



Energy Conservation & Demand Management Plan 2019



Executive Summary

The purpose of this Energy Conservation and Demand Management (ECDM) Plan from Collingwood General and Marine Hospital (“CGMH”) 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 CGMH’s core values of accountability, respect and excellence, 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, CGMH has achieved the following results since 2013:

- 402,917 kwh reduction in electricity use
- 112,556 m³ reduction in natural gas use
- >14% 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 70 ekWh/sq.ft
- Energy-related emissions equaled 1,168 tCO₂e

To obtain full value from energy management activities, CGMH 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, CGMH can expect to achieve the following targets by 2024:

- ~ 11% reduction in electricity consumption
- ~ 16% reduction in natural gas consumption
- 177 tCO₂e carbon equivalent emissions

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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.

Collingwood General and Marine Hospital is an integral part of the North Simcoe Muskoka Local Health Integration Network. By working co-operatively with other hospitals, CGMH can maximize its efficiencies, reduce costs and ensure that the people of the area are educated about their own health and always have access, within the region, to the health services they require.

Our Vision

Outstanding care – for life.

Our Mission

Advancing community health through compassionate, innovative and collaborative care.

Our Values

“I CARE AT CGMH”

I – Inclusive

C – Caring

A – Accountable

R – Respectful

E – Excellence

A – Adaptable

T – Teamwork

CGMH

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 Collingwood General and Marine Hospital



Picture 1. Collingwood General and Marine Hospital

The Collingwood General and Marine hospital serves the “Georgian Triangle”, which encompasses Collingwood, Wasaga Beach, Clearview Township, and the Blue Mountains. We strive to provide quality care close to home for our community and ensure that the people of the area are educated about their own health and always have access. We are committed to providing a welcoming community atmosphere.

Facility Overview	
Facility Name	Collingwood General and Marine Hospital
Type of Facility	Healthcare Services
Address	459 Hume Street, Collingwood, ON
Gross Area (sq. ft.)	135,174

Table 1. Collingwood General and Marine Hospital 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
Collingwood General and Marine Hospital	81	79	80	74	75	70

