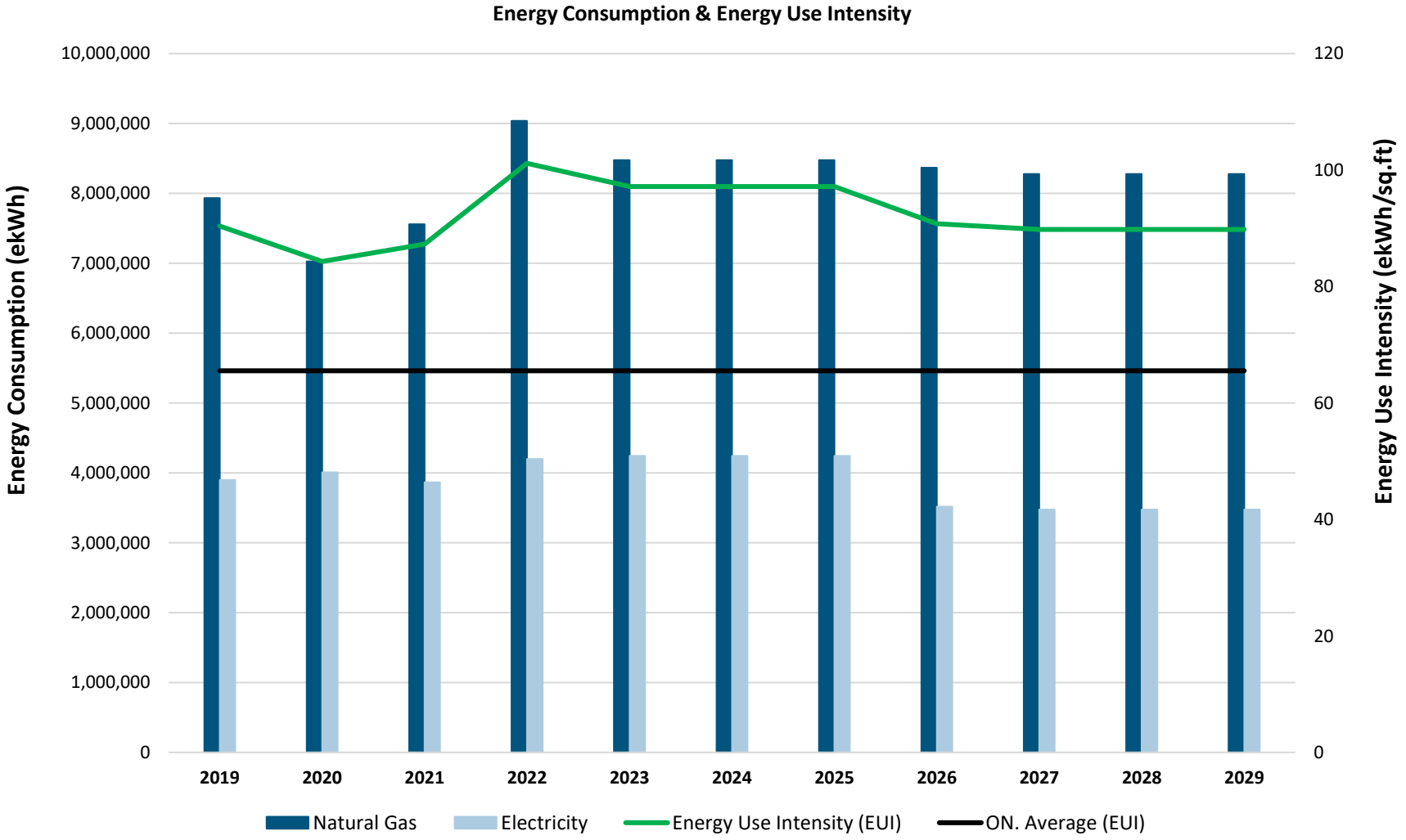

Figure 1. *Energy Consumption Trends & Projections*

3.About Georgian Bay General Hospital

Figure 2. *Georgian Bay General Hospital*

Our hospital serves 65,000 full-time residents and more than 150,000 residents and visitors during the summer months, from the communities of Midland and Penetanguishene, the Townships of Tiny, Tay, Springwater, Georgian Bay and Oro-Medonte, and the Beausoleil First Nation community on Christian Island. GBGH is a 113-bed acute care hospital with a full Emergency Department, Diagnostic Imaging, General Surgery, Obstetrics, Ambulatory Care, Complex Continuing Care and Rehabilitation, Dialysis and Outpatient Day Surgery.

