



**ENERGY CONSERVATION &  
DEMAND MANAGEMENT PLAN  
2019**



# Executive Summary

The purpose of this Energy Conservation and Demand Management (ECDM) Plan from Atikokan General Hospital (“AGH”) 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 AGH’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.

Since 2014, Atikokan General Hospital has achieved the following results:

- 187,909 kwh increase in electricity use
- 51,134 m<sup>3</sup> increase in natural gas use
- 13% increase in the hospital’s total energy intensity since 2013

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

- AGH’s Energy Use Index (EUI) was 68 ekWh/sq.ft.
- Energy-related emissions equaled 612 tCO<sub>2</sub>e

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

- ~ 10% reduction in electricity consumption
- 4 tCO<sub>2</sub>e reduction in 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.

Atikokan General Hospital is a team of qualified, engaged employees providing quality and timely health outcomes. In partnership with others we strive to provide equitable and accessible programs as close to home as reasonably possible. We are committed to patient-centered care through skilled knowledge and leadership, financial sustainability and effective governance.

## *Our Mission*

Atikokan General Hospital is dedicated to excellence in compassionate and supportive health care for those we serve.

## *Our Vision*

A community providing health care closer to home.

## *Our Values*

Atikokan General Hospital will provide high quality health care that promotes wellness and safety and appropriate health services.

## 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 Atikokan General Hospital



Picture 1. Atikokan General Hospital

AGH provides service to all residents of Atikokan and the surrounding area. We administer and operate community-based programs including mental health counselling and addictions program, and diabetes counselling. Hospital services are complemented by our partners in healthcare at the Atikokan Family Health Team.

Facility Overview	
Facility Name	Atikokan General Hospital
Type of Facility	Healthcare Services
Address	120 Dorothy Street, Atikokan, ON
Gross Area (sq.ft)	75,000

Table 1. Atikokan General 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
<b>Atikokan General Hospital</b>	56	59	51	53	50	55

