Energy Conservation & Demand Management Plan 2024-2029

Erie Shores HealthCare
Care Happens Here

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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 The Bill repealed the GEA and all its underlying Regulations, including O. Reg. 397/11.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 overall purpose of this Energy Conservation and Demand Management (ECDM) Plan from Erie Shores HealthCare (ESHC) 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 Erie Shores HealthCare's commitment of efficiency, environmental stewardship and financial responsibility, this ECDM outlines how Erie Shores HealthCare will work to reduce our overall energy consumption, operating costs and greenhouse gas emissions. By implementing the measures outlined in this document, ESHC will ultimately reduce our operating costs and be able to provide quality services to a greater number of people in the community. This ECDM Plan is written in accordance with O. Reg. 25/23 of the recently amended Electricity Act, 1998.

Today, utility and energy related costs are a significant part of overall operating costs. In 2023:

- Energy Use Intensity (EUI) Index was 45 ekWh/sq. ft
- Energy-related emissions equaled 1,024 tCO_2e

Erie Shores HealthCare has seen exponential growth over the last few years which is reflected in the increase in energy usage. We have had an increase in inpatient beds, Emergency and Diagnostic Imaging volumes and we are currently renovating for the addition of a new MRI unit. Now more than ever it will be critical for Erie Shores HealthCare to continue to monitor every opportunity to create energy savings. As we continue to grow it will be vital to review energy usage and ensure we are a stewards of energy efficiency.

To obtain full value from our energy management activities, Erie Shores HealthCare will take a strategic approach to fully integrate energy management into its business decision-making, policies, strategic plan 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 the recommended initiatives provided in this report from 2024-2029, Erie Shores HealthCare can expect to achieve the following targets by 2029, as compared to 2023.

- 20% reduction in natural gas consumption
- 12% reduction in electricity consumption
- 21% reduction of GHG emissions

Erie Shores HealthCare's Energy Performance & Path Forward

The results and the progress of the ECDM and growth activities implemented over the past five years, and the projected impact of the new ECDM Plan is presented in the graph below. Erie Shores HealthCare has seen exponential growth over the last few years including increased inpatient and outpatient volumes, and expansion of our catchment area throughout Essex County which is reflective in the increase in energy usage over the past 5 years.