Georgian Bay General Hospital	
Facility Name	**Georgian Bay General Hospital**
Type of Facility	Healthcare Facility
Address	1112 St Andrews Dr, Midland, ON L4R 4P4
Gross Area (Sq. Ft)	130,873
Average Operational Hours in a Week	168
Number of Beds	113
Number of Floors	2

Table 1. *Facility Information*

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. GBGH's green team will be actively engaged to support the energy management plan.

Our Vision

We Make Excellent Care Personal

Our Mission

- Continual Excellence
- Trust and Belonging
- Dedicated Team
- Sustainable Growth

Our Values

- Inspire Dedication: We show up every day with a commitment to caring for the health and wellbeing of our patients, our community, and each other.
- Patients First: We listen, work as a team, and collaborate with patients to create a safe and personalized care journey for all.
- Empower Others: We foster feelings of belonging by listening to and investing in our people, and by giving them space to grow.
- Lead with Empathy: We support our patients and their families by leading with compassion, respect, and the willingness to go the extra mile.
- Think Forward: We seek excellence through continuous improvement and innovation.

Figure 3. *Georgian Bay General Hospital Mission, Vision and Values*

4.Historical Site Analysis

4.1. 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 Canada's hospitals (derived from Natural Resources Canada's Commercial and Institutional Consumption of Energy Survey), which was found to be 65.53 ekWh/sq. Ft. GBGH's EUI at 97.18 kWh/sq. ft. is very high.