Table 2. Historic Energy Intensity

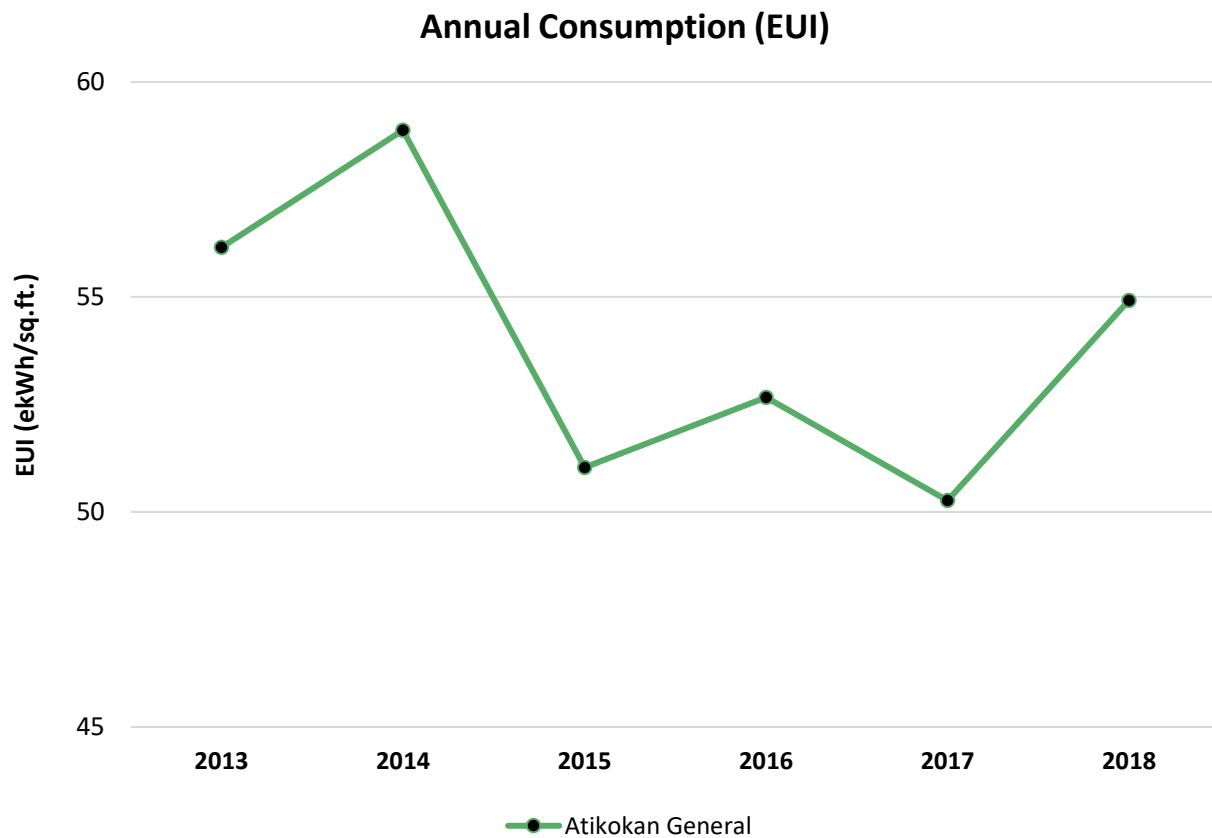


Figure 1. Historic Energy Intensity



## 4 Site Analysis



Picture 2. Atikokan General Hospital

AGH is a fully accredited 41-bed facility with a complement of 100 employees that serve approximately 6,000 outpatients on a yearly basis. We offer emergency, acute care (including cardiac care), complex continuing care, long-term care, and a full range of diagnostic services. A team of rehabilitation therapists provide inpatient, outpatient and home care services.

Facility Information	
Facility Name	Atikokan General Hospital
Address	120 Dorothy Street, Atikokan, ON
Gross Area (sq.ft)	75,000
Average Operational Hours in a Week	168
Number of Beds	41
Number of Floors	1

Table 3. Atikokan General 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)	888,623	891,989	870,215	970,816	988,160	1,013,760
Natural Gas (m <sup>3</sup> )	249,500	265,446	220,712	220,711	269,304	300,634

