



# Energy Conservation & Demand Management Plan

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# Executive Summary

The purpose of this Energy Conservation and Demand Management (ECDM) Plan from Georgian Bay General Hospital (GBGH) 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 GBGH'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. It is recommended that GBGH produces a new ECDM plan in 2024.

Today, utility and energy related costs are a significant part of overall operating costs. In 2021:

- Energy Use Index was 99 ekWh/sq. ft, which is higher than Ontario average of 63 ekWh/sq. ft
- Energy-related emissions equaled 2,922 tCO<sub>2</sub>e

To obtain full value from energy management activities, GBGH 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 the recommended aggressive approach on the energy management, GBGH can expect to achieve the following targets by 2025 (with respect to the forecasted consumption of the present year, 2022):

- 20% reduction in electricity consumption
- 24% reduction in natural gas consumption
- 705 tCO<sub>2</sub>e decrease in GHG emissions
- Will continue to review opportunities for energy efficiency and conservation



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

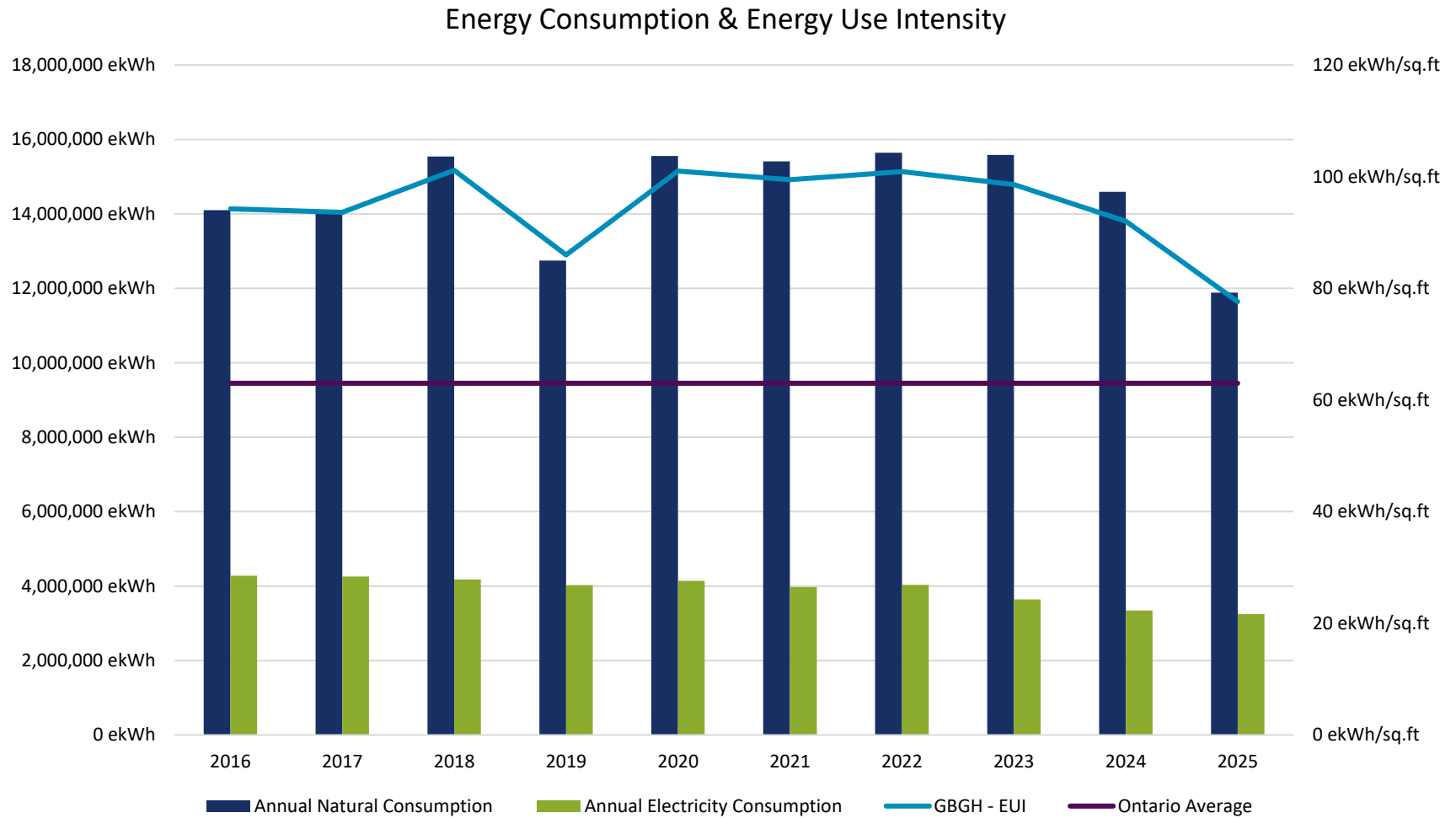


Figure 1. Energy Consumption Trends & Projections



# 1. 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.



## 2. About Georgian Bay General Hospital

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.

### ***Our Vision***

Inspiring generosity. Strengthening health care. Celebrating impact.