Table 2. Historic Energy Intensity

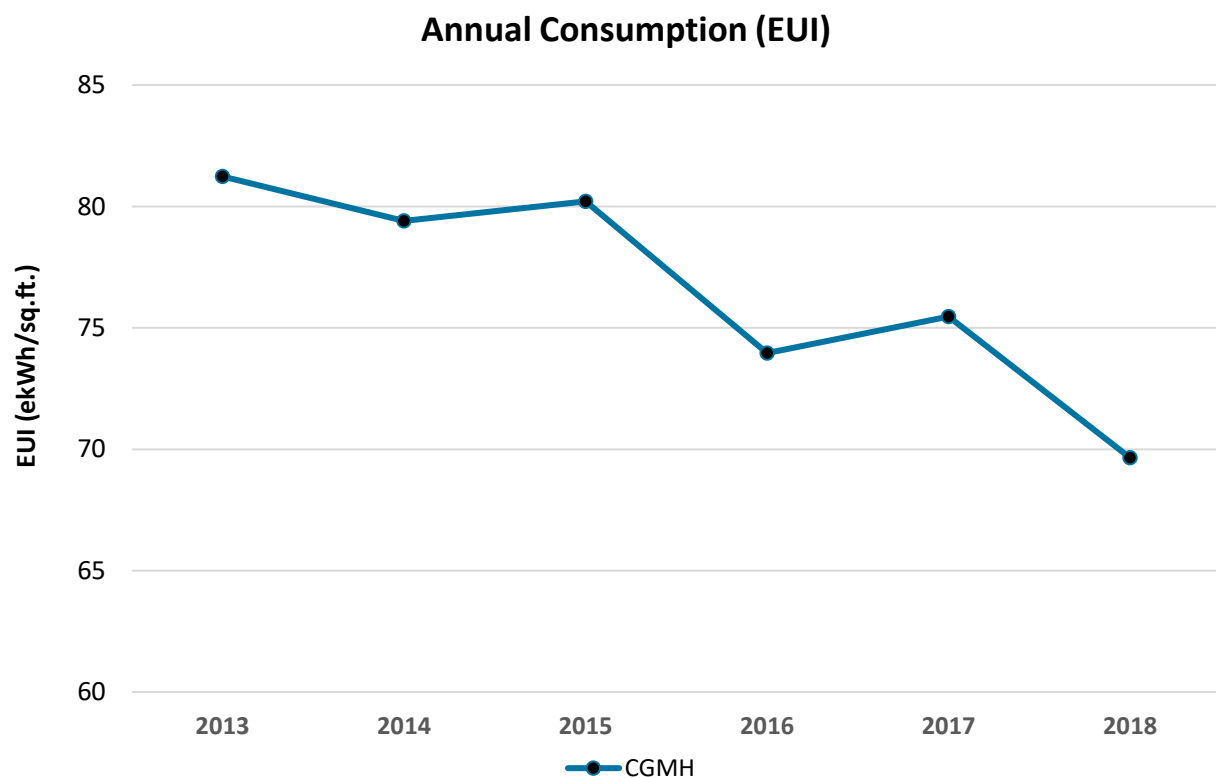


Figure 1. Historic Energy Intensity

3.2 Sustainability Strategies to Date

CGMH is continuously reviewing opportunities to improve operational and system efficiency. CGMH's previously completed energy and water saving initiatives are listed below:

- Formation of a Green Team to raise awareness with stakeholders
- Annual steam trap survey to ensure proper functionality
- All Exterior parking lot pole lights, wall packs and sign lights have been converted to LED since April 2016. This reduced the electricity consumption of the exterior lighting system by 30%.
- Energy efficient window coating pilot program
- Work with our energy procurement agent to accurately forecast future costs and potential cost avoidance.
- High efficiency steam boiler replacement - One new boiler and heat recovery installed March 2017. Remaining Two boilers replaced March 2018.
- Air Compressor Upgrade - Main building compressor for pneumatic controls upgraded in March 2017.
- New Refrigeration Compressor - Refrigeration compressors for main walk-in freezer replaced March/April 2019.
- One 7.5 HP terminal reheat pump VSD and one 3HP radiator VSD installed.

4 Site Analysis



Picture 2. Collingwood General and Marine Hospital

The Collingwood General and Marine Hospital opened in 1887 and is currently a 74-bed facility that serves more than 60,000 residents and 3.5 million annual visitors. We serve the communities of Wasaga Beach, Collingwood, Clearview and the Blue Mountains. We are an acute care hospital providing emergency care, diagnostic services including lab, imaging and cardio respiratory therapy, as well as two inpatient units (medicine and surgery).

Facility Information	
Facility Name	Collingwood General and Marine Hospital
Type of Facility	Healthcare Services
Address	459 Hume Street, Collingwood, ON
Gross Area (sq.ft)	135,174
Average Operational Hours in a Week	168
Number of Beds	70
Number of Floors	3

Table 3. Collingwood General and Marine Hospital 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 cubic metre of natural gas would be converted into the equivalent amount of the energy contained in a kilowatt hour of electricity.

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).

Annual Consumption (units)						
Year	2013	2014	2015	2016	2017	2018
Electricity (kWh)	4,308,651	4,154,617	4,132,494	3,873,749	4,163,066	3,905,734
Natural Gas (m ³)	645,902	636,880	649,562	592,894	584,481	533,346

