Energy Conservation & Demand Management Plan 2024

Algoma
PUBLIC HEALTH
Santé publique Algoma

Contents

1. Regulatory Update 3
2. Executive Summary 4
3. About Algoma Public Health 6
4. Site-Wide Historical Site Analysis 8
   - 4.1. Site-Wide Historical Energy Intensity 8
   - 4.2. Historical Utility Consumption Data 9
   - 4.3. Site-Wide Historical GHG Emissions 10
   - 4.4. Proposed Energy Conservation and GHG Reduction Measures 12
5. Algoma Public Health Outlook 13
   - 5.1. Utility Consumption Forecast 13
   - 5.2. Site-Wide GHG Emissions Forecast 14
6. Closing Comments 15
7. Appendix 16
   - 7.1. Glossary 16
   - 7.2. Tables and Figures 17

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 The Bill repealed the GEA and all its underlying Regulations, including O. Reg. 397/11.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

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.

2. Executive Summary

The purpose of this Energy Conservation and Demand Management (ECDM) Plan from Algoma Public Health 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 Algoma Public Health's commitment to efficiency, financial responsibility and environmental stewardship, this ECDM outlines how Algoma Public Health 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.

Through past conservation and demand initiatives, Algoma Public Health has achieved the following results:

- 53,865kwh reduction in electricity use

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 28 ekWh/sq. ft
- Energy-related emissions equaled 297 tCO2e

To obtain full value from energy management activities, Algoma Public Health 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, Algoma Public Health can expect to achieve the following targets by 2029, compared with 2023:

- 50% reduction in electricity consumption
- 53% reduction in natural gas consumption
- 55% reduction in GHG emissions