### ***Our Mission***

To empower Georgian Bay General Hospital to deliver exceptional health care.

### ***Our Values***

We CARE.

#### **Collaboration**

We enthusiastically embrace partnership with others to achieve our mission.

#### **Accountability**

We act with honesty, integrity and transparency with the resources entrusted to us.

#### **Respect**

We commit to use the strength of our differences to embrace each person's uniqueness, with a spirit of inclusivity, diversity and equality.

#### **Excellence**

We strive to achieve transformational fundraising results, deliver exemplary stewardship and embrace change with innovative thinking.





Figure 2. Georgian Bay General Hospital

Georgian Bay General Hospital came into existence following the voluntary integration of Huronia District Hospital and Penetanguishene General Hospital in 2008. We are the regional tertiary care center in Midland Ontario, with 800 dedicated and resilient employees, 220 highly skilled medical staff and scientists, 50-100 learners/physical assistants/residents per year, and 120 active volunteers

Facility Information	
Facility Name	Georgian Bay General Hospital
Address	1112 St Andrews Dr, Midland, ON L4R 4P4
Gross Area (Sq. Ft)	194,999
Number of Floors	2
Facility Type	The facility provides both acute and chronic patient care

Table 1. GBGH Facility Information



### 3. Historical Site Analysis

#### 3.1. Historical Energy Intensity

Energy Utilization Index (EUI) 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 **63ekWh/sq. ft.**

Annual EUI (ekWh/sq. ft)						
Site	2016	2017	2018	2019	2020	2021
<b>GBGH</b>	94	94	101	86	101	99