Year	2019	2020	2021	2022	2023
Total	90.40	84.30	87.27	101.15	97.18

***Table 2**. Historic Energy Use Intensity*

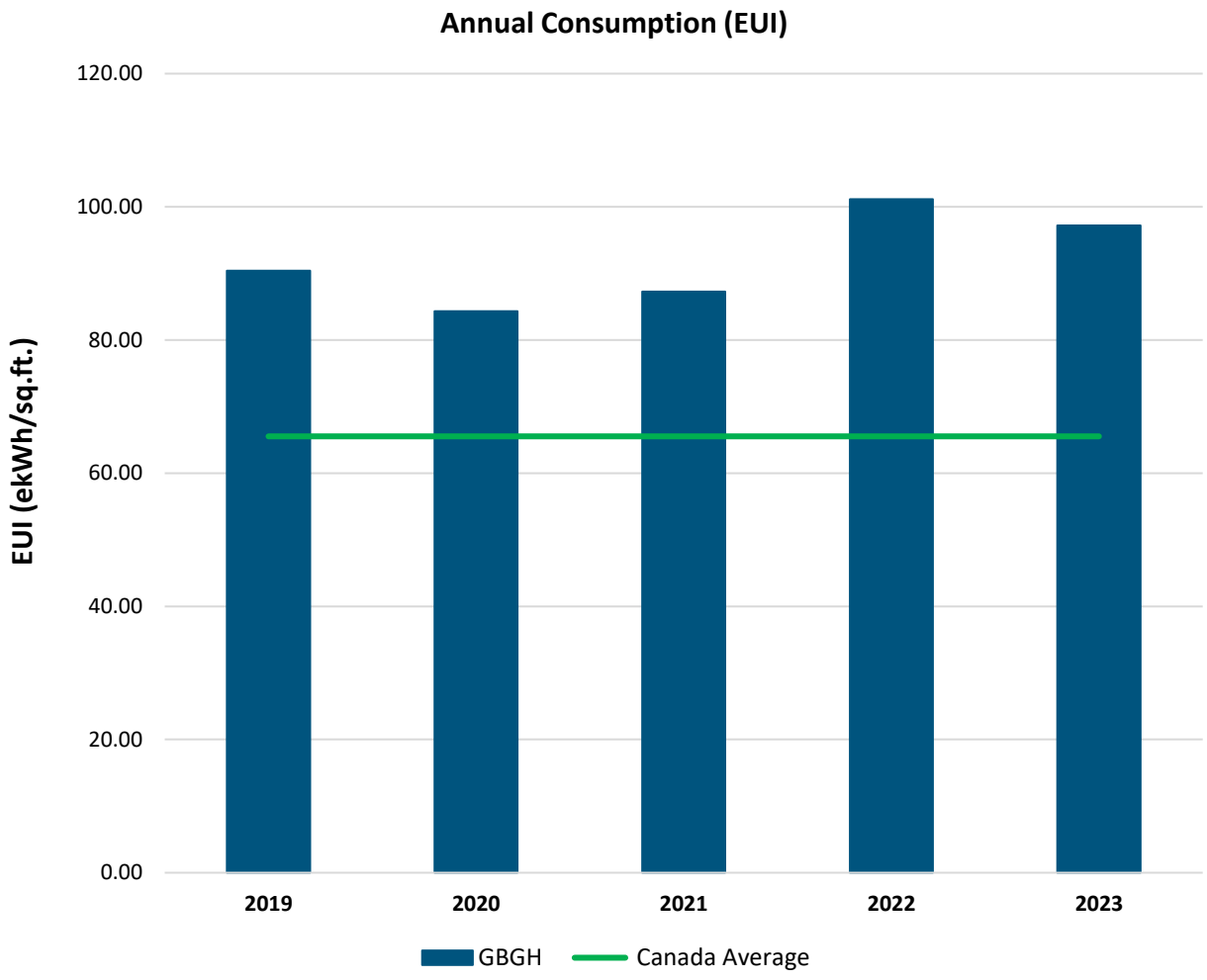

***Figure 4.** Historic Annual Energy Utilization Indices*

4.2. Historical Utility Consumption Analysis

Utilities to the site are electricity and natural gas. 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).

Year	2019	2020	2021	2022	2023
Electricity (kWh)	3,896,889	4,006,692	3,865,790	4,199,773	4,242,215
Natural Gas (m^3)	751,270	665,376	715,540	855,924	802,629