Algoma Public Health's Energy Performance and Path Forward

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

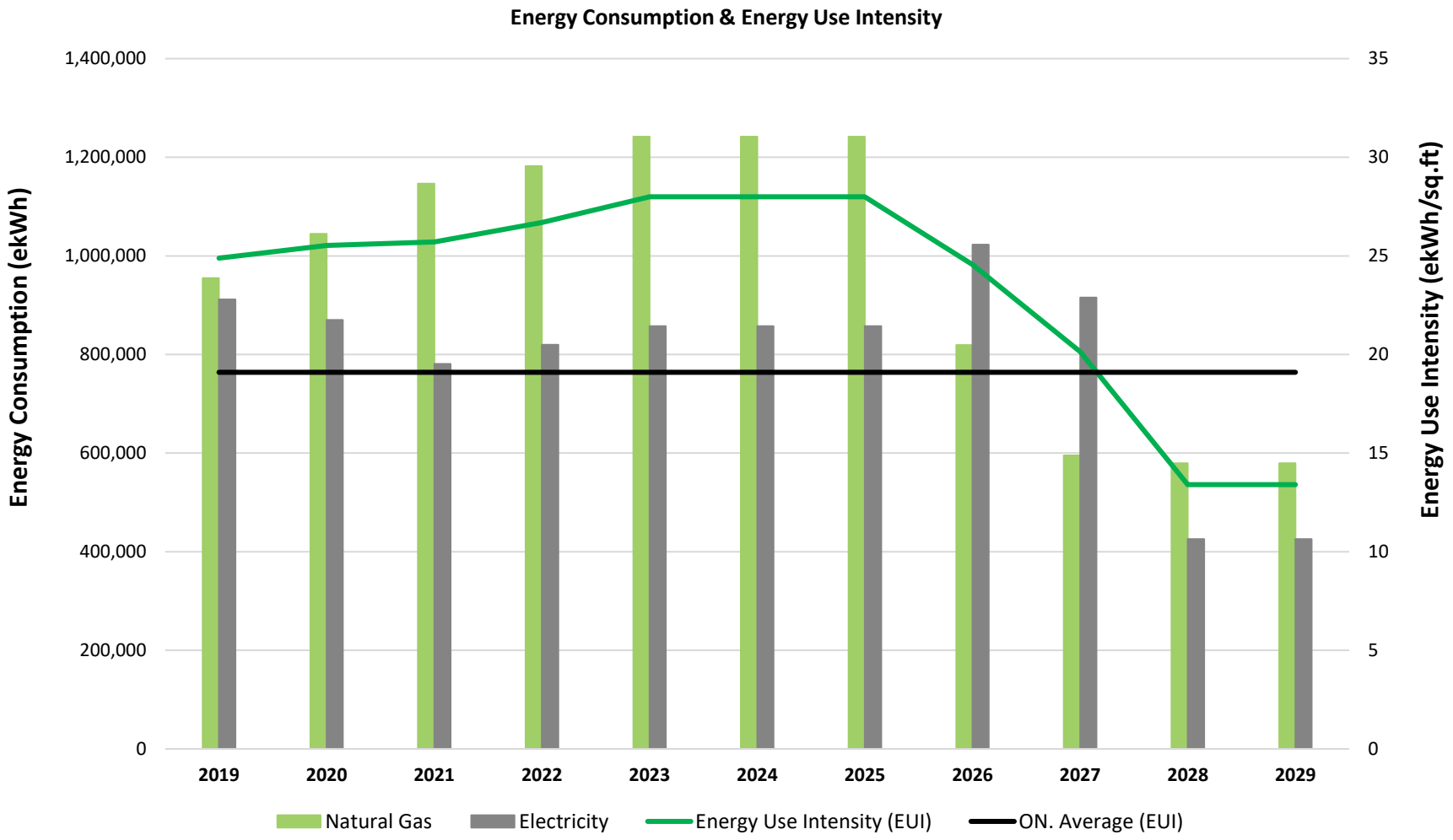

Figure 1. *Energy Consumption Trends & Projections*

3. About Algoma Public Health

Figure 2. *Algoma Public Health*

Algoma Public Health (APH) is a public health agency committed to improving health and reducing social inequities in health through evidence-informed practice. APH has a main office in Sault Ste. Marie and three offices in the Algoma district: Blind River, Elliot Lake and Wawa. APH has 150 employees who deliver provincially legislated public health services and community programs. APH is governed by an autonomous Board of Health and have strong community partnerships throughout the Algoma district.

This ECDM plan pertains to only the main APH in Sault Ste. Marie which is owned and operated by APH - the district offices are leased facilities and not part of the plan.

Algoma Public Health Facility Information	
Facility Name	**Algoma Public Health**
Type of Facility	Public Health Facility
Address	294 Willow Ave, Sault Ste. Marie, ON P6B 0A9
Gross Area (Sq. Ft)	75,000
Average Operational Hours in a Week	35
Number of Floors	3

Table 1*. Algoma Public Health Facility Information*

Our Code of Conduct ensures that we, as members of Algoma Public Health, work in a safe, courteous and friendly environment and that we nurture a culture of integrity and respect. APH is one of 34 non-profit public health agencies funded by local and provincial governments. We work with individuals, families and community partners to promote and protect health and to prevent disease

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

Health for all. Together.

Our Mission

We promote and protect community health and advance health equity in Algoma.

Our Values

- Excellence
- Respect
- Accountability & Transparency
- Collaboration

Figure 3. APH Values Graphic - Strategic Plan

4. Site-Wide Historical Site Analysis

4.1. Site-Wide 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 Medical Offices (derived from Natural Resources Canada's Commercial and Institutional Consumption of Energy Survey), which was found to be 19.10 ekWh/sq. ft.