Table 2. Historic Annual Energy Utilization Indices

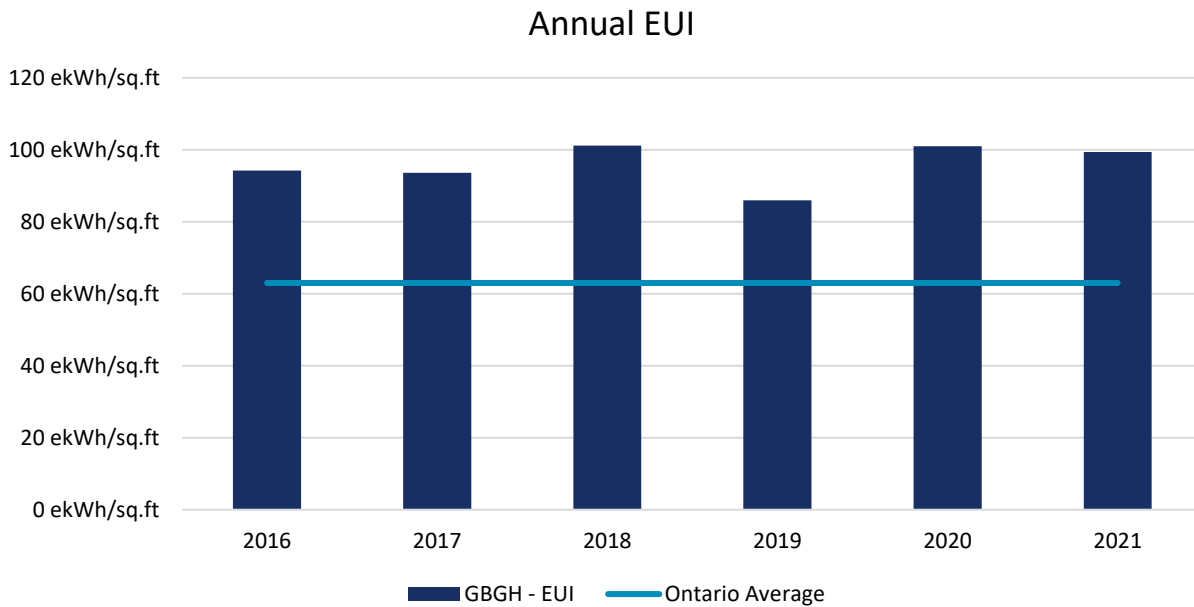


Figure 3. Historic Annual Energy Utilization Indices





## 3.2. Historical GHG Emissions

Greenhouse gas (GHG) emissions are expressed in terms of equivalent tonnes of Carbon Dioxide (tCO<sub>2</sub>e). 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 (natural gas) 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.

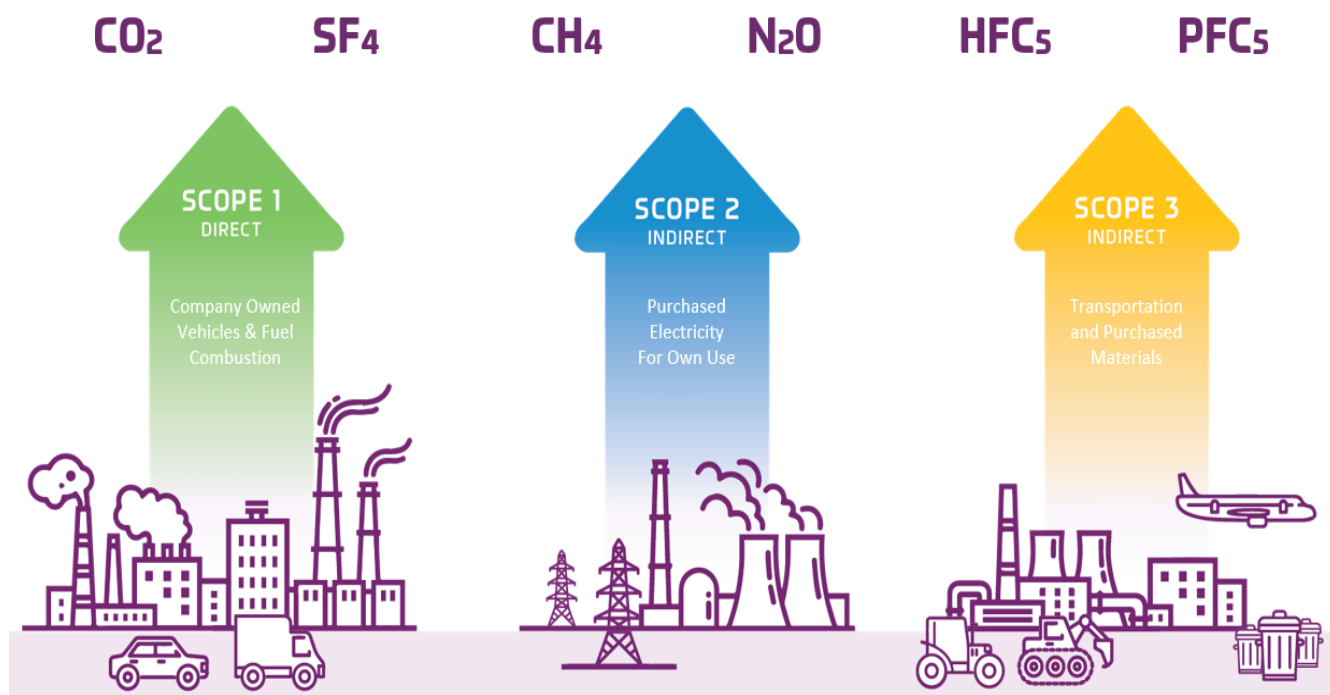


Figure 4. Examples of Scope 1 and 2



The greenhouse gas emissions for GBGH have been tabulated and are represented in the table and graph below.