Table 4. Historic Annual Utility Consumption

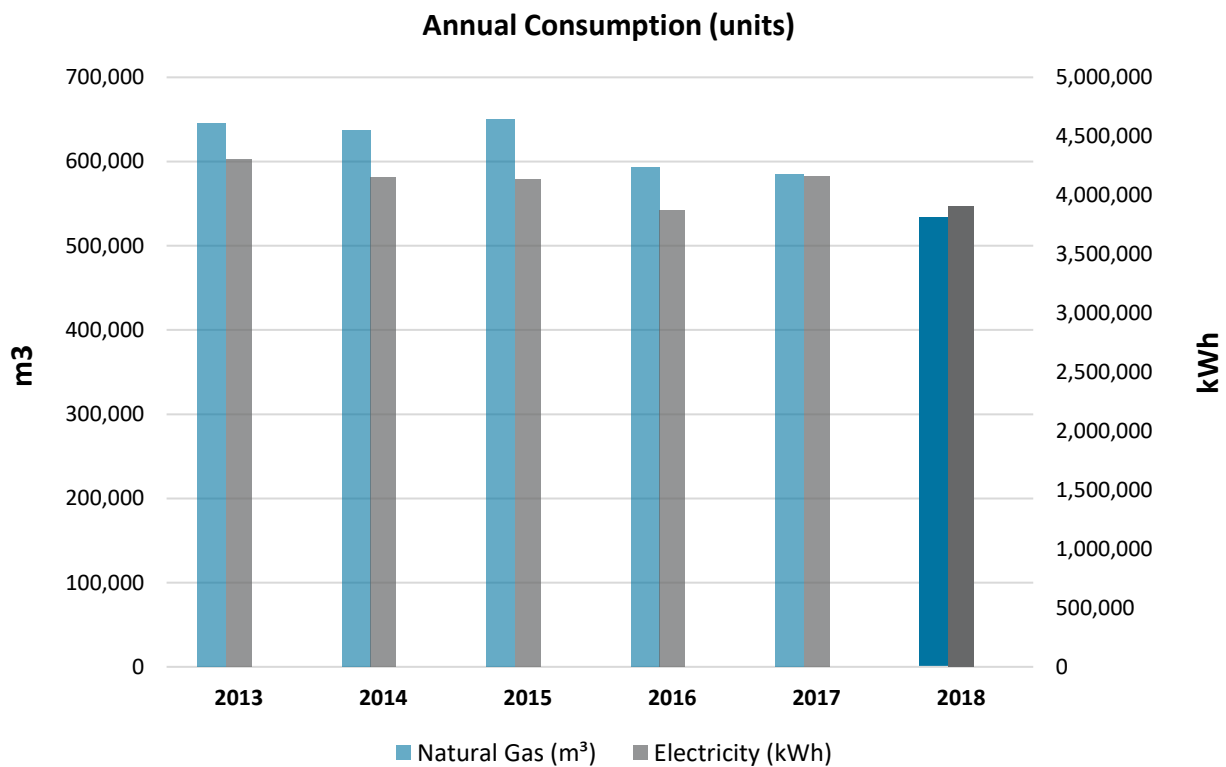


Figure 2. Historic Annual Utility Consumption

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 (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.