Table 3. *Historic Annual Utility Consumption*

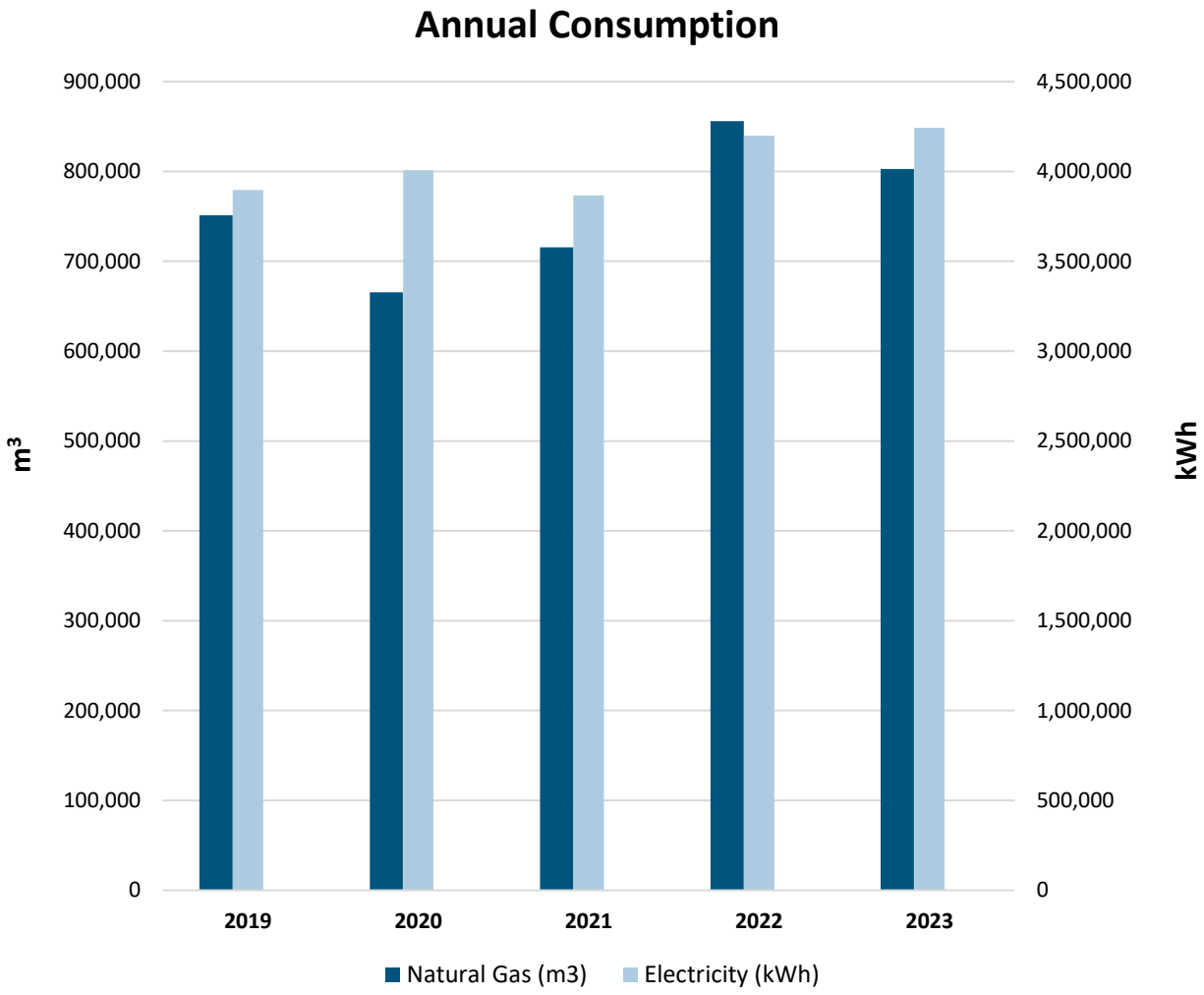

Figure 5. *Historic Annual Utility Consumption*

4.3. Historical GHG Emissions

Greenhouse gas (GHG) emissions are expressed in terms of equivalent tonnes of Carbon Dioxide (tCO_2e). 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 nuclear power and hydroelectricity, and coal-fired plants have been phased out. Scope 1 (such as natural gas directly used in facilities), and Scope 2 (such as purchased 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.