GHG Emissions (tCO <sub>2e</sub> )	2016	2017	2018	2019	2020	2021
<b>Electricity (Scope 2)</b>	176	175	171	165	170	163
<b>Natural Gas (Scope 1)</b>	2,523	2,505	2,782	2,281	2,785	2,759
<b>Total Scope 1 &amp; 2 Emissions</b>	2,699	2,680	2,953	2,446	2,954	2,922

Table 3. Historic Greenhouse Gas Emissions

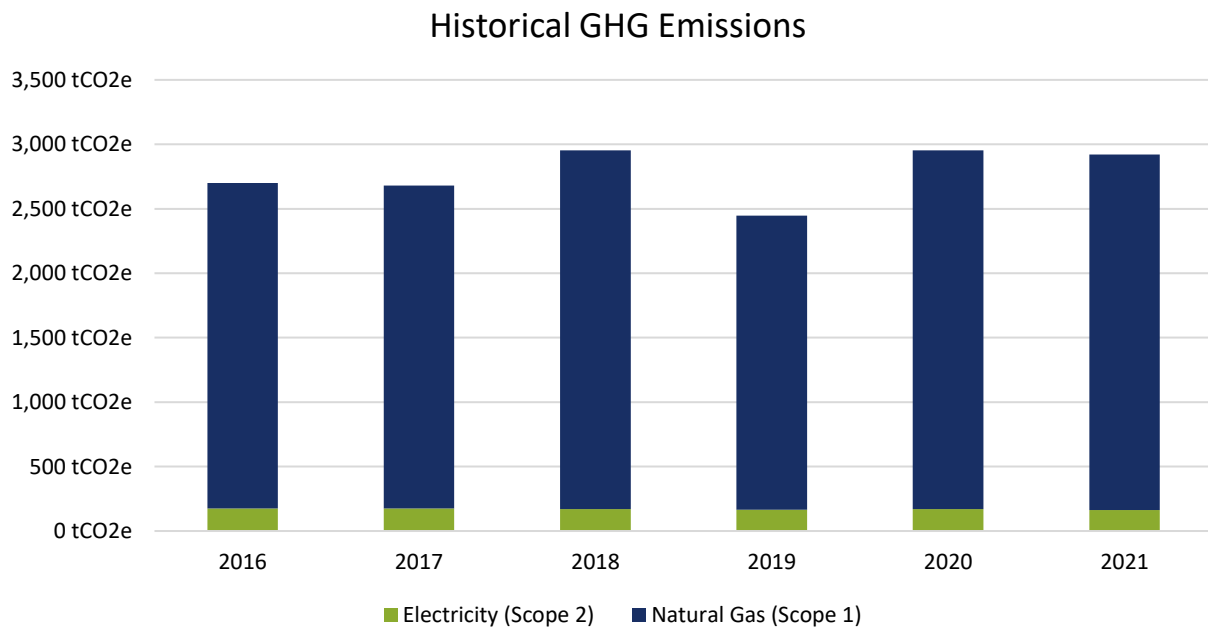


Figure 5. Historic Greenhouse Gas Emissions



### 3.3. Historical Utility Consumption

Utilities to the Campus 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).

