ENERGY CONSERVATION & DEMAND MANAGEMENT PLAN 2019

HÔTEL-DIEU GRACE HEALTHCARE

ESTD 1888

Executive Summary

The purpose of this Energy Conservation and Demand Management (ECDM) Plan from Hôtel Dieu Grace Healthcare ("HDGH") 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 HDGH'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, HDGH has achieved the following results:

- 399,462 kwh reduction in electricity use
- 357,941 m3 reduction in natural gas use
- >13% 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 40 ekWh/ft^2
- Energy-related emissions equaled 3,732 tCO_2e

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

- ~ 15% reduction in electricity consumption
- ~ 7% reduction in natural gas consumption
- 375 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.

At Hôtel-Dieu Grace we strive for service excellence in hospital operations and patient services through the implementation of best practices. We manage the affairs and resources of Hôtel-Dieu Grace Healthcare ethically, creatively and with accountability to achieve outstanding operational and financial performance

Our Mission

To serve the healthcare needs of our community including those who are vulnerable and/or marginalized in any way be it, physically, socially, or mentally. As a catholic sponsored healthcare organization, we provide patient-centered care treating the body, mind, and spirit. We do this by providing holistic, compassionate and innovative care to those we serve.

Our Vision

A trusted leader transforming healthcare and cultivating a healthier community.

Our Values

Respect, teamwork, compassion, and social responsibility.

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 Hôtel-Dieu Grace Healthcare

Picture 1. *Hôtel-Dieu Grace Healthcare*

At Hôtel-Dieu Grace Healthcare, we are committed to improving the health and wellbeing of the community through the delivery of patient-centred, valued based care. We offer a unique blend of services including but not limited to community and home-based services. In collaboration with our healthcare and inter-sectorial partners, Hôtel-Dieu Grace Healthcare is providing care in new ways and in new locations throughout the region to address barriers, improve access and patient outcomes and improve the overall patient experience.

Facility Overview	
Facility Name	Hôtel-Dieu Grace Healthcare
Type of Facility	Healthcare Services
Address	1453 Prince Road, Windsor, ON
Gross Area (ft2)	701,930

Table 1. *Hôtel-Dieu Grace Healthcare 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**
Hôtel-Dieu Grace Healthcare	46	46	41	39	40	40