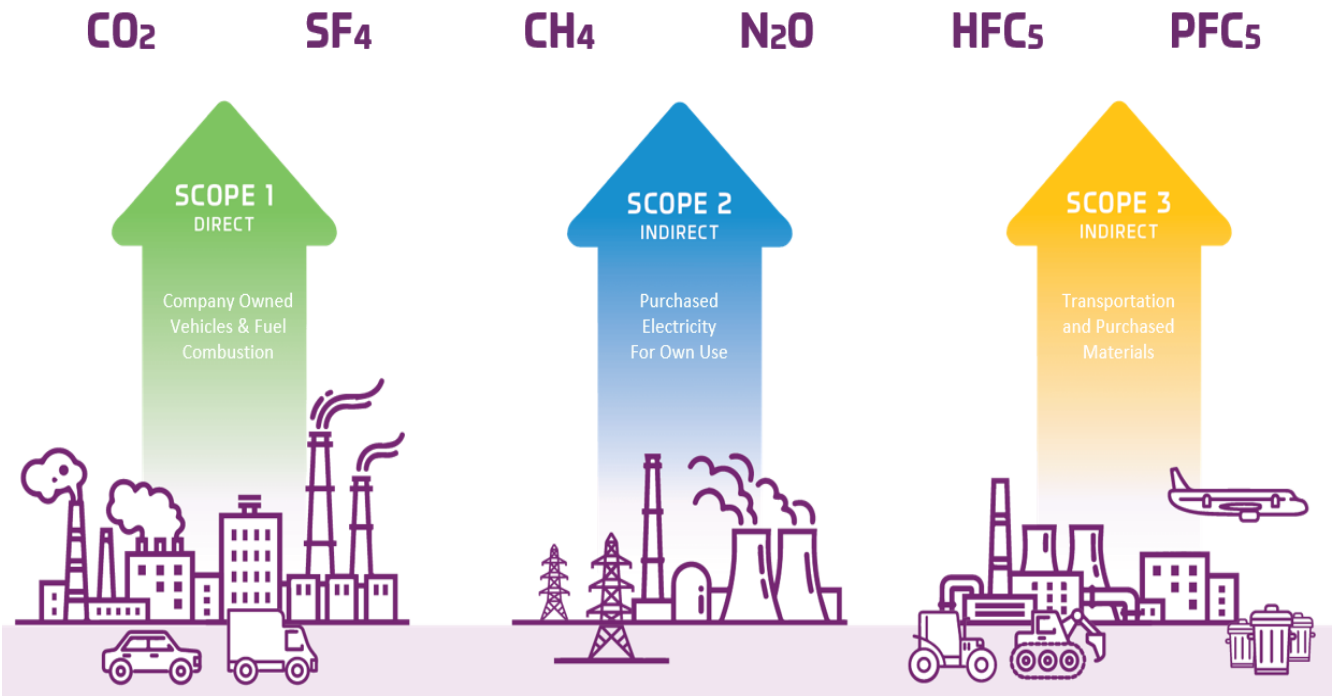

Figure 6. *Examples of Scope 1 and 2*

The greenhouse gas emissions for Georgian Bay General Hospital have been tabulated and are represented in the table and graph below.

GHG Emissions (tCO2e)	2019	2020	2021	2022	2023
Natural Gas (scope 1)	1,443	1,278	1,375	1,644	1,542
Electricity (scope 2)	97	103	101	297	351
Total Scope 1 & 2 Emissions	**1,541**	**1,382**	**1,476**	**1,941**	**1,893**