Annual Consumption (units)						
Utility	2016	2017	2018	2019	2020	2021
<b>Electricity (kWh)</b>	4,282,695	4,256,965	4,180,096	4,026,179	4,139,667	3,977,353
<b>Natural Gas (m<sup>3</sup>)</b>	1,335,026	1,325,384	1,471,946	1,206,887	1,473,297	1,459,595

Table 4. Historic Annual Utility Consumption

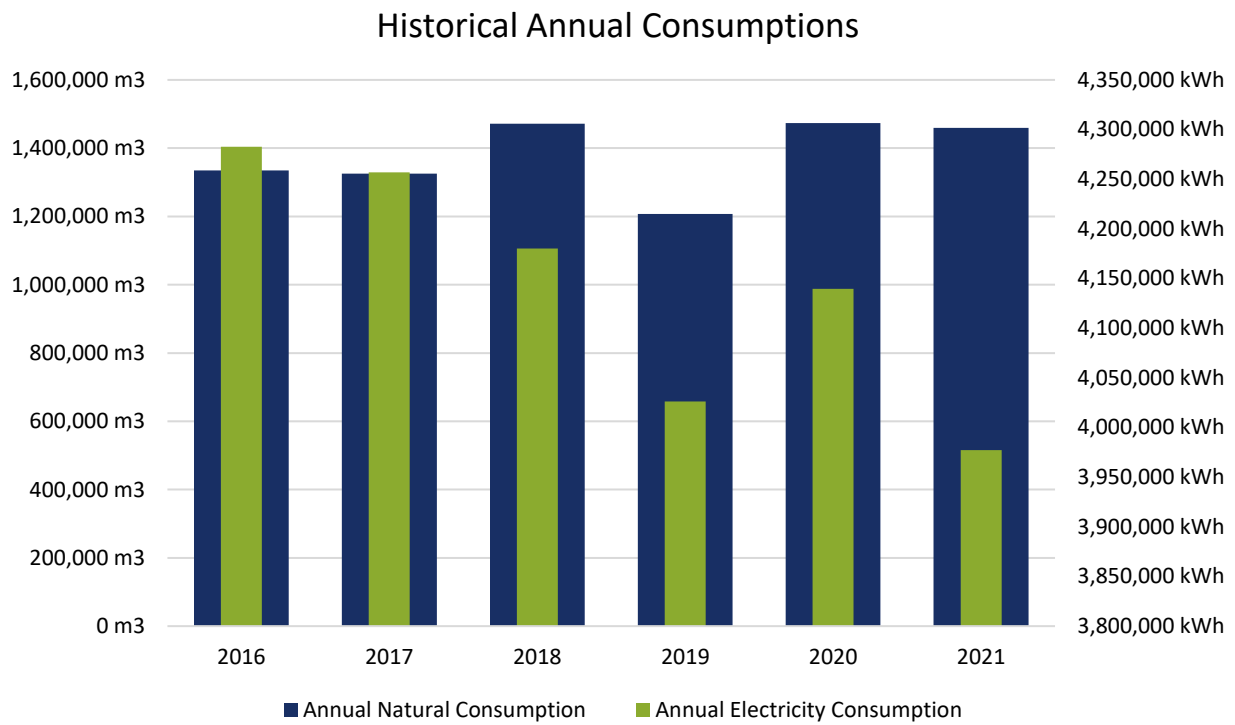


Figure 6. Historic Annual Utility Consumption



## 4. Proposed Conservation Measures

Our energy analysis has revealed several conservation strategies for the facility. GBGH’s proposed energy saving initiatives are summarized in the table below outlining the targeted utilities. The implementation for these measures is dependent on funding availability, government incentives and operational decisions.