Table 4. Historic Annual Utility Consumption

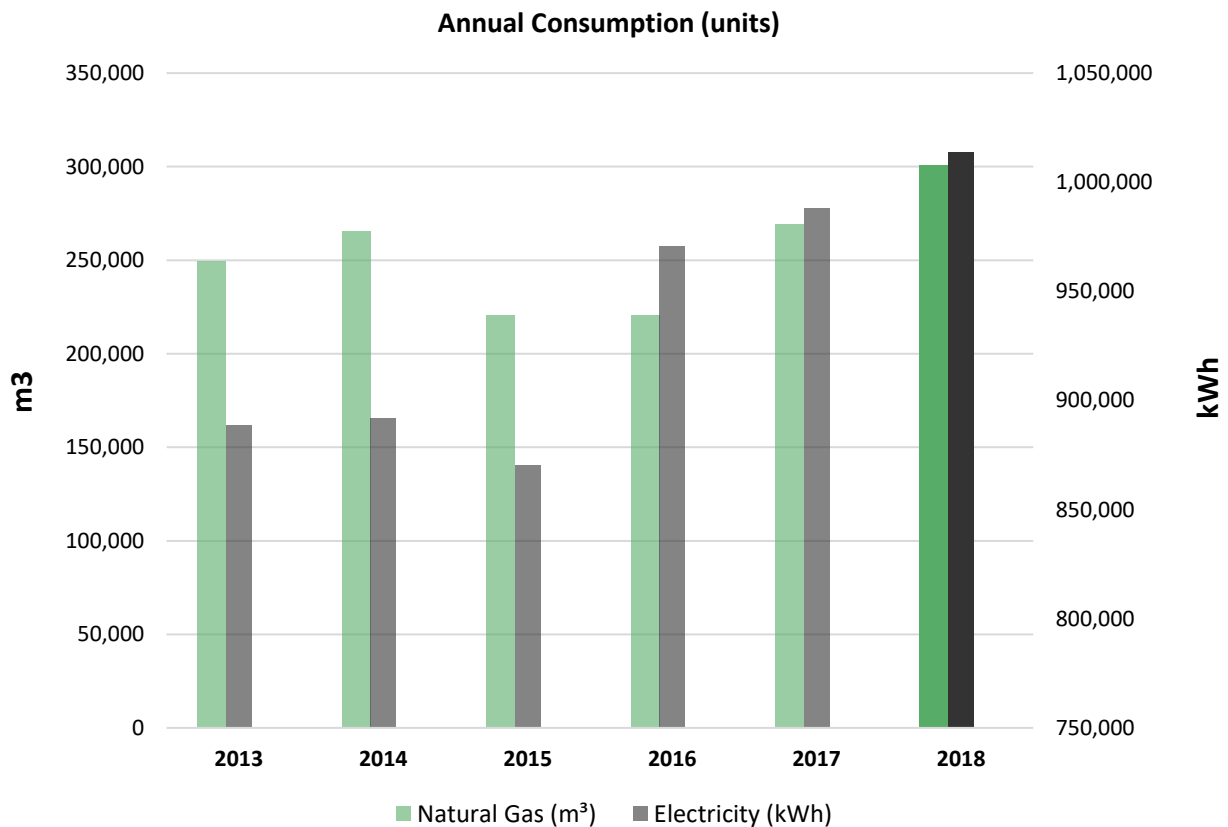


Figure 2. Historic Annual Utility Consumption

## 4.2 GHG Emissions Analysis

Greenhouse gas (GHG) emissions are expressed in terms of equivalent tonnes of Carbon Dioxide (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 3. Examples of Scope 1 and 2

GHG Emissions	2013	2014	2015	2016	2017	2018
Electricity	36	37	36	40	41	42
Natural Gas	472	502	417	417	509	568
<b>Totals</b>	<b>508</b>	<b>538</b>	<b>453</b>	<b>457</b>	<b>549</b>	<b>610</b>

