



2019



# ENERGY CONSERVATION & DEMAND MANAGEMENT PLAN

## Wilson Memorial General Hospital



NORTH OF SUPERIOR  
HEALTHCARE GROUP

# Executive Summary

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

Through past conservation and demand initiatives, WMGH has achieved the following results:

- 3,140 kwh reduction in electricity use
- 24,686 L reduction in Fuel Oil use

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

- WMGH Energy Use Index (EUI) was 75 ekWh/ft<sup>2</sup>
- Energy-related emissions equaled 664 tCO<sub>2</sub>e

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

- ~ 19% reduction in electricity consumption
- ~ 15% reduction in fuel oil consumption
- 154 tCO<sub>2</sub>e 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.

## *Our Mission*

Our rural hospitals will provide high quality health care services in a learning environment to improve the health of our communities in collaboration with other service providers.

## *Our Vision*

Healthy communities, now, and in the future

## *Our Values*

We are accountable to the communities we serve.

- We will achieve high quality care through the adoption of best practices and innovation.
- We respect the changing and diversifying natures of our communities.
- We value compassion, fairness, integrity and teamwork.

## 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 Wilson Memorial General Hospital



*Picture 1. Wilson Memorial General Hospital*

The North of Superior Healthcare Group is a three-site facility, which includes Wilson Memorial General Hospital, that amalgamated on April 1st, 2016. Since its opening in 1971, Wilson Memorial General Hospital has served the communities of Marathon, Heron Bay, Pic River First Nation and Pic Moberg First Nation with excellent medical care. We are committed to quality of care and experience; great care has been taken to provide efficient service to the public.

Facility overview	
<b>Facility Name</b>	Wilson Memorial General Hospital
<b>Type of Facility</b>	Healthcare Services
<b>Address</b>	26 Peninsula Road, Marathon, ON
<b>Gross Area (ft<sup>2</sup>)</b>	43,971

*Table 1. Wilson Memorial 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
Wilson Memorial General Hospital	81	75	84	63	63	75