Measure	Investment	Estimated Annual Savings		Recommended Year of Implementation
		kWh	m3	
BAS Recommissioning/Upgrade with AI Integration	\$1,800,000	99,434	36,490	2024
LED Retrofit w/ Occupancy Sensors and Dimmer Controls	\$425,000	397,735	-1,883	2023
Building Envelope Thermal Assessment & Upgrades	\$2,500,000	77,558	28,924	2024
Replacement of Old AHUs	\$5,000,000	114,011	28,712	2024
Geothermal System	\$4,750,000	-345,414	256,510	2025
403kW Solar Rooftop	\$1,500,000	441,000	-	2025
Solar Wall	\$234,000	-	7,298	2023
<b>Total</b>	<b>\$16,209,000</b>	<b>784,324</b>	<b>356,051</b>	<b>-</b>

Table 5. Proposed Conservation Measures



## 5. Consumption Forecasting

### 5.1. 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 2021.

Annual Consumption								
	2022		2023		2024		2025	
	Units	% Change	Units	% Change	Units	% Change	Units	% Change
Electricity (kWh)	4,037,013 kWh	0%	3,639,278 kWh	10%	3,348,275 kWh	17%	3,252,688 kWh	19%
Natural Gas (m <sup>3</sup> )	1,481,489 m <sup>3</sup>	0%	1,476,074 m <sup>3</sup>	0%	1,381,948 m <sup>3</sup>	7%	1,125,439 m <sup>3</sup>	24%

Table 6. Forecast of Annual Utility Consumption

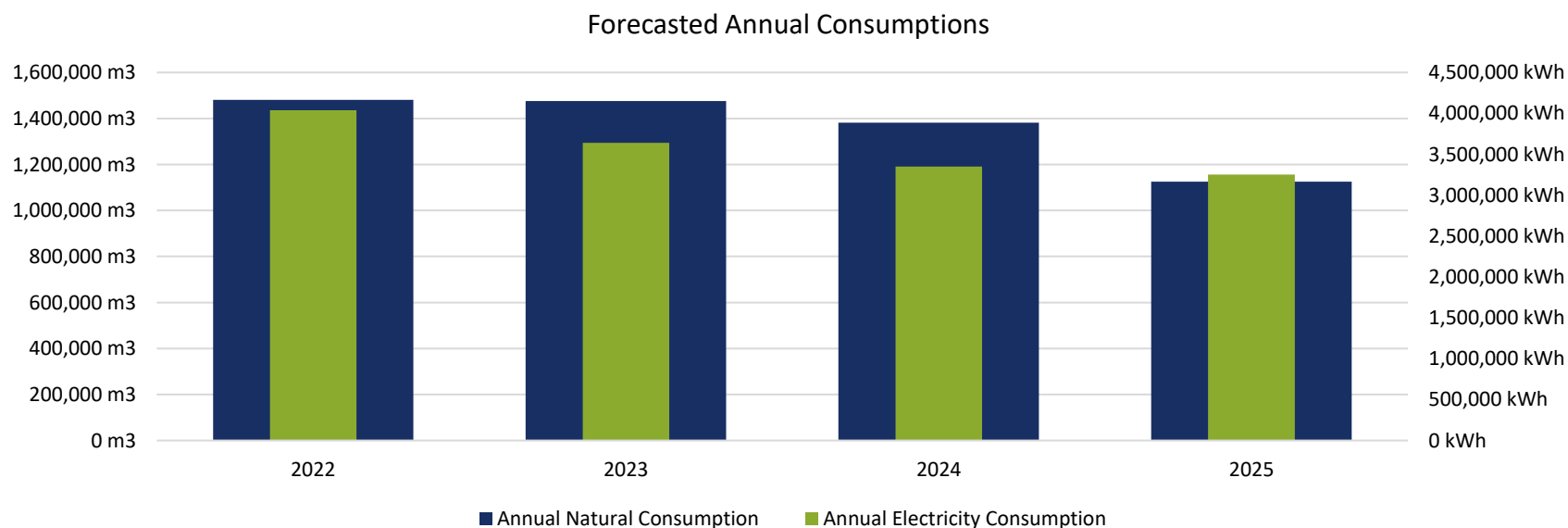


Figure 7. Forecast of Annual Utility Consumption



## 5.2. 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 2021.

GHG Emissions (tCO <sub>2</sub> e)					
Utility Source	2021	2022	2023	2024	2025
Electricity	163	166	149	137	133
Natural Gas	2,759	2,800	2,790	2,612	2,127
<b>Totals</b>	<b>2,922</b>	<b>2,966</b>	<b>2,939</b>	<b>2,749</b>	<b>2,260</b>
<b>Reduction from Baseline Year (2021)</b>	<b>0</b>	<b>-44 *</b>	<b>-17</b>	<b>173</b>	<b>661</b>

\*Electricity consumption is seen to increase in 2022 due to escalation rate including loss of efficiency of the HVAC equipment and wear and tear. Baseline year is taken as 2021 but the implementation period is considered to begin from 2023.