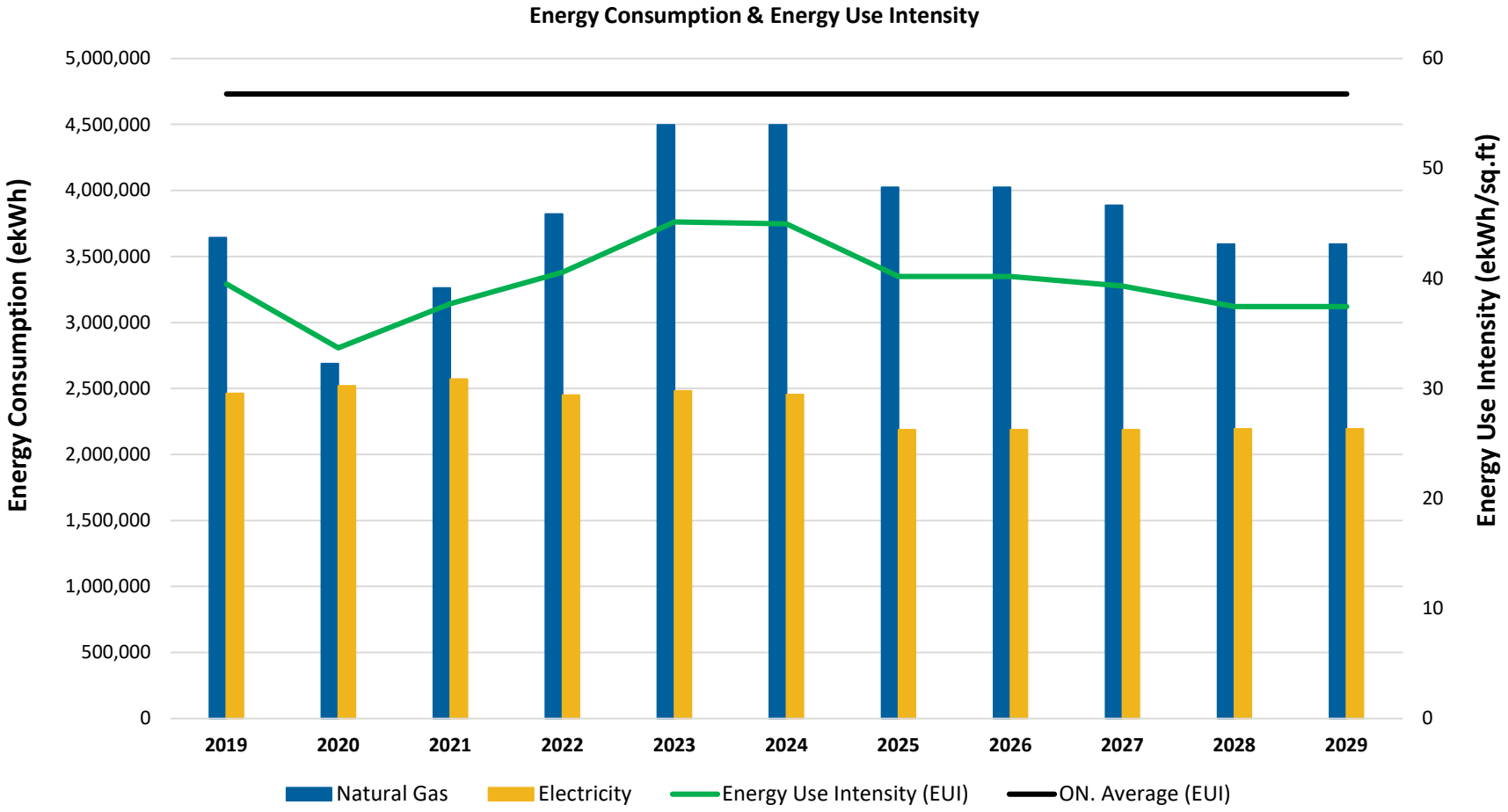

Figure 1. *Energy Consumption Trends & Projections*

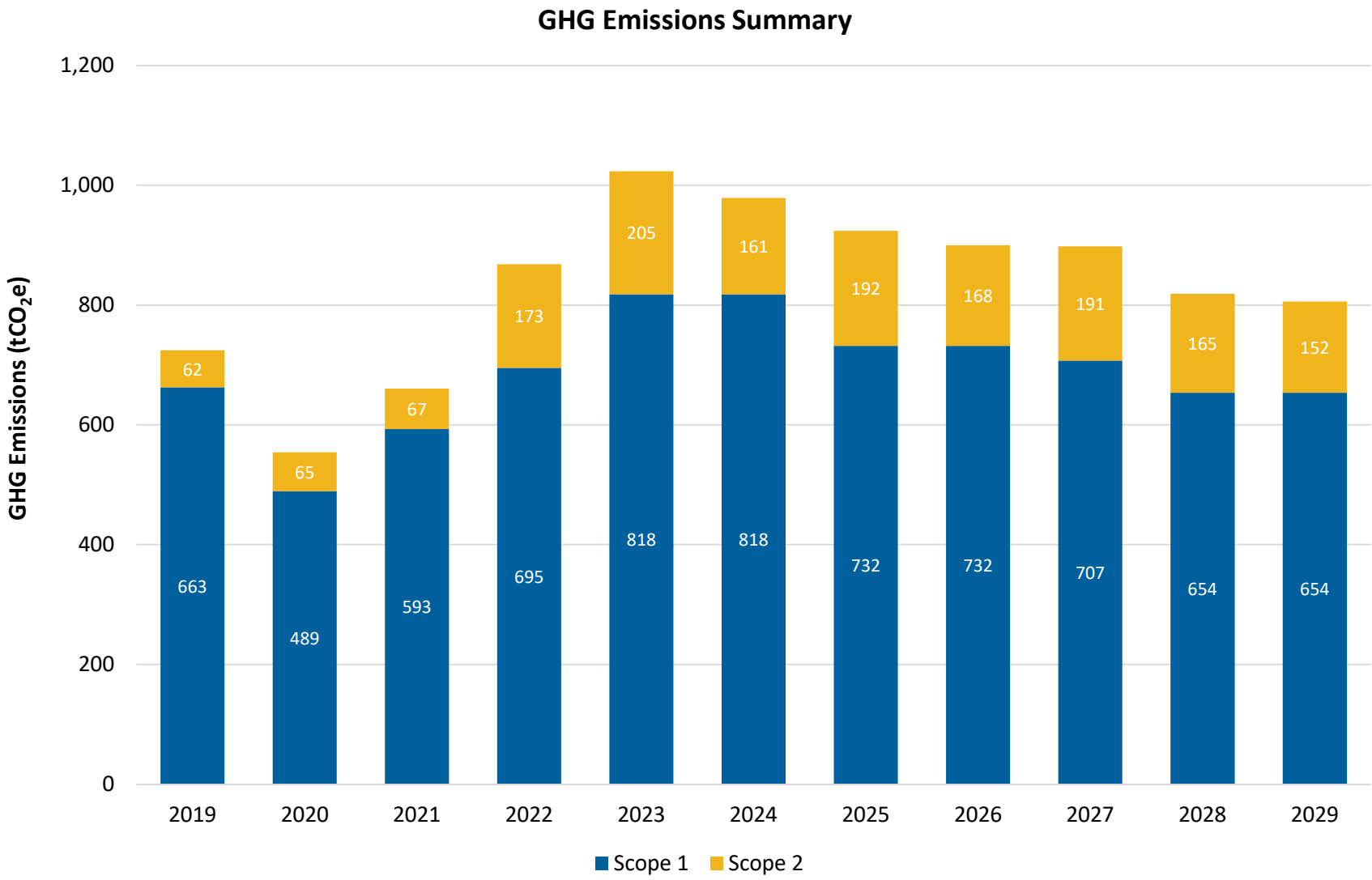

Figure 2. *GHG Emissions Trends & Projections*

3. About Erie Shores HealthCare

Figure 3. *Erie Shores HealthCare*

Erie Shores HealthCare is a 72-bed community hospital located in Essex County, Ontario, dedicated to providing high-quality medical care to its diverse population. The hospital offers a wide range of services, including emergency care, diagnostics, and specialized treatments in areas such as women's health, oncology, and surgical care. With a focus on patient-centered care and community involvement, Erie Shores HealthCare is committed to enhancing health services and planning for the future growth of healthcare in Essex County.

Erie Shores HealthCare Facility Information	
Facility Name	**Erie Shores HealthCare**
Type of Facility	Healthcare Facility
Address	194 Talbot St W, Leamington, ON N8H 1N9
Gross Area (Sq. Ft)	154,596
Average Operational Hours in a Week	168
Number of Beds	72

Table 1. *Erie Shores HealthCare Facility Information*

Strategic energy management can significantly improve ESHC's impact on the environment; improve the hospital's financial position by reducing unnecessary energy and utilities costs; and optimize the capacity of the existing systems to meet current and expanding operational needs. Change in energy related business practice will cover all applications of energy management including new construction and major renovations, existing facility operations and upgrades, and economic analysis and procurement practices. As ESHC continues to grow a strategic approach must be taken in order to obtain full value from energy management activities, and to strengthen our conservation initiatives.

Erie Shores HealthCare Mission/ Vision/ Values

Figure 4. *Erie Shores HealthCare Values*

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 hospitals (derived from Natural Resources Canada's Commercial and Institutional Consumption of Energy Survey), which was found to be 56.77 ekWh/sq. ft. ESHC is currently below the comparator hospital average.