Table 2. *Historic Energy Intensity*

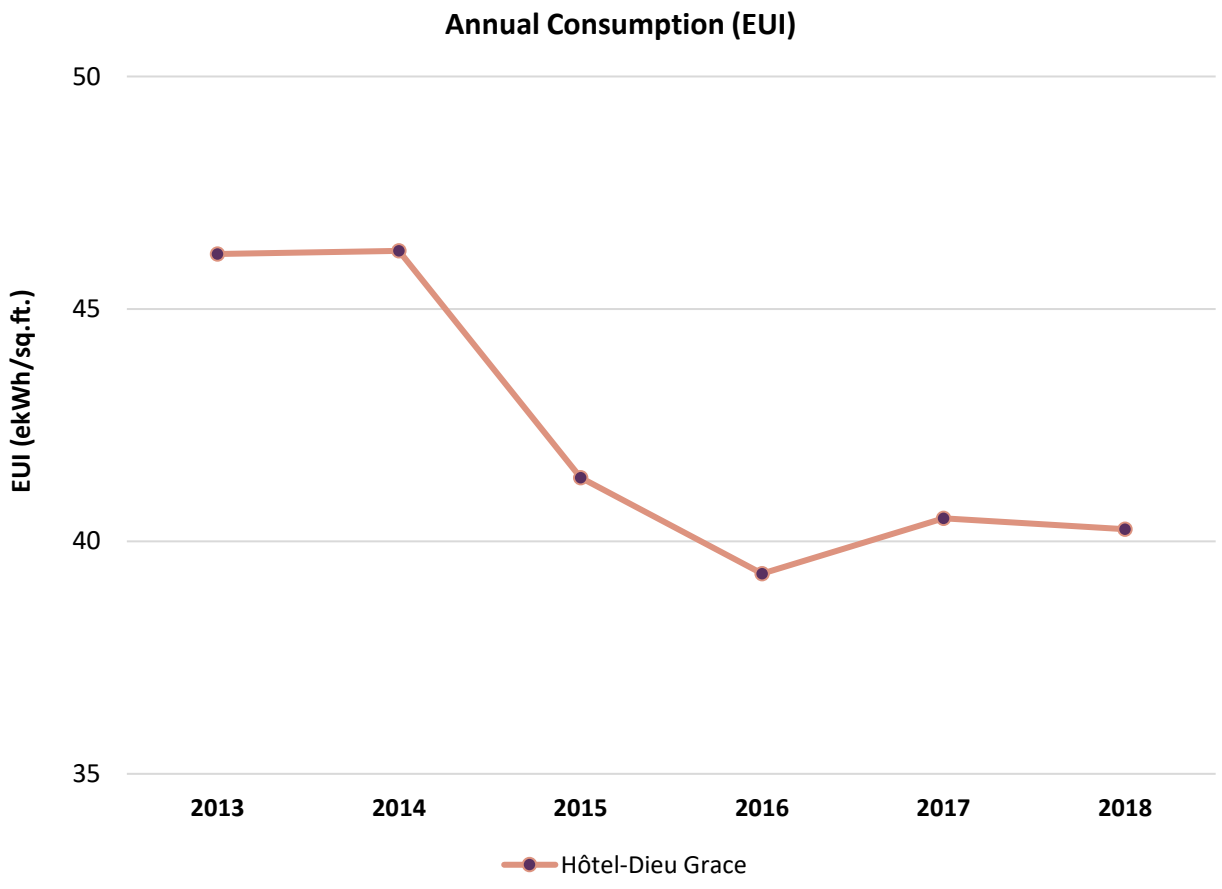

Figure 1*. Historic Energy Intensity*

3.2 Sustainability Strategies to Date

HDGH's current energy saving initiatives are summarized in the table below:

Measure Name	Impacted Utility
LED Lighting Replacement – Although the hospital is planning to complete a lighting retrofit throughout the facility in the upcoming years, they have started replacing certain fixtures with LED's as existing fixtures reached end of life.	Electricity
Ongoing Commissioning & opportunity Review- The hospital is reviewing the opportunity of a performance contract which would have a significant impact on reducing utility consumption and GHG emissions.	Electricity & Natural Gas

Table 3. *Current Sustainability Strategies*

4 Site Analysis

Picture 2. *Hôtel-Dieu Grace Healthcare*

Hôtel-Dieu Grace Healthcare provides services to the Windsor-Essex community. We are a unique community hospital offering services in Mental Health & Addictions; Rehabilitative Care; Complex Medical and Palliative Care; and Children and Youth Mental Health.

Facility Information	
Facility Name	Hôtel-Dieu Grace Healthcare
Facility Type	Healthcare Services
Address	1453 Prince Road, Windsor, ON
Gross Area (Ft.^{2})	701,930
Average Operational Hours in a Week	168
Number of Beds	313
Number of Floors	4

Table 4. *Hôtel-Dieu Grace Healthcare 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)	10,535,145	9,805,870	9,978,937	9,925,391	10,130,945	10,135,683
Natural Gas (m^3)	2,112,804	2,186,287	1,837,923	1,710,070	1,771,079	1,754,863