Year	2019	2020	2021	2022	2023
Algoma Public Health	24.89	25.53	25.70	26.69	28.00

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

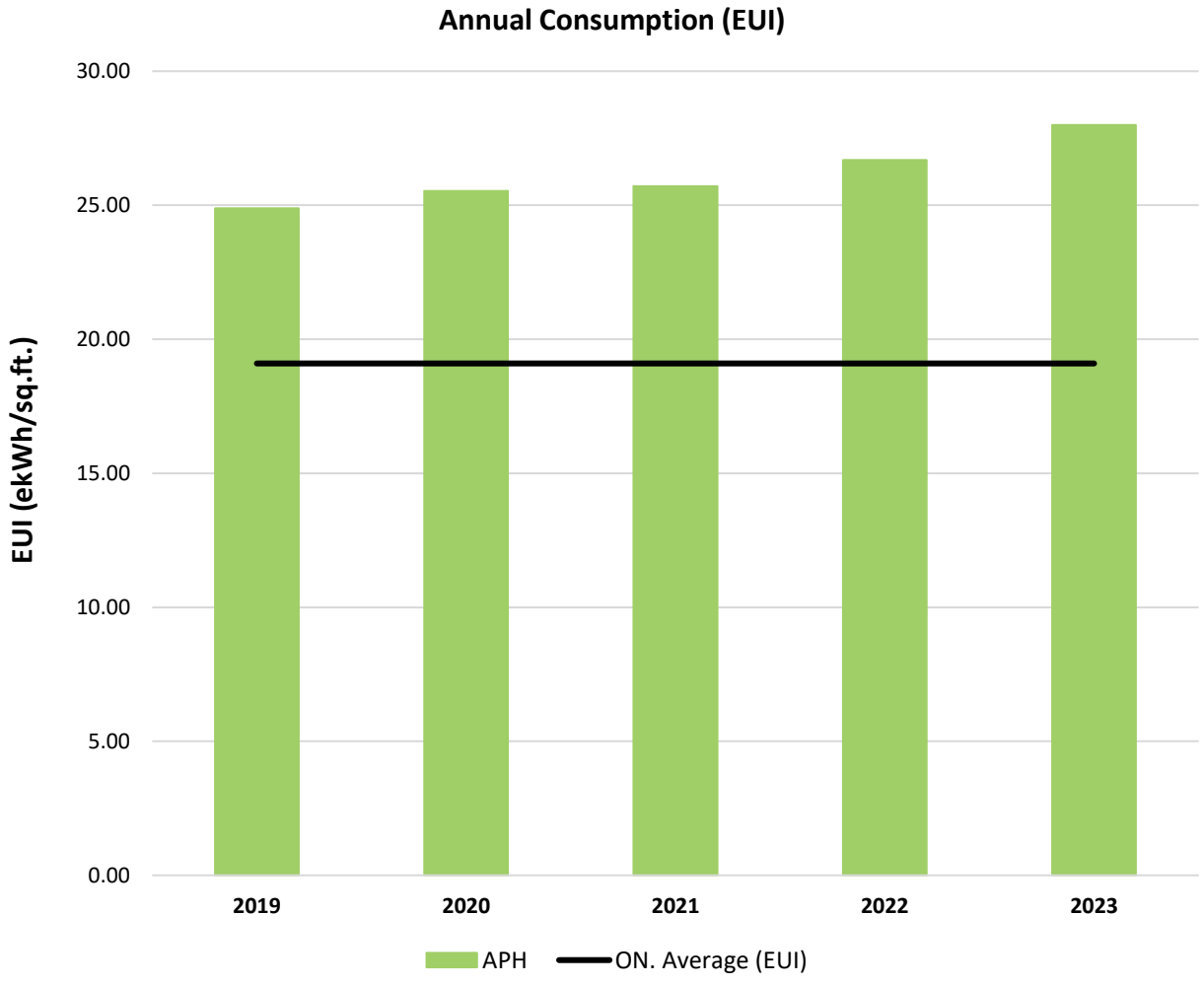

***Figure 4.** Historic Annual Energy Utilization Indices*

4.2. Historical Utility Consumption Data

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)	911,593	869,839	781,096	819,497	857,729
Natural Gas (m^3)	90,422	98,942	108,597	111,935	117,616

Table 3.