Year	2019	2020	2021	2022	2023
Erie Shores HealthCare	39	34	38	41	45

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

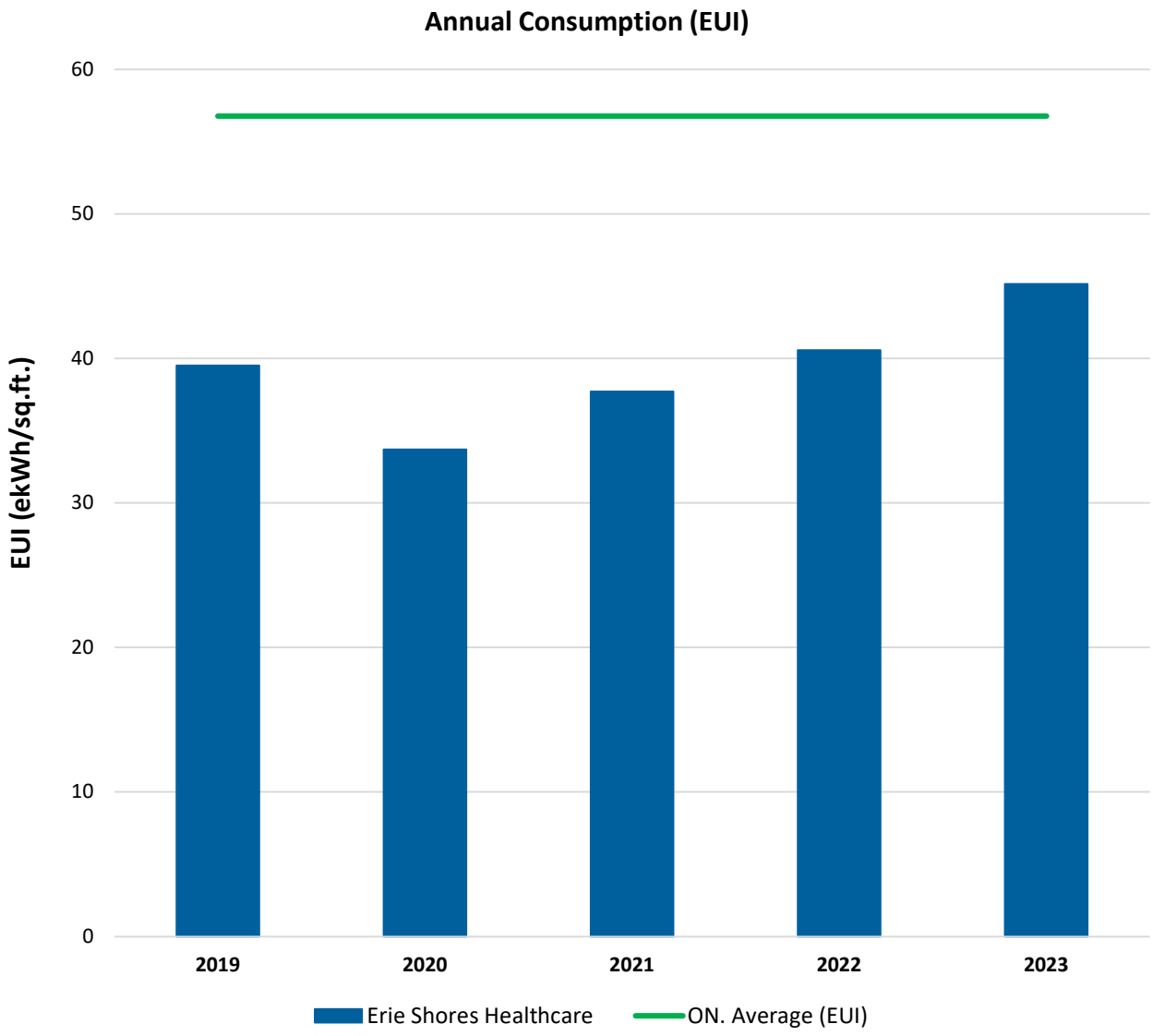

***Figure 5.** Historic Annual Energy Utilization Indices*

4.2. Historical utility Consumption Analysis

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)	2,463,128	2,520,439	2,570,131	2,448,369	2,481,484
Natural Gas (m^3)	345,000	254,608	308,729	361,893	425,850