Table 5. *Historic Annual Utility Consumption*

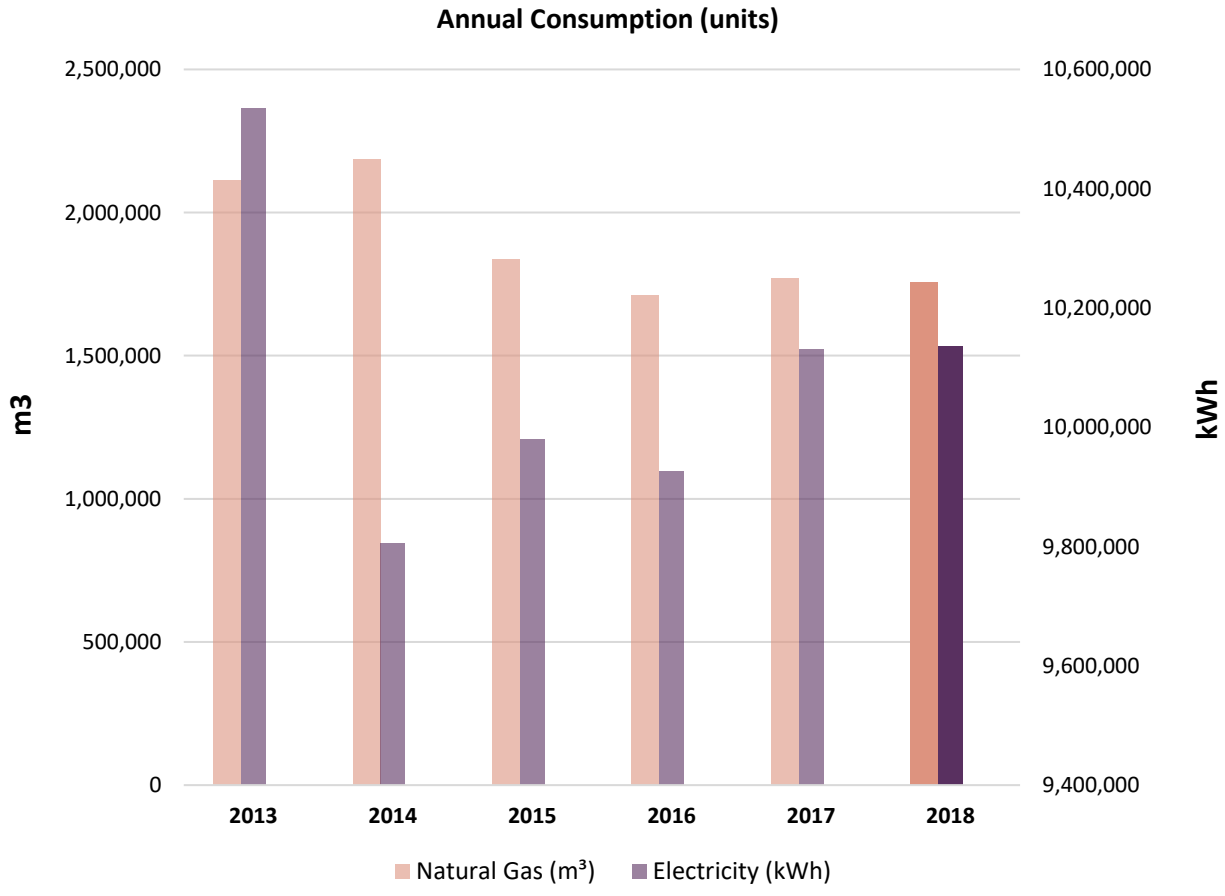

Figure 2. *Historic Annual Utility Consumption*

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.