Historic Annual Utility Consumption

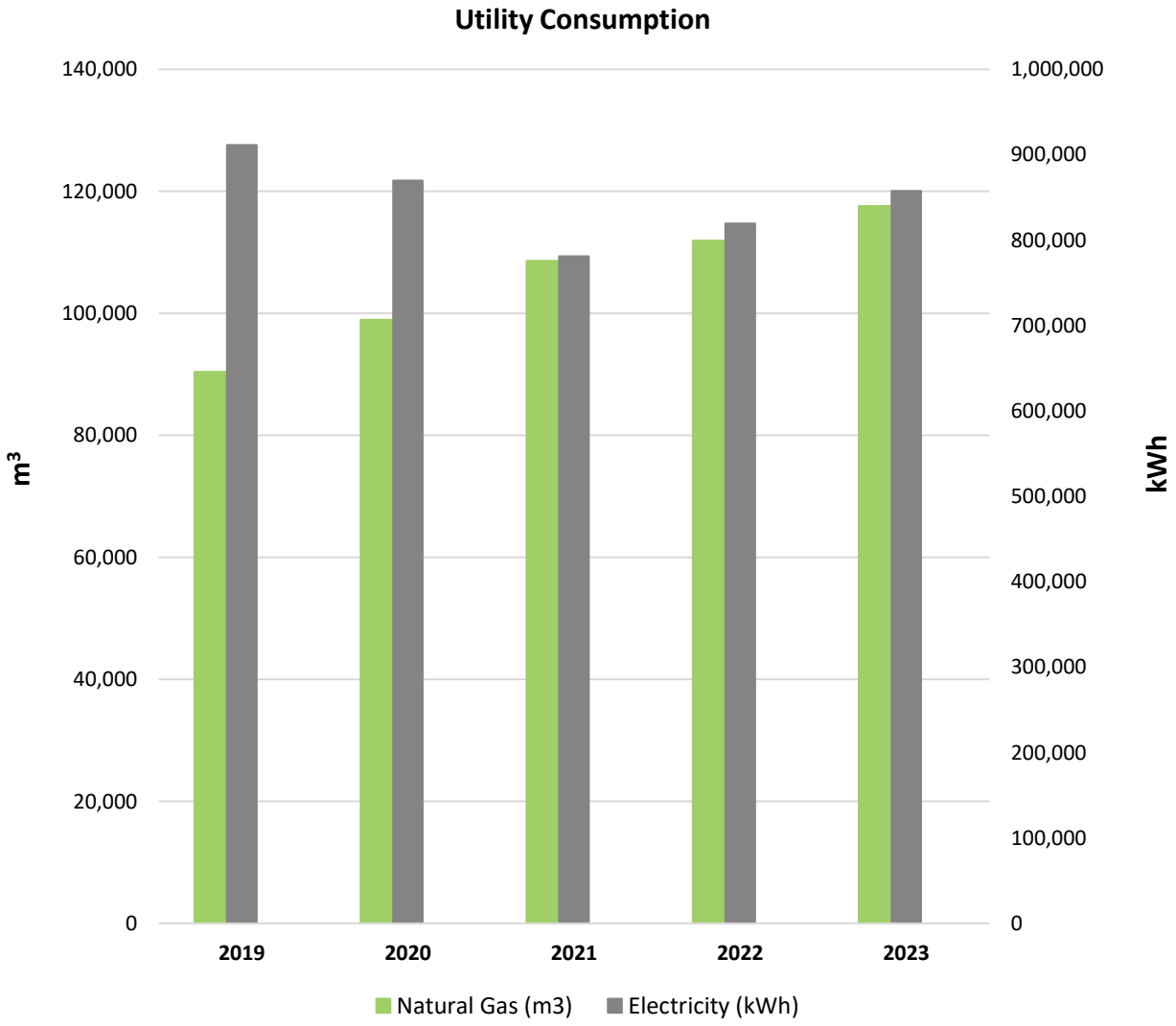

***Figure 5**. Historic Annual utility Consumption*

4.3. Site-Wide 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.

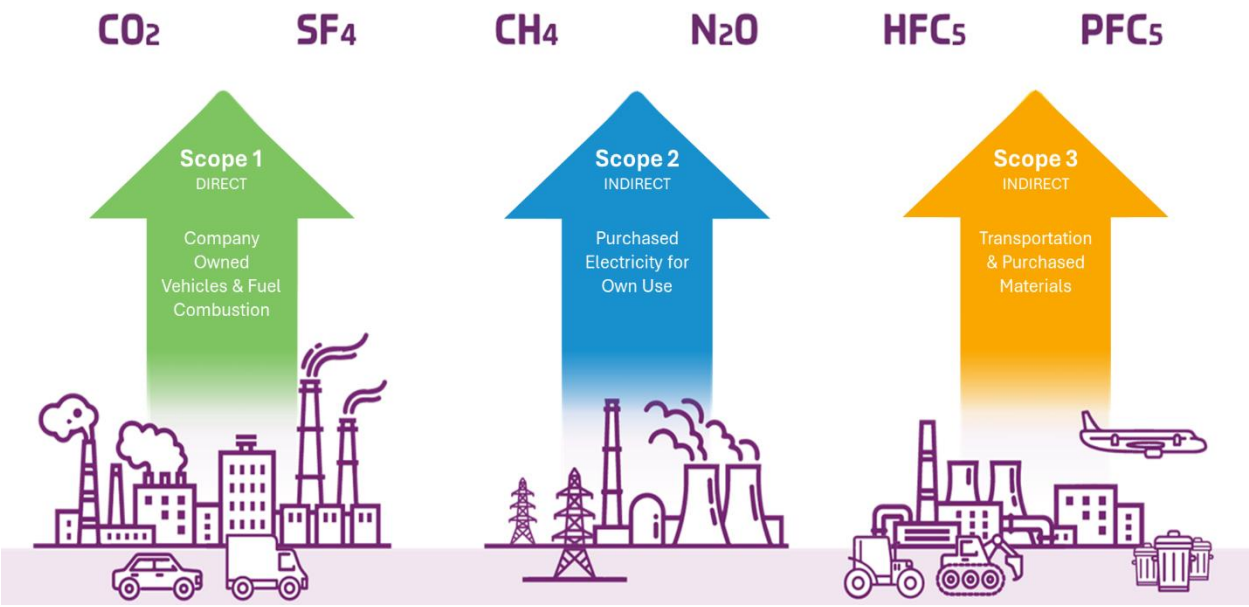

Figure 6. *Examples of Scope 1 and 2*

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

GHG Emissions (tCO2e)	2019	2020	2021	2022	2023
Natural Gas (Scope 1)	174	190	209	215	226
Electricity (Scope 2)	23	22	20	58	71
Total Scope 1 & 2 Emissions	**196**	**213**	**229**	**273**	**297**