Table 5. Historic Greenhouse Gas Emissions

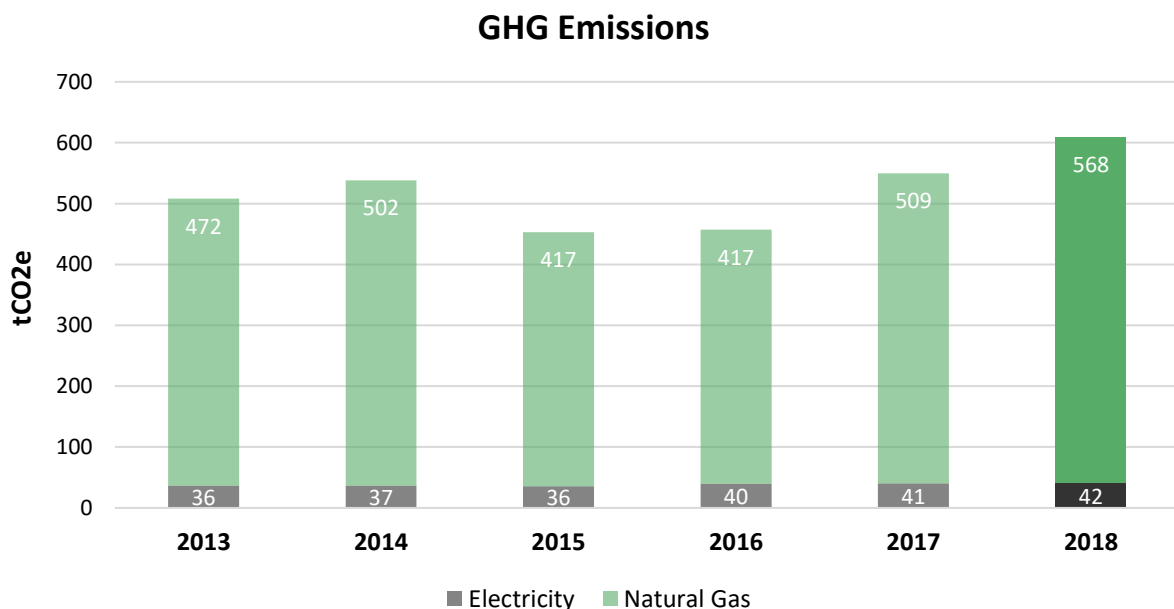


Figure 4. Historic Greenhouse Gas Emissions

### 4.3 Proposed Conservation Measures

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

Measure	Impacted Utility	Estimated Annual Savings		Simple Payback (years)	Year of Implementation
		kWh	m3		
Interior LED Lighting Retrofit	Electricity	10,000	0	7.20	2020
Exterior LED Lighting Retrofit	Electricity	7,000	0	6.43	2020
Chiller Upgrade	Electricity	60,000	0	18.26	2019
VFDs	Electricity	30,000	0	5.61	2022
<b>Totals</b>		<b>107,000</b>	<b>0</b>		

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)	1,013,760	0%	936,760	8%	936,760	8%	906,760	11%	906,760	11%	906,760	11%
Natural Gas (m <sup>3</sup> )	300,634	0%	300,634	0%	300,634	0%	300,634	0%	300,634	0%	300,634	0%

Table 7. Forecast for Annual Utility Consumption

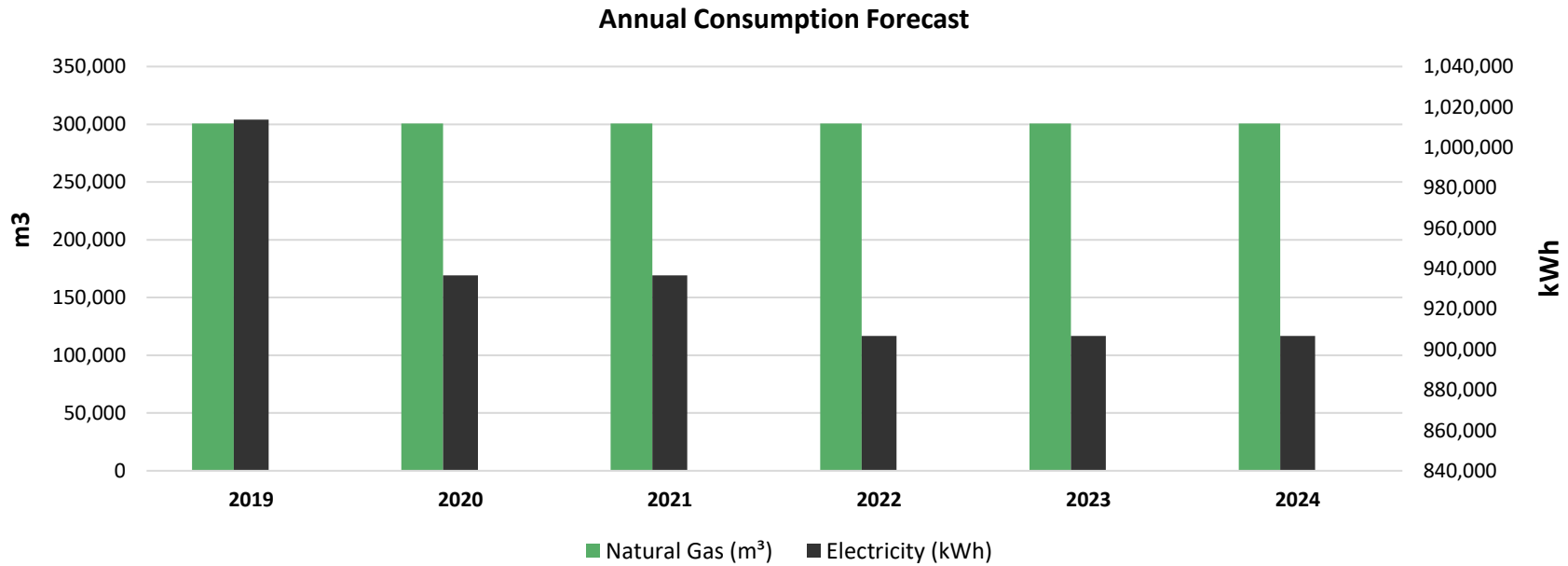


Figure 5. Forecast for Annual Utility Consumption

## 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	42	38	38	37	37	37
Natural Gas	568	568	568	568	568	568
<b>Totals</b>	<b>610</b>	<b>607</b>	<b>607</b>	<b>605</b>	<b>605</b>	<b>605</b>
Reduction from Baseline Year (2018)	0.00%	0.52%	0.52%	0.72%	0.72%	0.72%