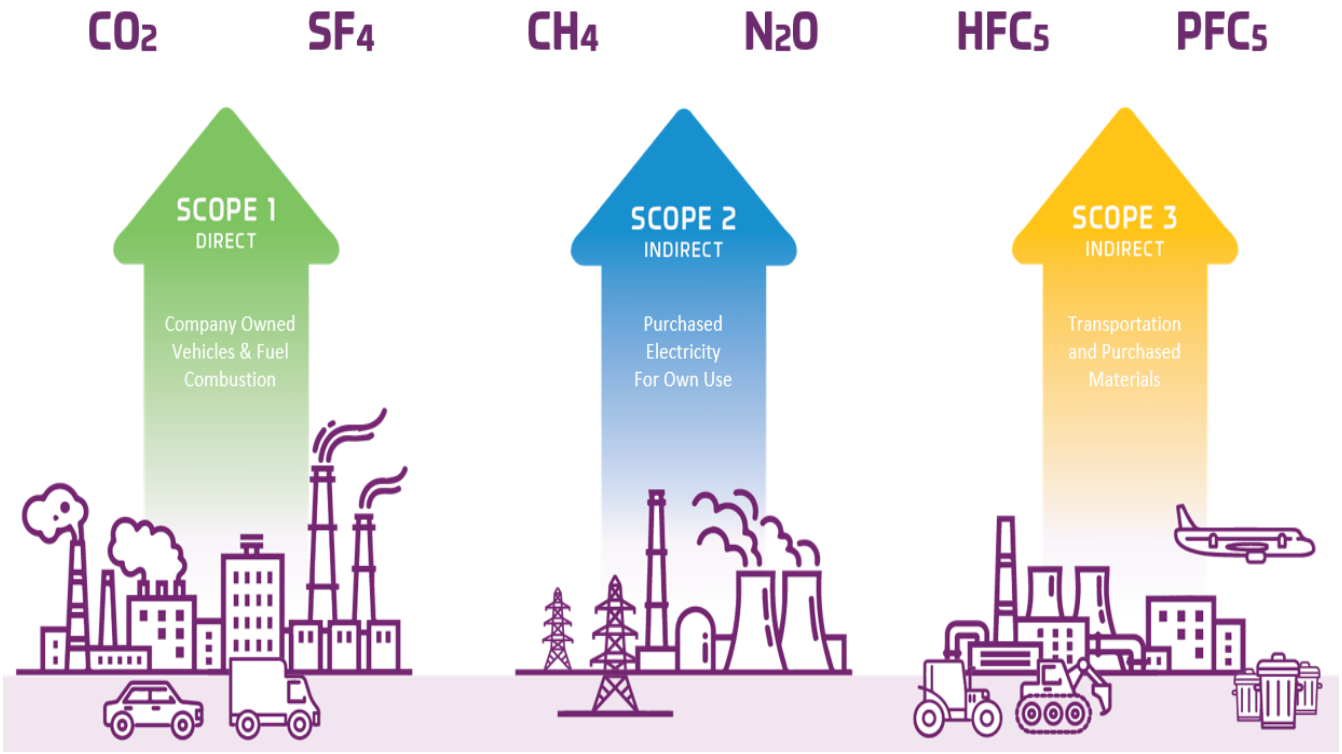

Figure 3. *Examples of Scope 1 and 2*

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

GHG Emissions	2013	2014	2015	2016	2017	2018
Electricity (scope 2)	432	402	409	407	415	416
Natural Gas (scope 1)	3,993	4,132	3,474	3,232	3,347	3,317
Totals	**4,425**	**4,534**	**3,883**	**3,639**	**3,763**	**3,732**