Table 4. *Historic Greenhouse Gas Emissions*

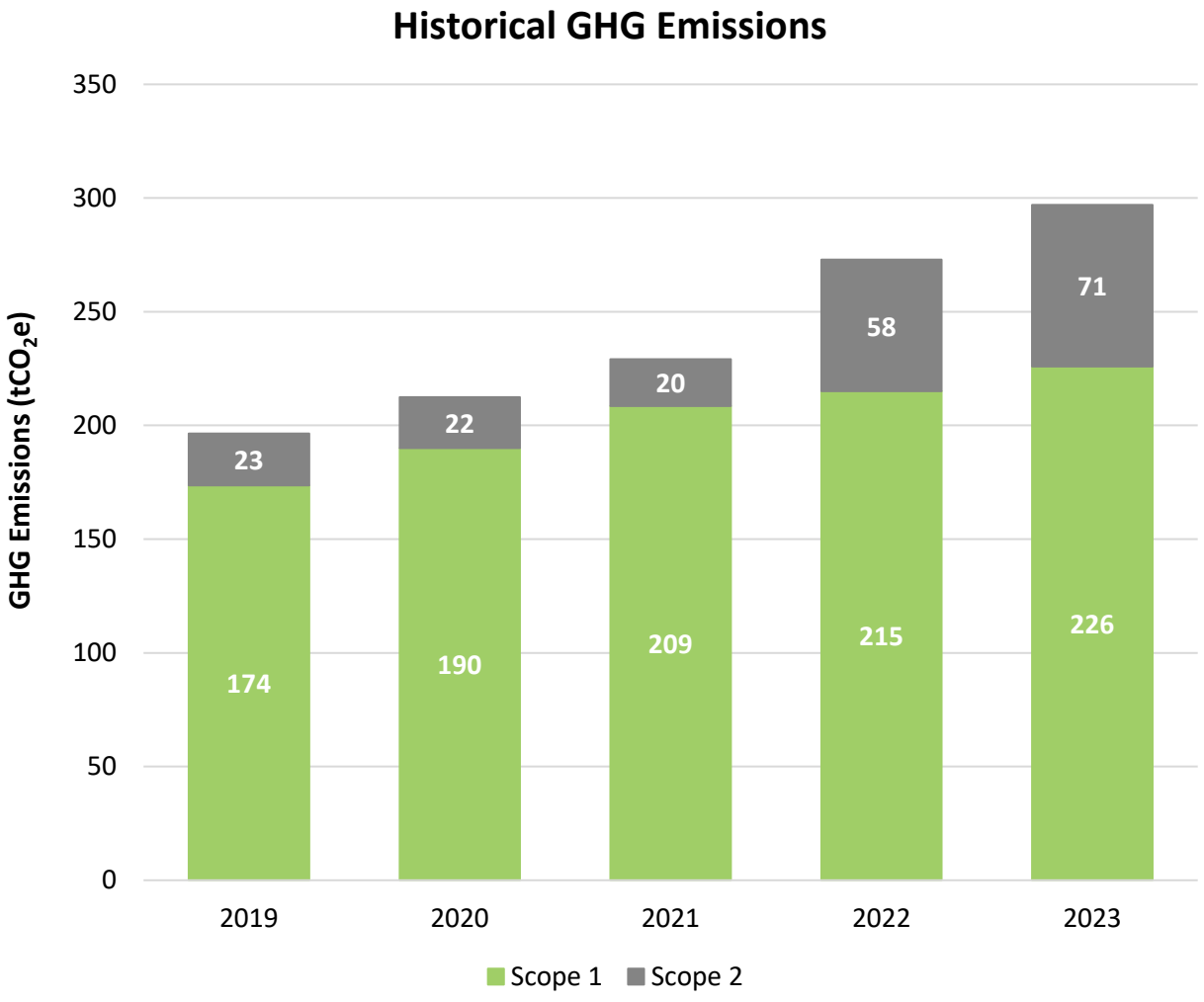

Figure 7. *Historical GHG Emissions*

4.4. 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 table on the following page outlining savings potential of the targeted utilities and estimated project costs. Table 4 also lists a recommended year of implementation for each measure, strategically chosen to maximize Algoma Public Health's energy conservation and GHG reduction benefits.

Measure	Estimated Annual Savings			Project Cost	Simple Payback (Years)
	Electricity (kWh)	Natural Gas (m^3)	Cost ($)		
LED Lighting Upgrade	136,006	-900	18636	$600,000	32.2
Building Automated System Scheduling and Optimization	93,401	14,891	19777	$236,303	11.9
Building Envelope Upgrades (Exterior)	10,594	1,470	2145	$150,356	70.1
Boiler Upgrade and Heat Pump Installation	-301,188	40,955	-23737	$2,360,000	N/A
Power Factor Correction (Utility penalty reduction)	0	0	367	$30,800	83.9
Monitor and Control Plug Loads	15,439	0	2161	$60,750	28.1
Rooftop Solar PV (185 kW)	217,895	0	30505	$407,000	13.3
Carport Solar PV (204 kW)	246,230	0	34472	$1,122,000	32.5
Metering and Monitoring Software	13,815	6,324	4780	$101,250	21.2
Total	**432,192**	**62,739**	**$89,107**	**$5,068,459**	**56.9**

Table 5. *Proposed Measures*

5. Algoma Public Health Outlook

5.1. Utility Consumption Forecast

By implementing the recommended measures stated in the previous section, Algoma Public Health's projected electricity and natural gas use at the Sault Ste. Marie, 294 Willow Avenue site 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 2019.

Utility	2024		2025		2026		2027		2028		2029	
	Units	% Reduction	Units	% Reduction	Units	% Reduction	Units	% Reduction	Units	% Reduction	Units	% Reduction
Natural Gas (m^3)	117,616	0%	117,616	0%	77,561	34%	56,347	52%	54,877	53%	54,877	53%
Electricity (kWh)	857,729	0%	857,729	0%	1,022,911	-19%	915,695	-7%	425,537	50%	425,537	50%