Table 4. *Historic Greenhouse Gas Emissions*

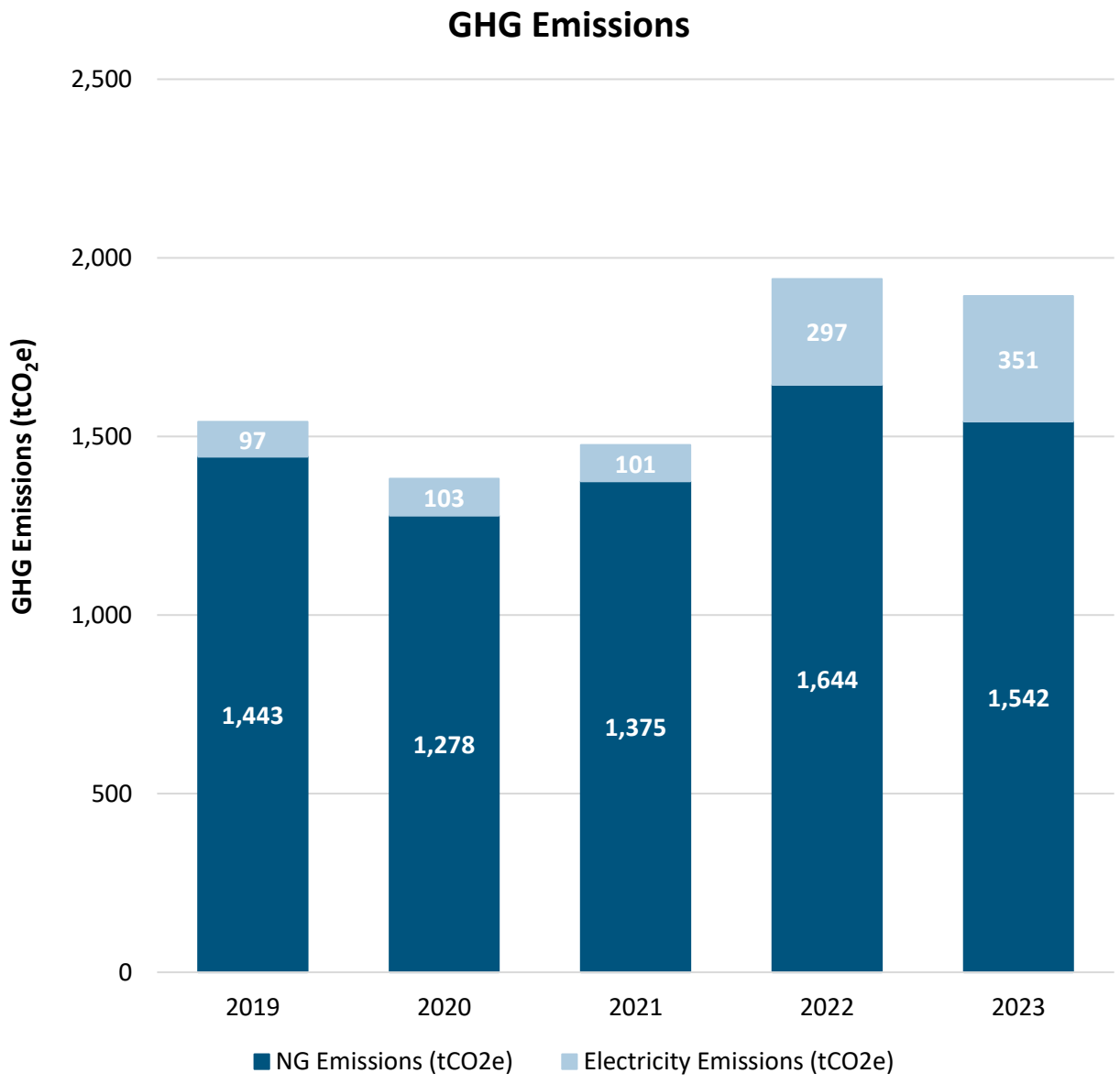

Figure 7. *Historical GHG Emissions*

5.Measures

5.1. Energy Conservation and GHG Reduction Strategies to Date

Over the previous years, Georgian Bay General Hospital has undertaken various energy conservation and demand management measures and GHG reduction initiatives. The summary of the main activities is shown in the following table.

Measure Name	Scope/Results
Replacement of Old AHU-s (AHU-1 and AHU-2)	These measures have resulted in more energy efficient and reliable operations and reductions in GHG emissions.
Installation of New High Efficiency Magnetic Bearing Chillers and New Cooling Towers	
Partial LED Lighting Retrofit	
Roof Sections Replacement with Upgraded R-Value	
Old AC Unit Replacement with Heat Pump (Cottage)	
New Chilled Water Plant Optimization	

Table 5. *Previous Sustainability Measures & Initiatives*

Figure 8. *GBGH Aerial*

5.2. Proposed Energy Conservation and GHG Reduction Measures

Our energy analysis has revealed potential for a number of conservation and GHG reduction strategies for the included facilities. Evaluated and proposed initiatives are summarized in the following table outlining savings potential of the targeted utilities, estimated project costs, and a recommended year of implementation for each measure, strategically chosen to maximize Georgian Bay General Hospital's energy conservation and GHG reduction benefits. Please see Appendix 1 for details about the proposed measures.

Measure	Estimated Annual Savings			Project Cost	Simple Payback (Years)	Implementation Year
	Electricity (kWh)	Natural Gas (m^3)	Cost ($)			
LED Retrofit w/ Occupancy Sensors and Dimmer Controls	238,641	-1,130	$28,185	$255,000	9.0	2026
Replacement of Old AHUs (Phase 2)	45,604	11,485	$10,066	$4,000,000	397.4	2026
Replacement of Old AHUs (Phase 3)	39,904	8,614	$8,234	$3,500,000	425.1	2027
403 kW Solar PV Rooftop System	441,000	0	$52,920	$800,000	15.1	2026
Total	**765,149**	**18,969**	**$99,406**	**$8,555,000**	**86.1**	**-**

Table 6. *Proposed Measures*

6.Georgian Bay General Hospital Outlook

6.1. Utility Consumption Forecast

By implementing the recommended measures stated in the previous section, in each respective site, Georgian Bay General Hospital's projected 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 on the data from the baseline year of 2023.