Table 6. *Historic Greenhouse Gas Emissions*

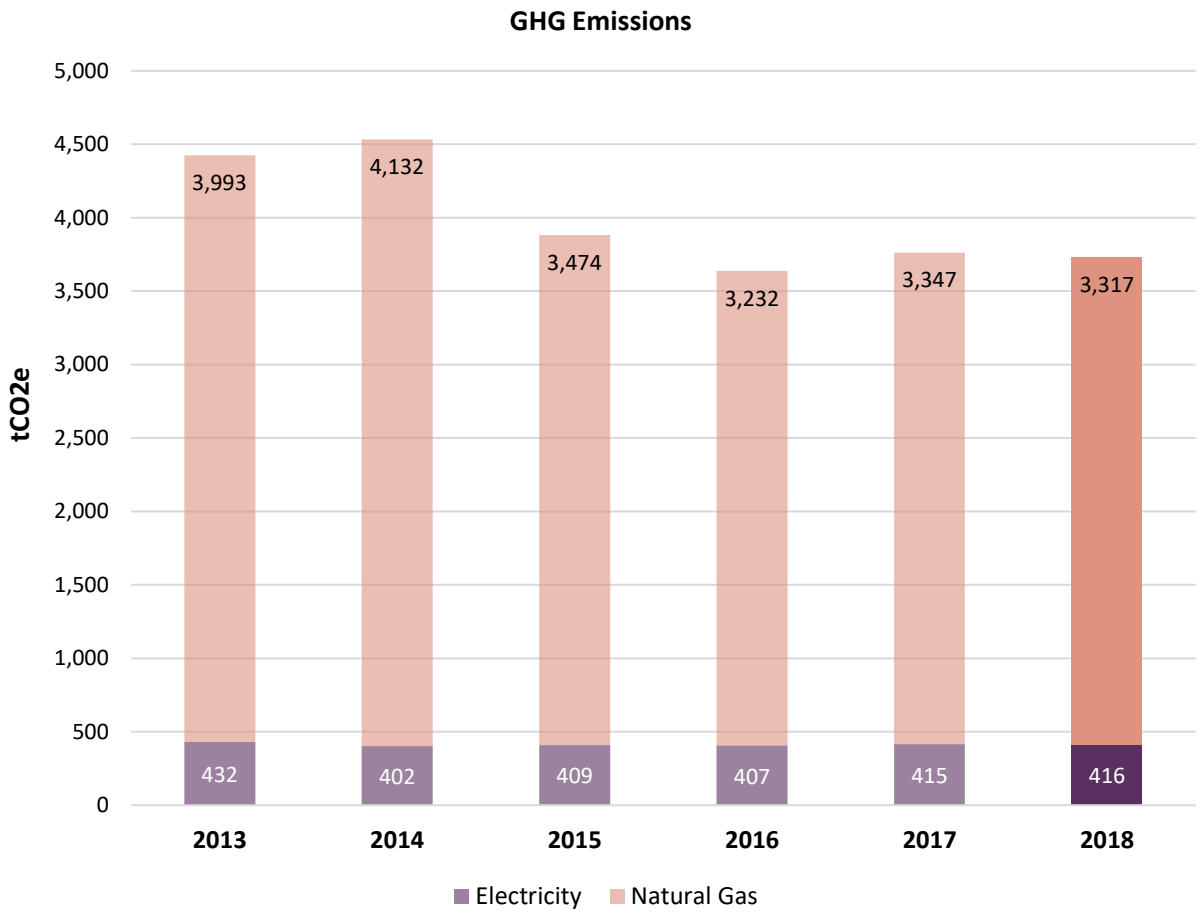

Figure 4. *Historic Greenhouse Gas Emissions*

4.3 Proposed Conservation Measures

Our energy analysis has revealed several conservation strategies for the facility. HDGH'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		Year of Implementation
		kWh	m3	
Indoor Lighting Upgrade	Electricity	958,830	0	2022
Outdoor Lighting Upgrade	Electricity	132,032	0	2023
Install Kitchen Variable Exhaust System	Electricity & Natural Gas	176,811	50,667	2024
Insulate Heating Plant Equipment	Natural Gas	0	4,496	2024
Replace Steam Traps	Natural Gas	0	75,458	2021
Upgrade Chiller	Electricity	321,893	0	2021
Replace Windows	Electricity & Natural Gas	6,590	2,674	2022
Building Envelope Upgrade	Natural Gas	0	28,494	2022
Implement Computer Sleep Settings	Electricity	89,477	0	2022
Solar Photovoltaic Installation for Signage	Electricity	8,199	0	2022
Totals		**1,693,832**	**161,789**	