Table 2. Historic Energy Intensity

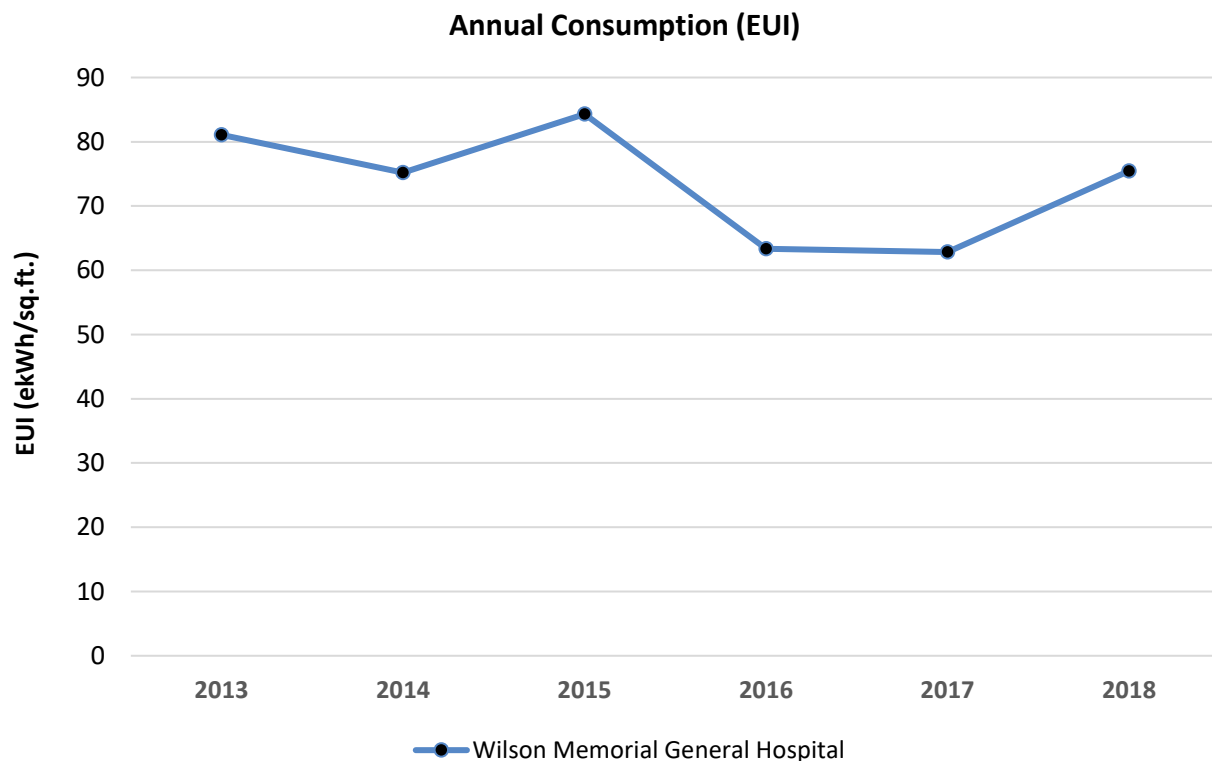


Figure 1. Historic Energy Intensity



## 3.2 Sustainability Strategies to Date

WMGH's regularly reviews opportunities for operational efficiencies and energy saving measures. Below is a list of measures complete to date:

- A roofing replacement was started in 2018 and continued into 2018. The project will increase the insulation value and improve the hospital overall energy consumption.



## 4 Site Analysis



*Picture 2. Wilson Memorial General Hospital*

Wilson Memorial General Hospital delivers health services to Marathon, ON and the surrounding communities of approximately 7500 people. The training, experience and individual skills of the staff enable this hospital to meet the challenges the future brings. We are committed to high quality of care and strive to make our facility first class. Wilson Memorial General Hospital is a recently renovated 21 bed Community Hospital situated on the beautiful shores of Lake Superior.

Facility Information	
<b>Facility Name</b>	Wilson Memorial General Hospital
<b>Address</b>	26 Peninsula Road, Marathon, ON
<b>Gross Area (Ft.<sup>2</sup>)</b>	43,971
<b>Average Operational Hours in a Week</b>	168
<b>Number of Beds</b>	21
<b>Number of Floors</b>	2

*Table 3. Wilson Memorial 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 liter of propane or fuel oil would be converted into the equivalent amount of the energy contained in a kilowatt hour of electricity.

Utilities to the site are electricity, propane, fuel oil and water. 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)	804,577	792,526	808,567	819,240	747,877	801,437
Propane (L)	15,137	16,257	10,934	13,082	17,511	18,195
Fuel Oil (L)	246,951	223,352	262,637	174,469	176,070	222,265