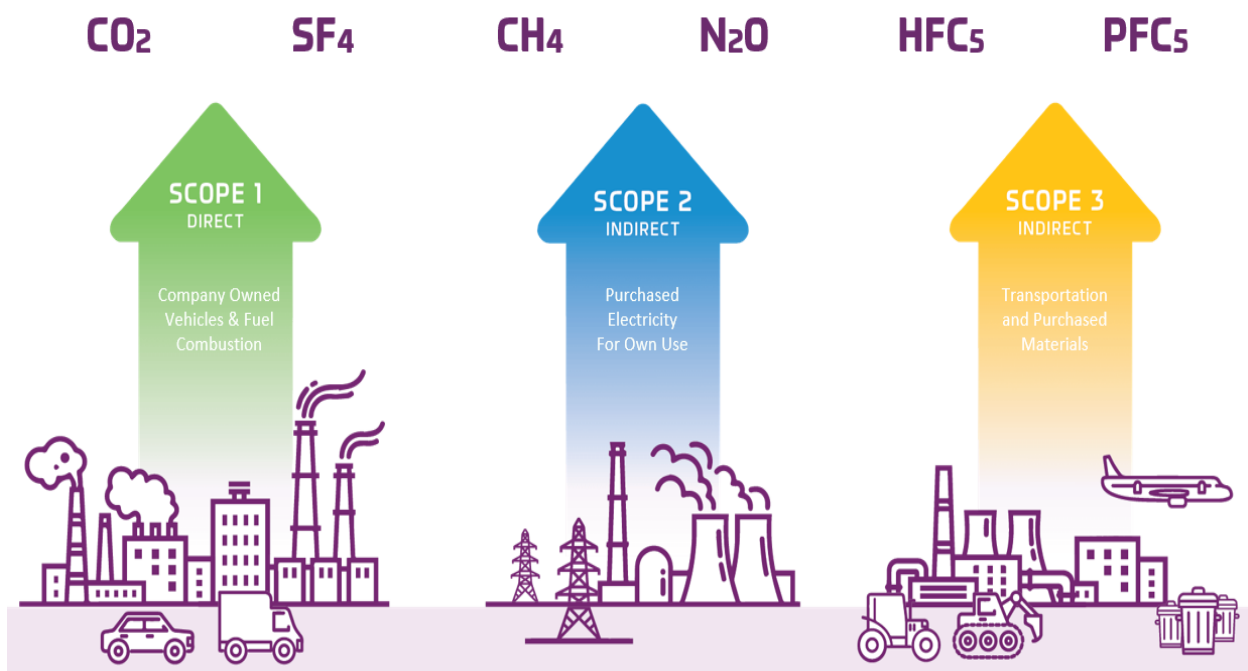


Figure 3. Examples of Scope 1 and 2

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

GHG Emissions	2013	2014	2015	2016	2017	2018
Electricity (scope 2)	177	170	169	159	171	160
Natural Gas (scope 1)	1,221	1,204	1,228	1,121	1,105	1,008
Totals	1,397	1,374	1,397	1,279	1,275	1,168