***Table 3**. Historic Annual Utility Consumption*

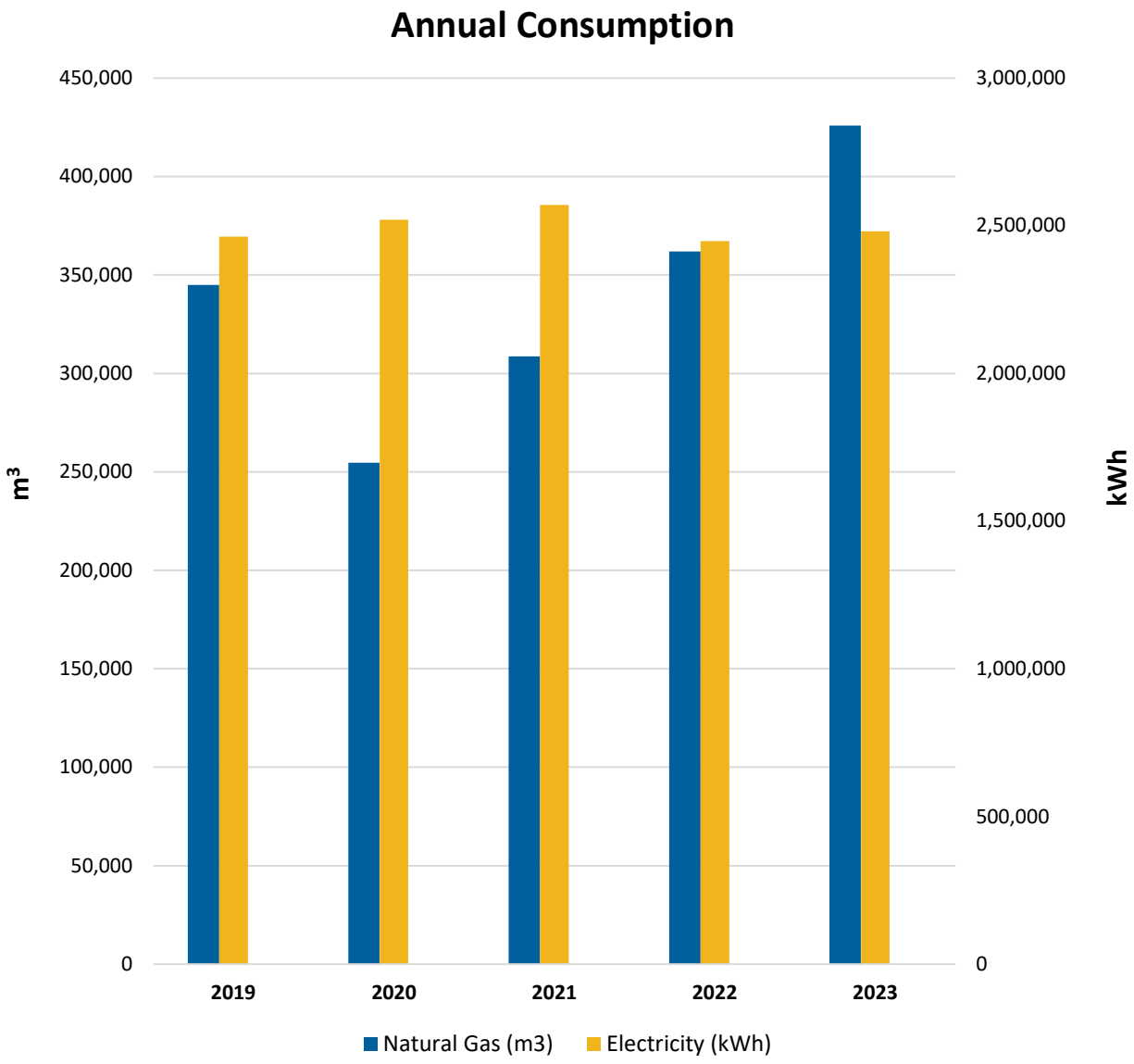

***Figure 6**. Historic Annual Utility Consumption*

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.