Table 6. Forecast of Annual Utility Consumption from 2019 to 2024

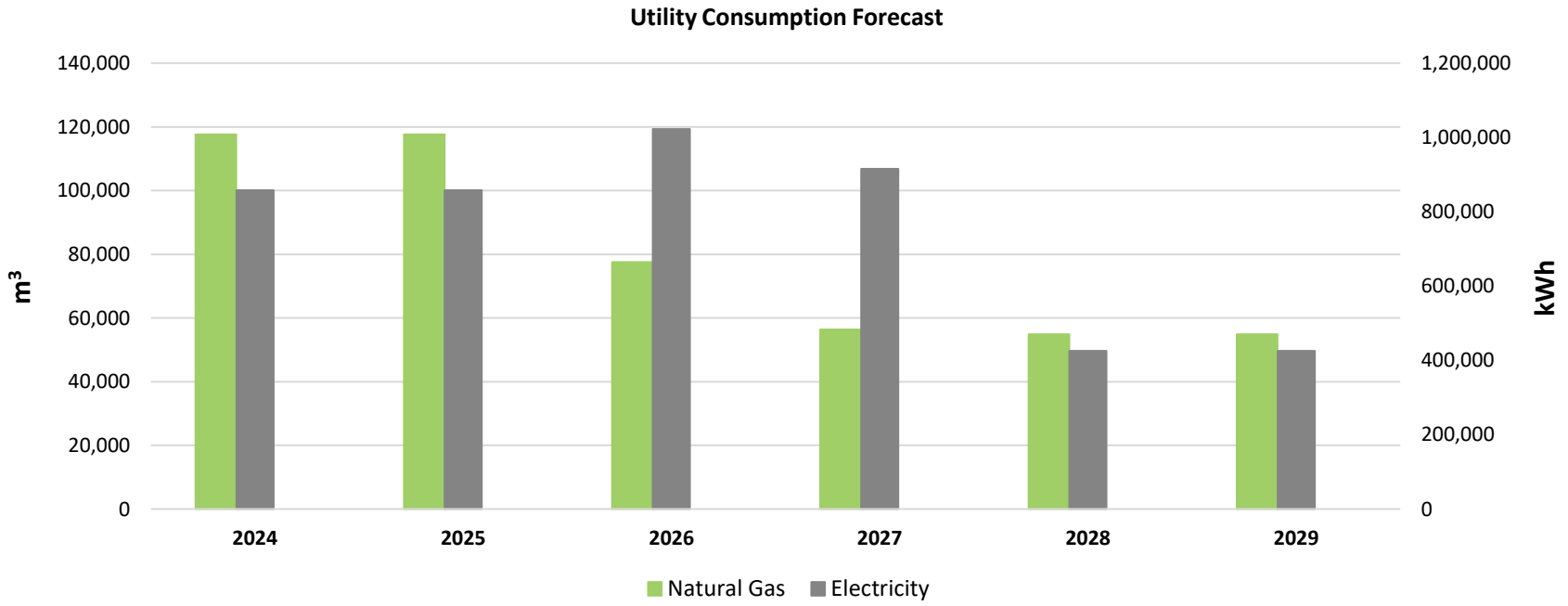

Figure 8. Forecast of Annual Energy Consumption

5.2. Site-Wide GHG Emissions Forecast

The organizational GHG emissions for Algoma Public Health are calculated based on the forecasted Site-wide energy consumption data analyzed in the previous section and are tabulated in the following table. The percent of reduction is based on the baseline year of 2019.

Utility Source (tCO2e)	2024	2025	2026	2027	2028	2029
Natural Gas (scope 1)	226	226	149	108	105	105
Electricity (scope 2)	56	75	78	80	32	29
Totals	**282**	**301**	**227**	**188**	**138**	**135**
Reduction from Baseline Year	**5%**	**-1%**	**23%**	**37%**	**54%**	**55%**