Table 4. Historic Annual Utility Consumption

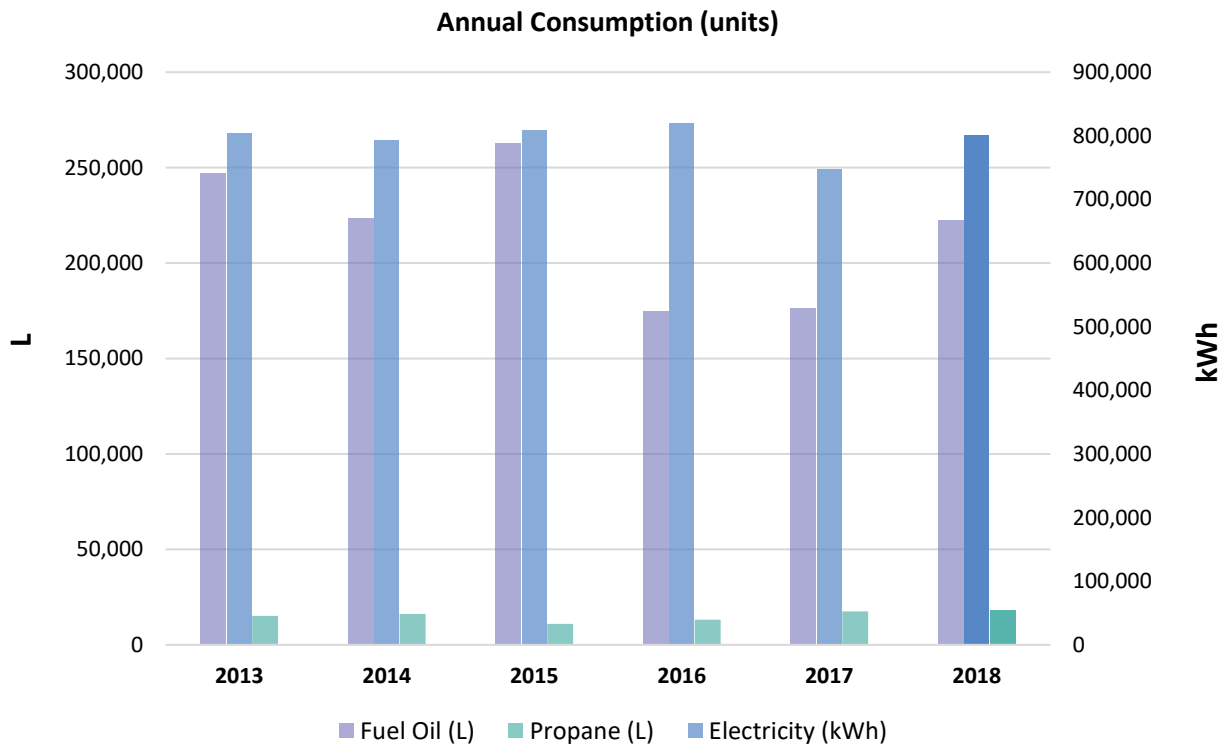


Figure 2. Historic Annual Utility Consumption

## 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, propane, fuel) 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	33	32	33	34	31	33
Propane & Fuel use	694	631	731	494	504	631
<b>Totals</b>	<b>727</b>	<b>664</b>	<b>764</b>	<b>527</b>	<b>535</b>	<b>664</b>