Table 5. Historic Greenhouse Gas Emissions

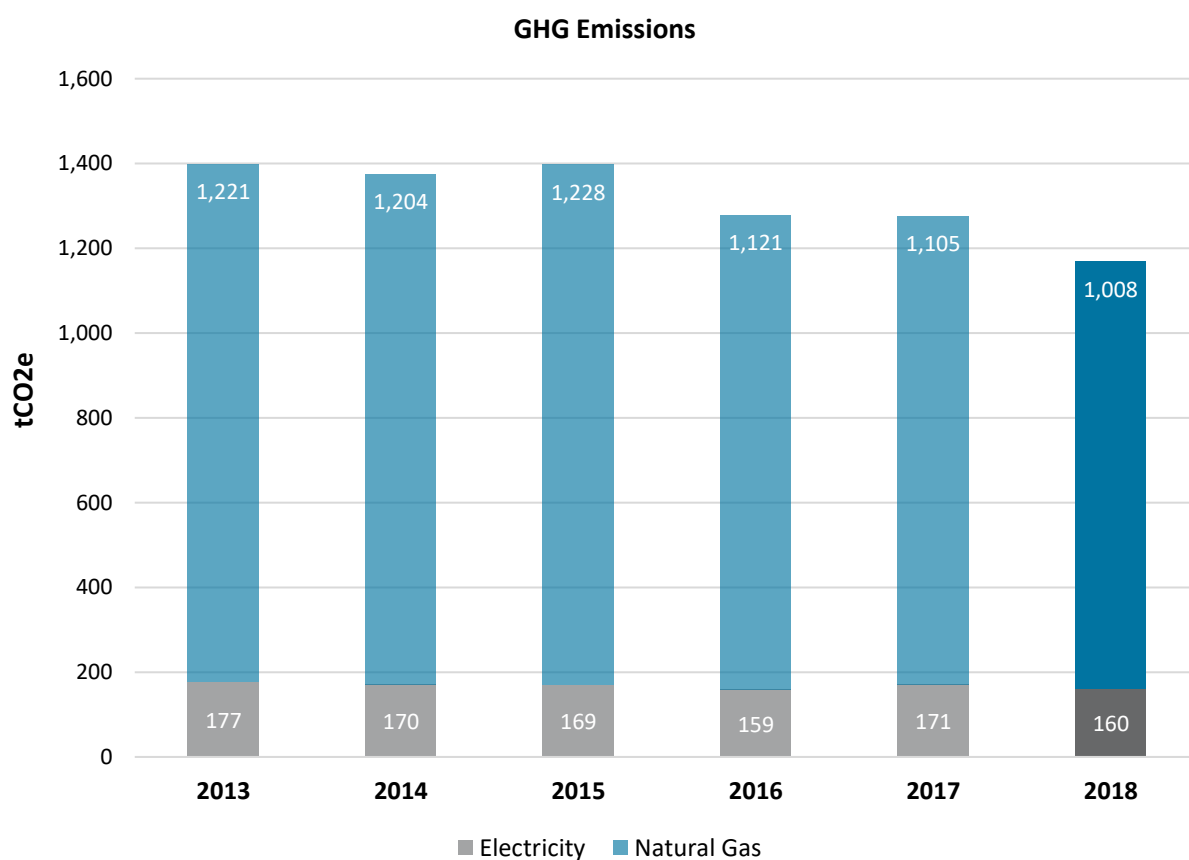


Figure 4. Historic Greenhouse Gas Emissions

4.3 Proposed Conservation Measures

Our energy analysis has revealed several conservation opportunities for the facility, which should be considered strongly if funds become available and in relation to future hospital planning. CGMH's proposed energy 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)	Proposed Year of Implementation
		kWh	kW	m3		
LED Lighting Upgrades	Electricity	216,000	74	0	7.83	2019
Reduce Outdoor Air in MAUs	Natural Gas	0	0	7,090	17.66	2021
Outdoor Air and Airflow Control Surgery	Electricity & Natural Gas	5,409	0	3,261	29.85	2023
Continuous Commissioning HVAC Equipment	Electricity & Natural Gas	99,564	0	19,518	6.91	2020
Weather Striping & Caulking	Natural Gas	0	0	16,000	14.06	2023
Piping and Accessories Insulation	Natural Gas	0	0	26,667	10.97	2023
Install Heat Recovery System	Natural Gas	0	0	11,949	10.21	2019
Chiller Replacement & OR Chiller	Electricity	90,304	0	0	55.62	2020
Totals		411,277	74	84,485		

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)	3,905,734	0%	3,499,867	10%	3,499,867	10%	3,499,867	10%	3,494,457	11%	3,494,457	11%
Natural Gas (m ³)	533,346	0%	501,879	6%	494,789	7%	494,789	7%	448,861	16%	448,861	16%

Table 7. Forecast for Annual Utility Consumption

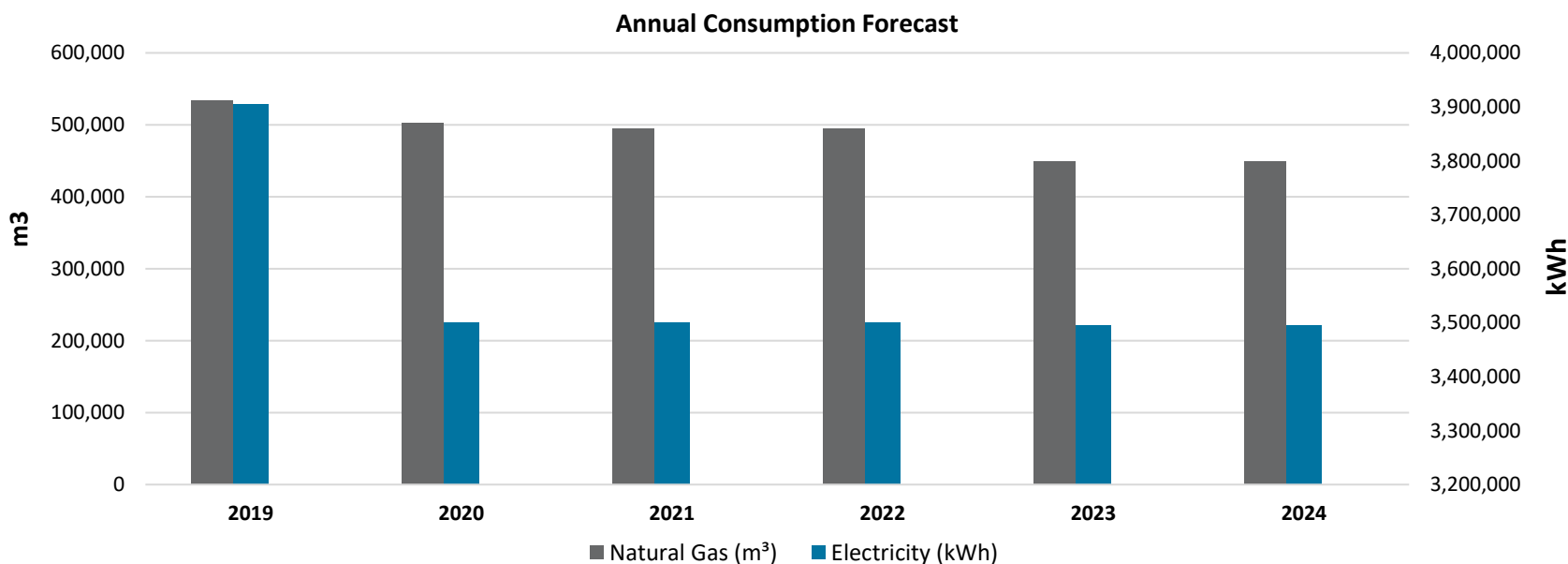


Figure 5. Forecast for Annual Utility Consumption

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	160	143	143	143	143	143
Natural Gas	1,008	949	935	935	848	848
Totals	1,168	1,092	1,079	1,079	992	992
Reduction from Baseline Year (2018)	0.00%	6.52%	7.66%	7.66%	15.11%	15.11%