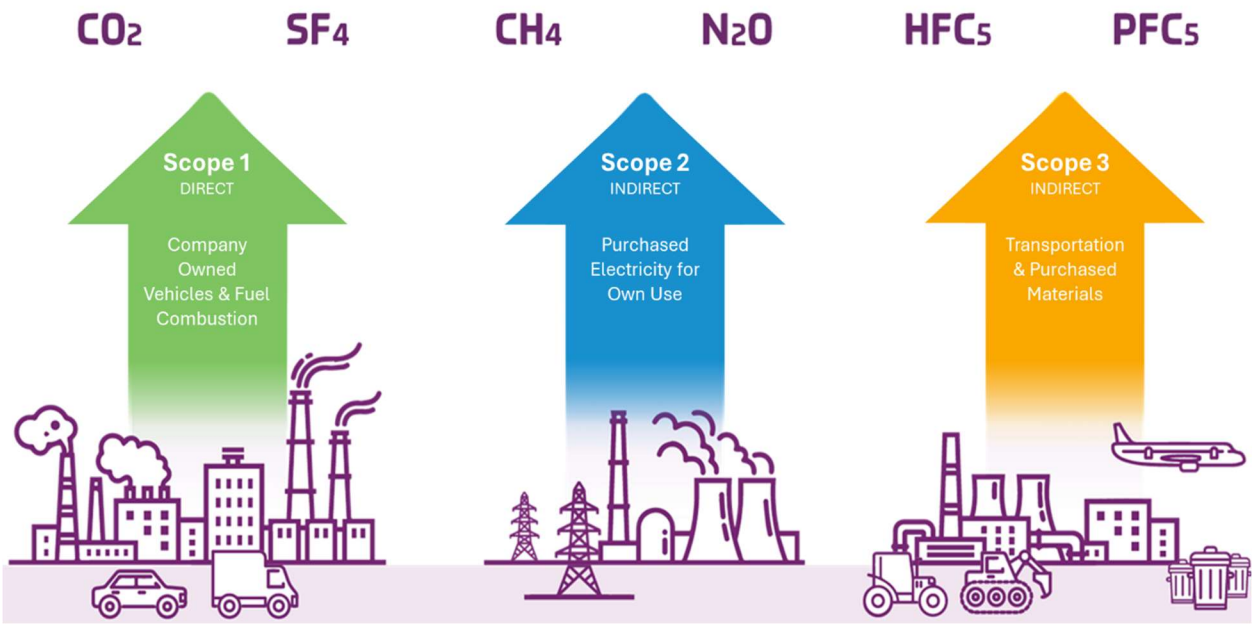

Figure 7. *Examples of Scope 1 and 2*

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

GHG Emissions (tCO2e)	2019	2020	2021	2022	2023
Natural Gas (Scope 1)	663	489	593	695	818
Electricity (Scope 2)	62	65	67	173	205
Total Scope 1 & 2 Emissions	**724**	**554**	**660**	**868**	**1,024**