Table 5. Historic Greenhouse Gas Emissions

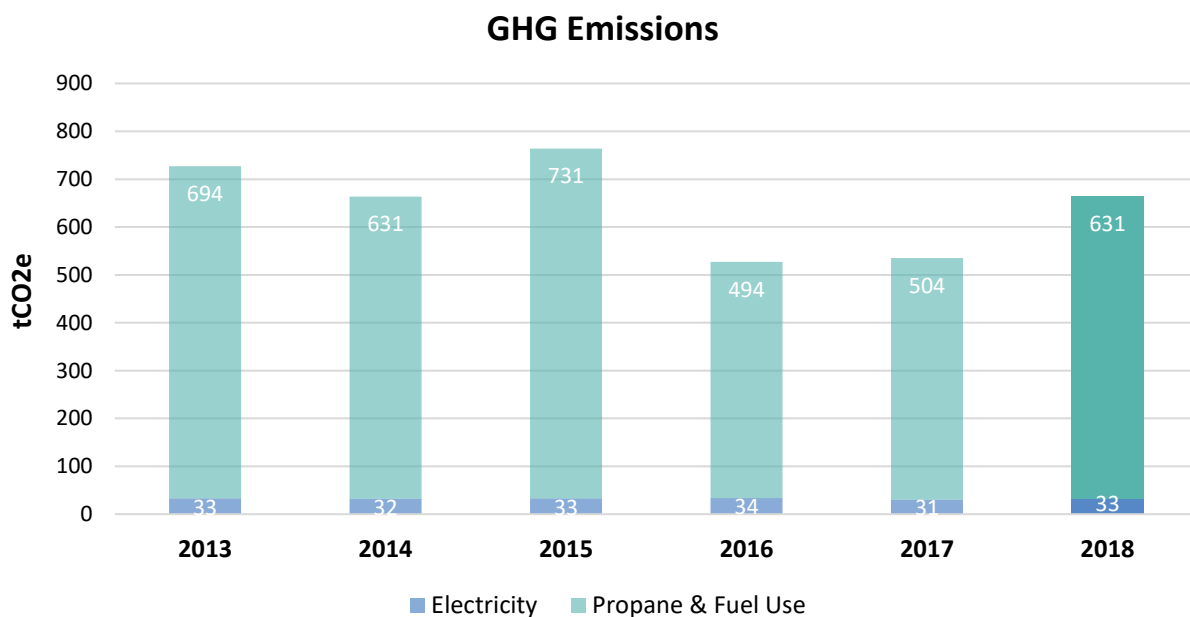


Figure 4. Historic Greenhouse Gas Emissions

### 4.3 Proposed Conservation Measures

Our energy analysis has revealed several conservation strategies for the facility. WMGH’s proposed energy and fuel oil 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)	Year of Implementation
		kWh	L		
<b>Exterior Lighting Retrofit</b>	Electricity	27,043	0	6.66	2020
<b>Interior Lighting Retrofit</b>	Electricity	86,536	0	5.41	2020
<b>Boiler Retrofit</b>	Fuel Oil	0	28,894	4.12	2021
<b>Building Automation System Upgrade</b>	Electricity & Fuel Oil	17,477	4,445	5.64	2023
<b>VSDs on Fans and Pumps</b>	Electricity	25,240	0	7.04	2021
<b>Roofing Upgrade</b>	Electricity & Fuel Oil	3,818	3,986	25.08	2020
<b>Totals</b>		<b>160,114</b>	<b>37,325</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, propane and fuel oil 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)	801,437	0%	684,040	15%	658,800	18%	658,800	18%	641,323	20%	641,323	20%
Propane (L)	18,195	0%	18,195	0%	18,195	0%	18,195	0%	18,195	0%	18,195	0%
Fuel Oil (L)	222,265	0%	222,265	0%	218,691	2%	192,782	13%	192,782	13%	188,797	15%