Table 8. Forecast for Annual Greenhouse Gas Emissions

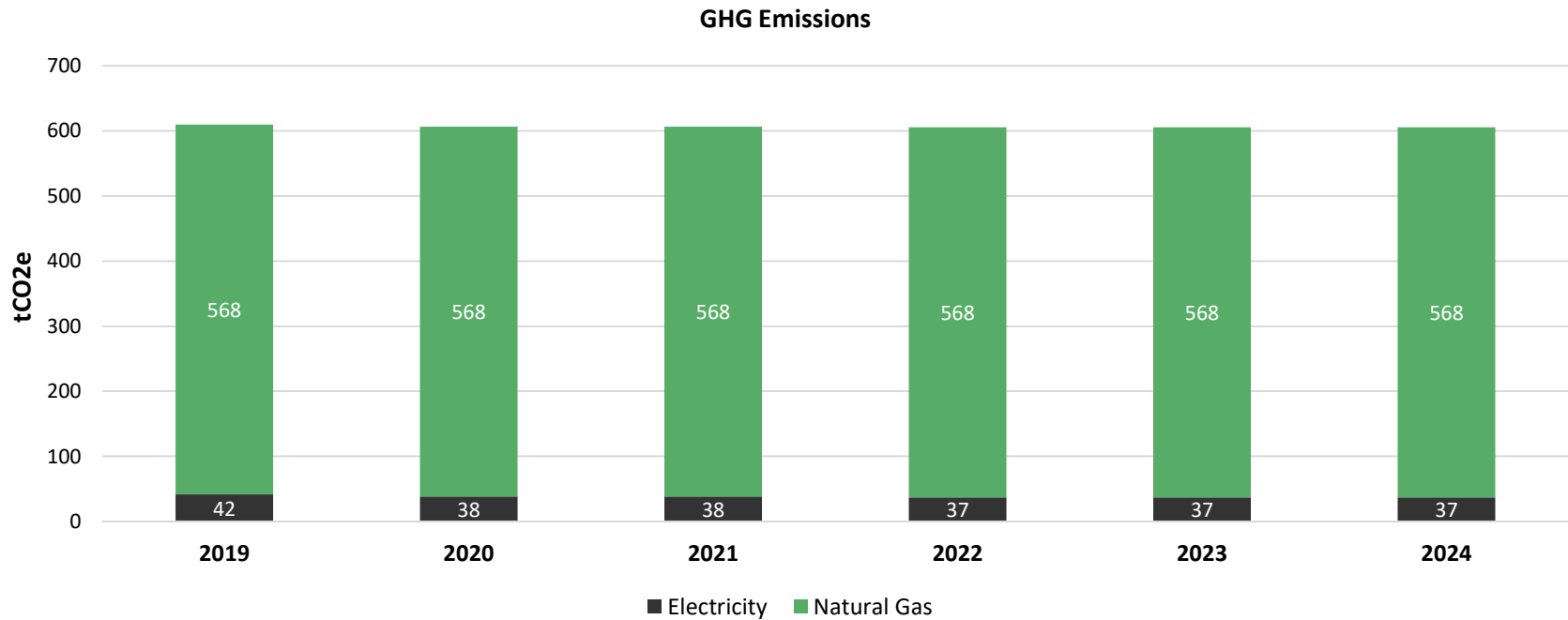


Figure 6. Forecast for Annual Greenhouse Gas Emissions

## 5 Closing Comments

Thank you to all who contributed to Atikokan General 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 Atikokan General Hospital, we approve this Energy Conservation & Demand Management Plan.

This ECDM plan was created through a collaborative effort between Atikokan General 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 <sub>2</sub>	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 <sub>2</sub> e	CO <sub>2</sub> 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 with zero net 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.



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