Table 8. Forecast for Annual Greenhouse Gas Emissions

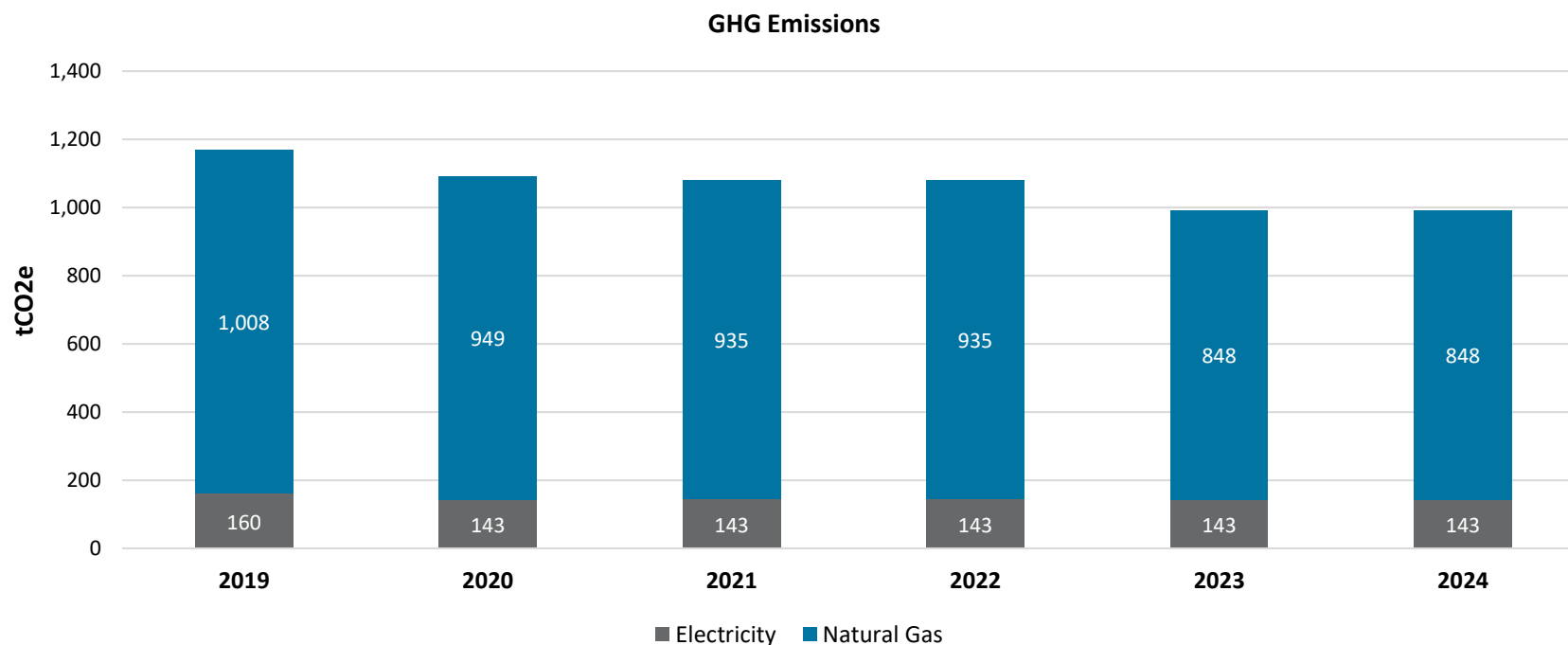


Figure 6. Forecast for Annual Greenhouse Gas Emissions

5 Closing Comments

Thank you to all who contributed to Collingwood General and Marine Hospital'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 Collingwood General and Marine Hospital, we approve this Energy Conservation & Demand Management Plan.

This ECDM plan was created through a collaborative effort between Collingwood General and Marine Hospital 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 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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