Table 7. Forecast for Annual Utility Consumption

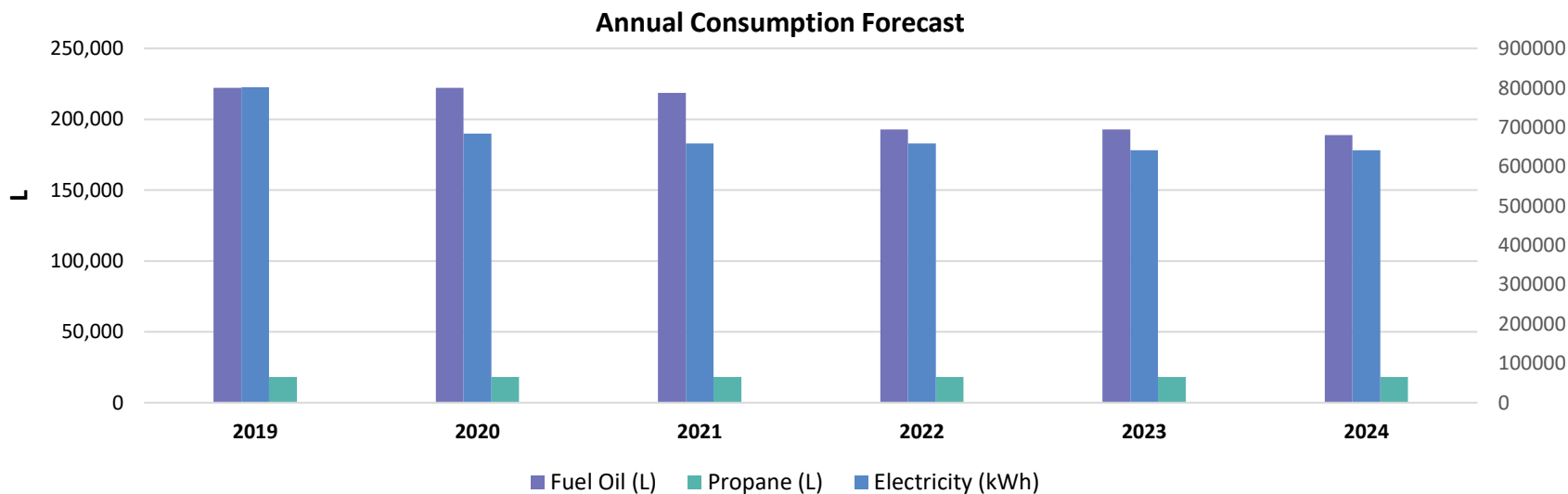


Figure 5. Forecast for Annual Utility Consumption

## 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	33	28	27	27	26	26
Propane & Fuel use	631	631	621	551	551	540
<b>Totals</b>	<b>664</b>	<b>659</b>	<b>648</b>	<b>578</b>	<b>577</b>	<b>566</b>
<b>Reduction from Baseline (2018)</b>	0.00%	0.72%	2.35%	12.97%	13.08%	14.72%

Table 8. Forecast for Annual Greenhouse Gas Emissions

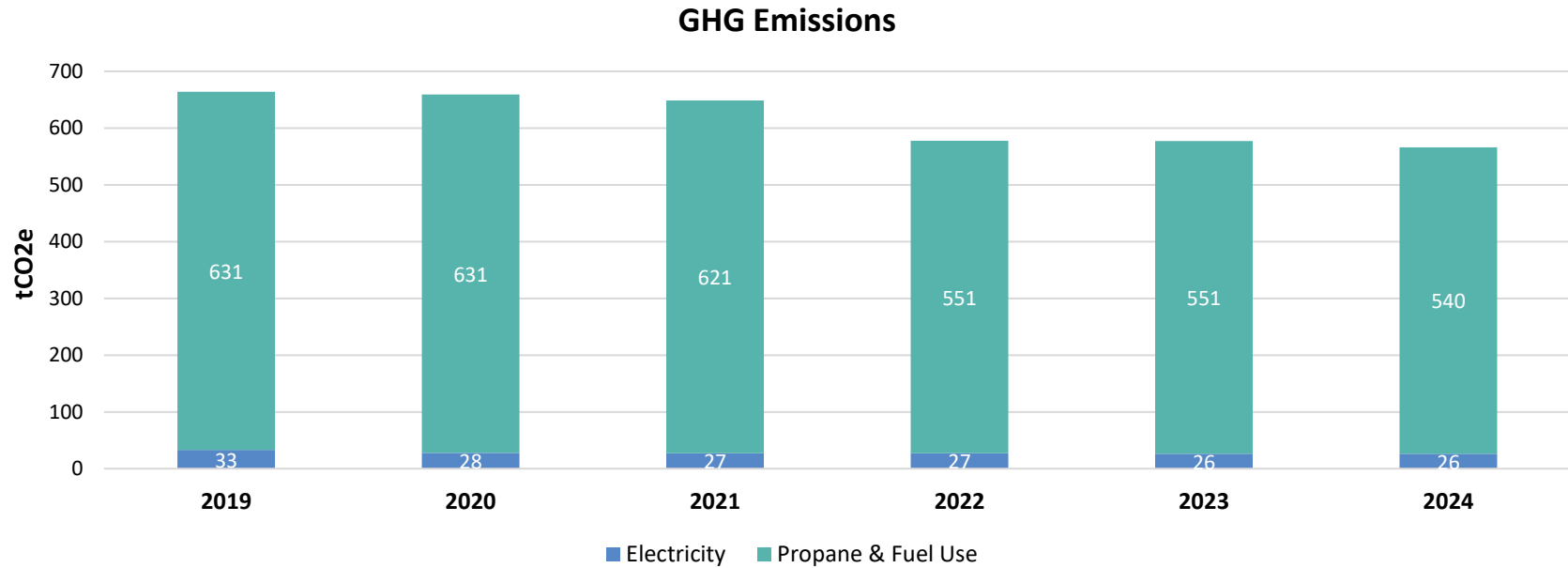


Figure 6. Forecast for Annual Greenhouse Gas Emissions



## 5 Closing Comments

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

This ECDM plan was created through a collaborative effort between Wilson Memorial 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	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 <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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