Table 7. Forecast of Annual Greenhouse Gas Emissions

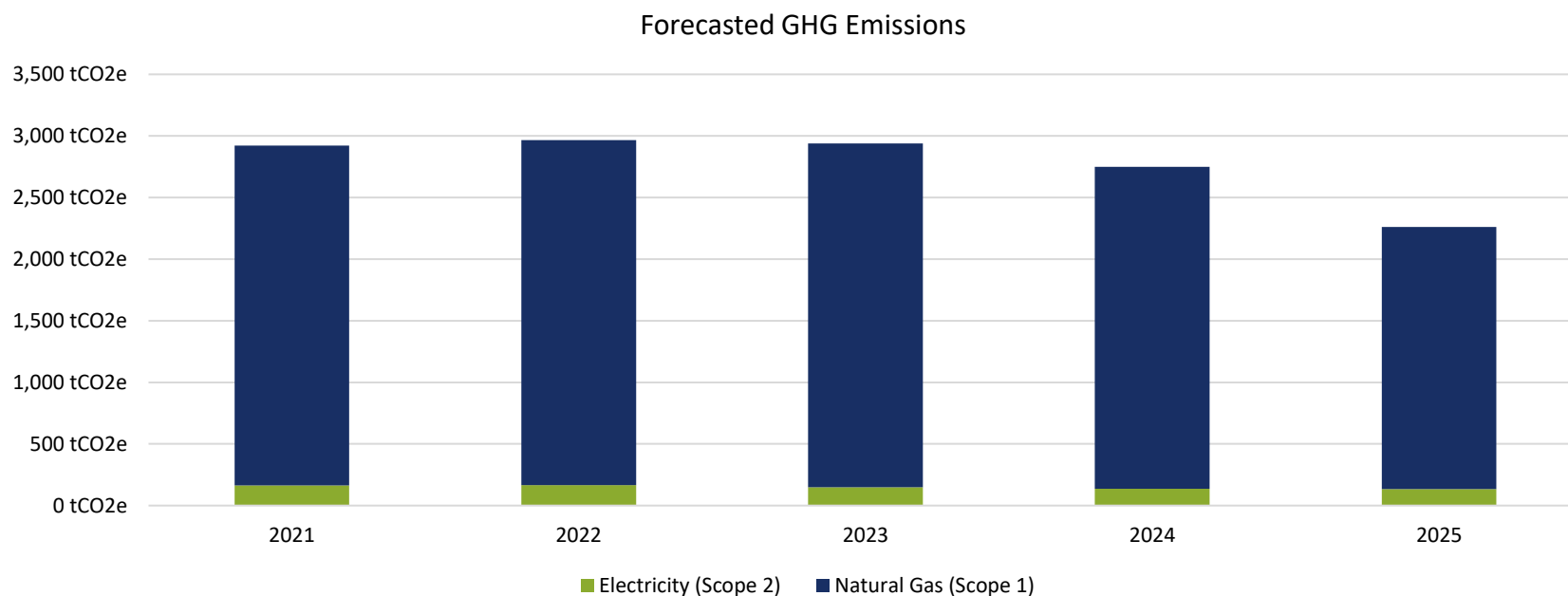


Figure 8. Forecast of Annual Greenhouse Gas Emissions



## 6. Closing Comments

Thank you to all who contributed to Georgian Bay General Hospital's Energy Conservation & Demand Management Plan. We consider our facility a primary source of healthcare, 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 Georgian Bay General Hospital, we approve this Energy Conservation & Demand Management Plan.

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