Table 7. *Forecast of Annual Greenhouse Gas Emissions*

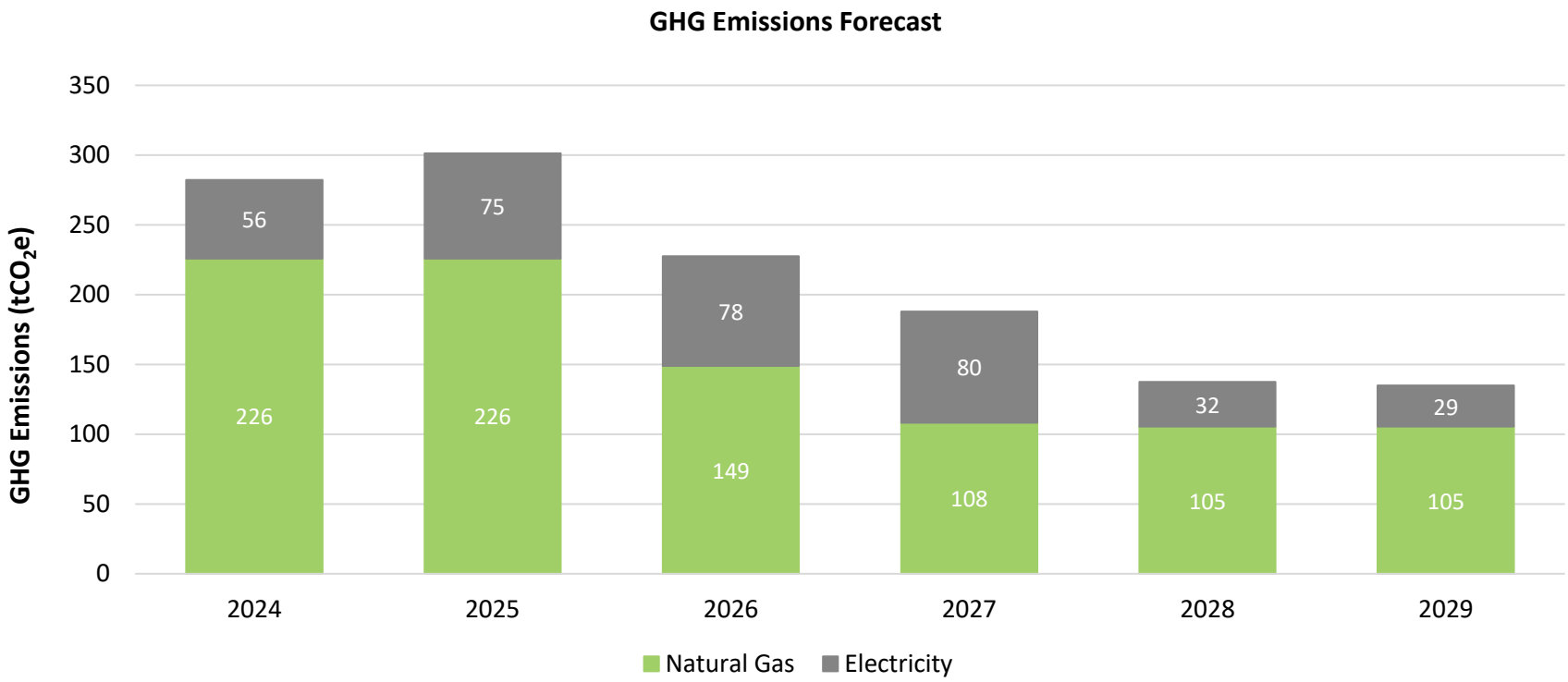

Figure 9. *Forecast of Annual Greenhouse Gas Emissions*

6. Closing Comments

Thank you to all who contributed to Algoma Public Health's Energy Conservation & Demand Management Plan. We consider our facility an integral part of the local community. This plan will help to support efficiencies within our agency while integrating environmental stewardship into all aspects of facility operations.

On behalf of the Senior Leadership Team here at Algoma Public Health, we approve this Energy Conservation & Demand Management Plan.

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Dr. John Tuinema
Acting Medical Officer of Health/CEO

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

7. Appendix

7.1. 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.

7.2. Tables and Figures

Tables

Table 1. Algoma Public Health Facility Information 6
Table 2. Historic Energy Use Intensity 8
Table 3. Historic Annual Utility Consumption 9
Table 4. Historic Greenhouse Gas Emissions 11
Table 5. Proposed Measures 12
Table 6. Forecast of Annual Utility Consumption from 2019 to 2024 13
Table 7. Forecast of Annual Greenhouse Gas Emissions 14

Figures

Figure 1. Energy Consumption Trends & Projections 5
Figure 2. Algoma Public Health 6
F**igure 3**. APH Values Graphic - Strategic Plan 7
Figure 4. Historic Annual Energy Utilization Indices 8
Figure 5. Historic Annual utility Consumption 9
Figure 6. Examples of Scope 1 and 2 10
Figure 7. Historical GHG Emissions 11
Figure 8. Forecast of Annual Energy Consumption 13
Figure 9. Forecast of Annual Greenhouse Gas Emissions 14