	2024		2025		2026		2027		2028		2029	
	Units	% Change	Units	% Change	Units	% Change	Units	% Change	Units	% Change	Units	% Change
Natural Gas (m^3)	802,629	0%	802,629	0%	792,274	1%	783,660	2%	783,660	2%	783,660	2%
Electricity (kWh)	4,242,215	0%	4,242,215	0%	3,516,970	17%	3,477,066	18%	3,477,066	18%	3,477,066	18%

Table 7. *Forecast of Annual Utility Consumption from 2024 to 2029*

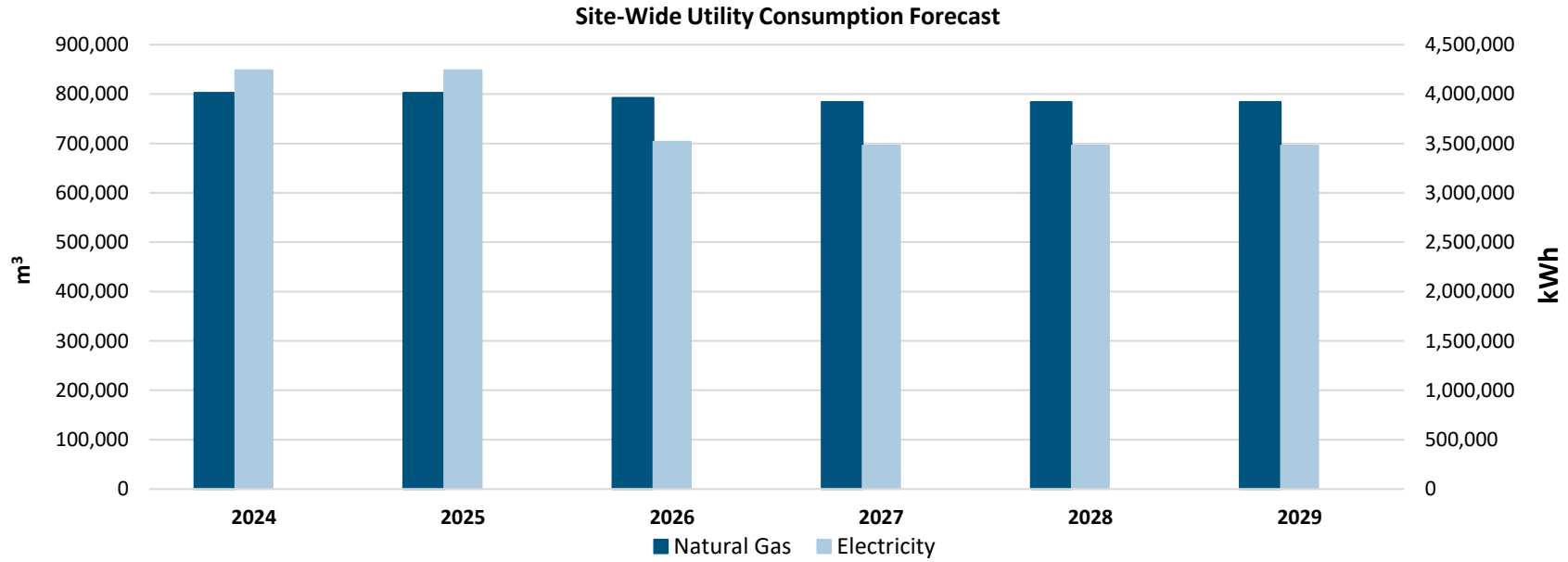

Figure 9. *Forecast of Annual Energy Consumption*

6.2. GHG Emissions Forecast

The organizational GHG emissions for Georgian Bay General Hospital are calculated based on the forecasted Site-wide energy consumption data analyzed in the previous section and are tabulated in the following table. The percentage reduction is based on the baseline year of 2023.

Utility Source (tCO2e)	2024	2025	2026	2027	2028	2029
Natural Gas (Scope1)	1,542	1,542	1,522	1,505	1,505	1,505
Electricity (Scope 2)	278	372	270	303	262	241
Totals	**1,820**	**1,914**	**1,792**	**1,808**	**1,768**	**1,746**
Reduction from Baseline Year	**4%**	**-1%**	**5%**	**4%**	**7%**	**8%**