Table 7. *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)	10,135,683	0%	10,135,683	0%	9,813,790	3%	8,750,694	14%	8,618,661	15%	8,441,850	17%
Natural Gas (m^3)	1,754,863	0%	1,754,863	0%	1,679,405	4%	1,648,237	6%	1,648,237	6%	1,593,074	9%

Table 8. Forecast for Annual Utility Consumption

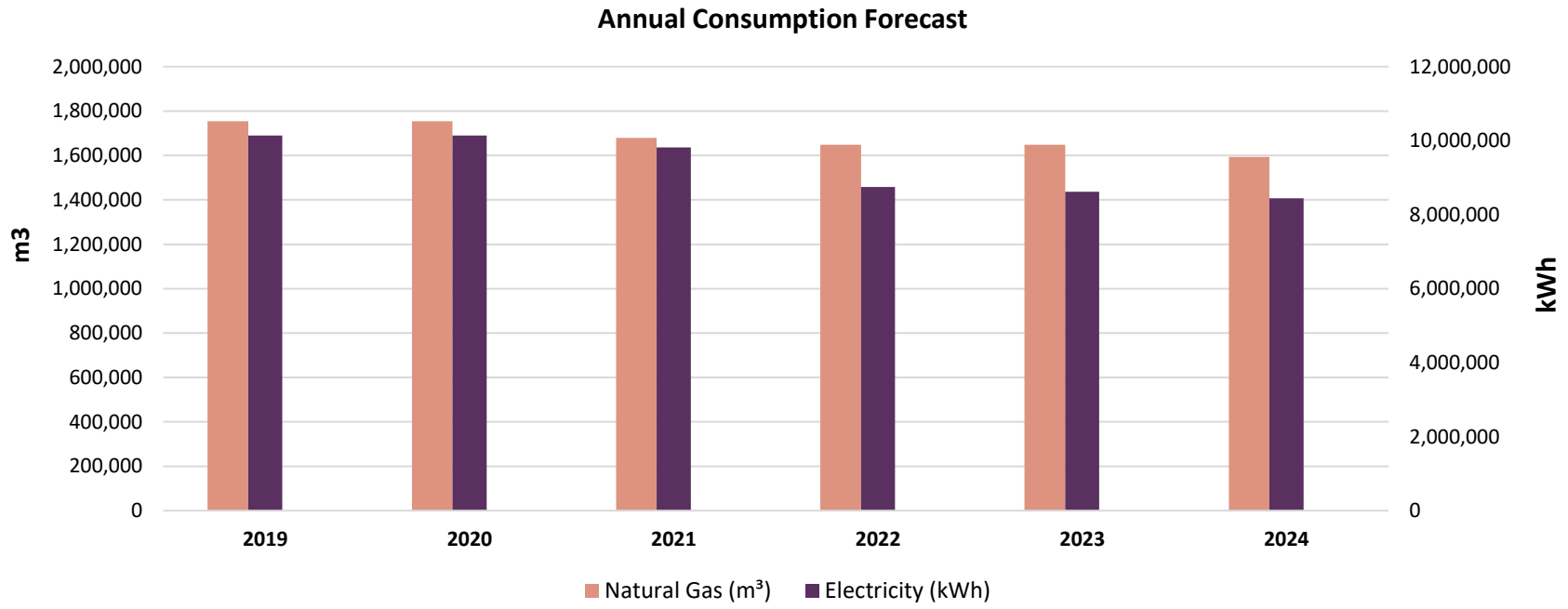

Figure 5. Forecast for Annual Utility Consumption

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 (scope 2)	416	416	402	359	353	346
Natural Gas (scope 1)	3,317	3,317	3,174	3,115	3,115	3,011
Totals	**3,732**	**3,732**	**3,576**	**3,474**	**3,469**	**3,357**
Reduction from Baseline Year (2018)	**0.00%**	**0.00%**	**4.17%**	**6.92%**	**7.07%**	**10.05%**

Table 9. Forecast for Annual Greenhouse Gas Emissions

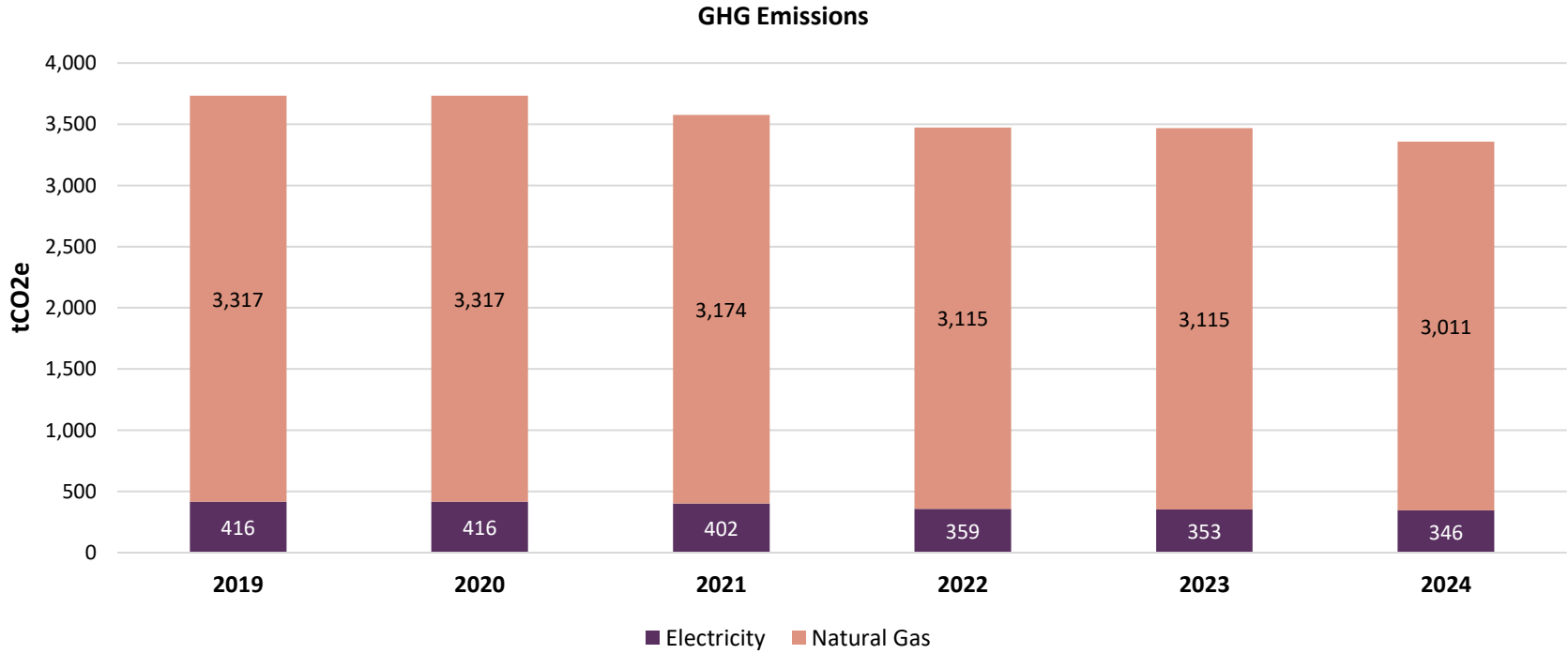

Figure 6. Forecast for Annual Greenhouse Gas Emissions

5 Closing Comments

Thank you to all who contributed to Hôtel-Dieu Grace Healthcare'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 Hôtel-Dieu Grace Healthcare, we approve this Energy Conservation & Demand Management Plan.

This ECDM plan was created through a collaborative effort between Hôtel-Dieu Grace Healthcare 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 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.

6.2 List of Figures, Tables and Pictures

Tables

Figures

Pictures