Table 8. *Forecast of Annual Greenhouse Gas Emissions from 2024 to 2029*

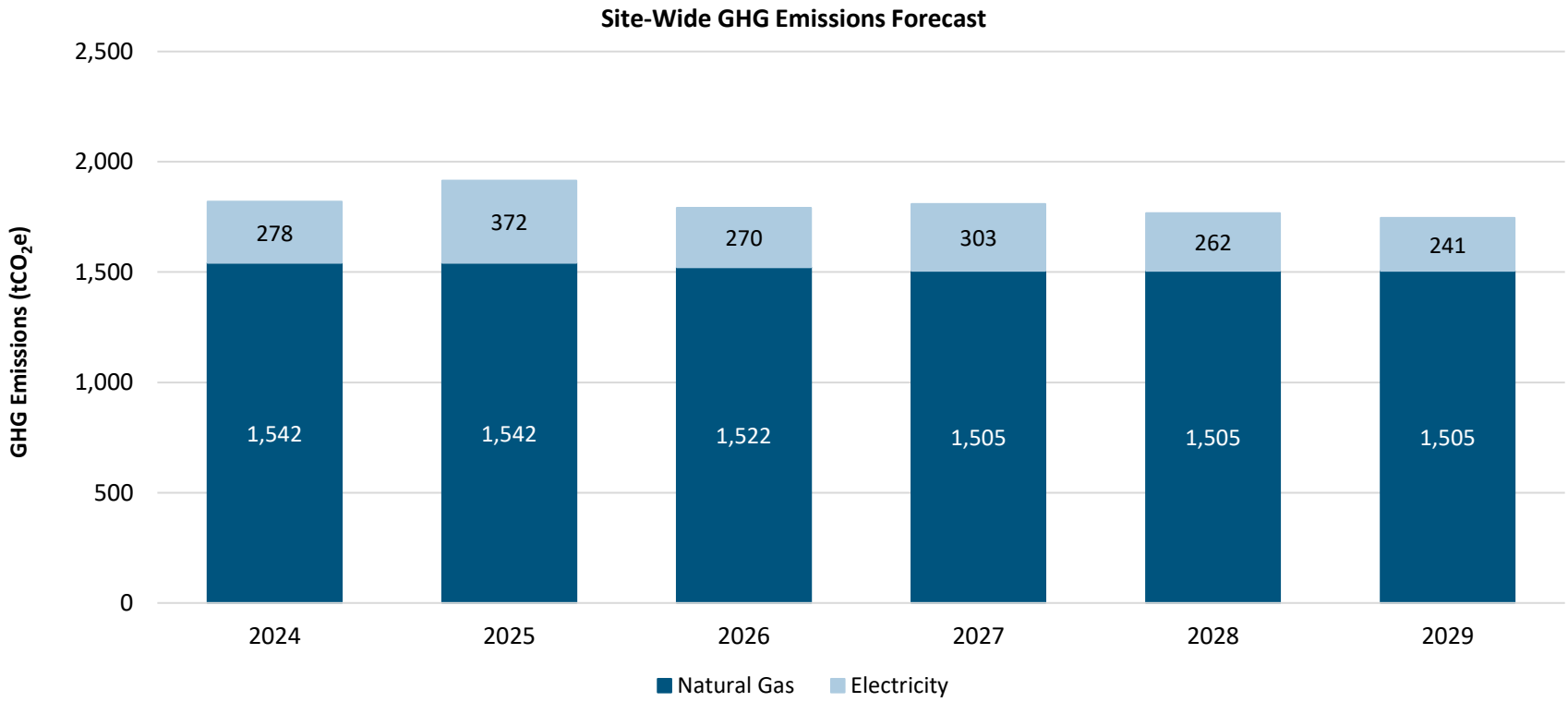

Figure 10. *Forecast of Annual Greenhouse Gas Emissions*

7.Closing Comments

Thank you to all who contributed to Georgian Bay General Hospital's Energy Conservation & Demand Management Plan. We consider our facilities 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 Georgian Bay General Hospital, we approve this Energy Conservation & Demand Management Plan.

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This ECDM plan was created through a collaborative effort between Georgian Bay General Hospital and Blackstone Energy Services.

8.Appendix 1

8.1. Glossary

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	CO2	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 a buildings physical size typically measured in square feet.
Equivalent Carbon Dioxide	CO2e	CO2e 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 building with zero net energy consumption, meaning the total amount of energy used by the building on an annual basis is roughly equal to the amount of renewable energy 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.

8.2. Tables and Figures

Tables

Figures