Table 4. *Historic Greenhouse Gas Emissions*

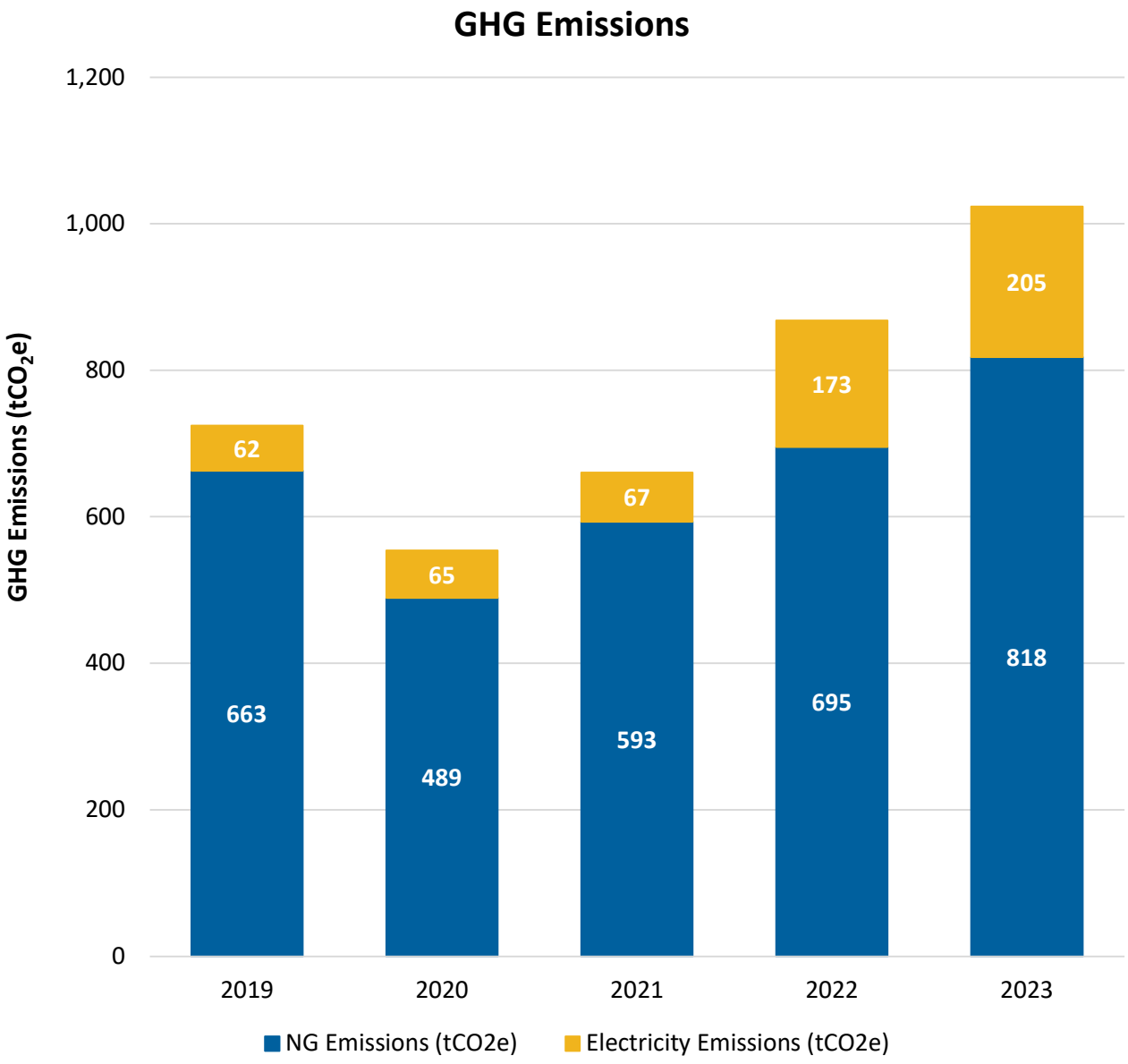

Figure 8. *Historical GHG Emissions*

5. Measures

5.1. Proposed Energy Conservation and GHG Reduction Measures

Our energy analysis has revealed the potential for a number of conservation and GHG reduction strategies for ESHC. Evaluated and proposed initiatives are summarized in the table on the following page outlining savings potential of the targeted utilities and estimated project costs, and a recommended year of implementation for each measure, strategically chosen to maximize ESHC energy conservation and GHG reduction benefits.

Measure	Estimated Annual Savings			Capital Project Cost ($)	Simple Payback (Years)	Potential Implementation Year
	Electricity (kWh)	Natural Gas (m^3)	Potential Savings ($)			
LED Upgrade, Patience Rooms & Parking Lot LED Replacement (50%) & Lighting Controls for Intermit Occupied Room	27,000	0	$4,050	$25,650	6.3	2024
Server and Electrical Room Temperature Setback	965	0	$145	-	0.0	2024
Window Replacement South Stairwell	7,444	5,323	$3,246	$202,500	62.4	2025
General Recommissioning/ BAS Upgrade	248,148	31,939	$49,998	$418,500	1.0	2025
Installing Low Flow Fixture for Hand Washing	0	12,776	$5,110	$55,688	10.9	2027
Add Insulation to Steam Piping	0	7,601	$2,508	$6,514	2.0	2025
Marley Cooling Tower Upgrade	9,566	0	$1,435	$729,000	N/A	2025
Energy Recovery System of AHUs to Capture Energy from Exhaust Air	-5,595	27,973	$9,007	$104,198	3.0	2028
Operating 2@650 kW Diesel Generators for Distributed Energy Resource Program	0	0	$122,265	-	N/A	2024
Total	**3,971**	**48,350**	**$140,325**	**$895,400**	**6.4**	**-**

Table 5. *Proposed Measures*

6. Erie Shores HealthCare Outlook

6.1. Utility Consumption Forecast

By implementing the recommended measures stated in the previous section, ERHC projected electricity and natural gas use could be forecasted based on the utility savings generated from individual measures.

	2024		2025		2026		2027		2028		2029	
	Units	% Change	Units	% Change	Units	% Change	Units	% Change	Units	% Change	Units	% Change
Natural Gas (m^3)	425,850	0%	380,987	11%	380,987	11%	368,212	14%	340,239	20%	340,239	20%
Electricity (kWh)	2,453,519	1%	2,188,361	12%	2,188,361	12%	2,188,361	12%	2,193,956	12%	2,193,956	12%

Table 6. *Forecast of Annual Utility Consumption from 2024 to 2029*

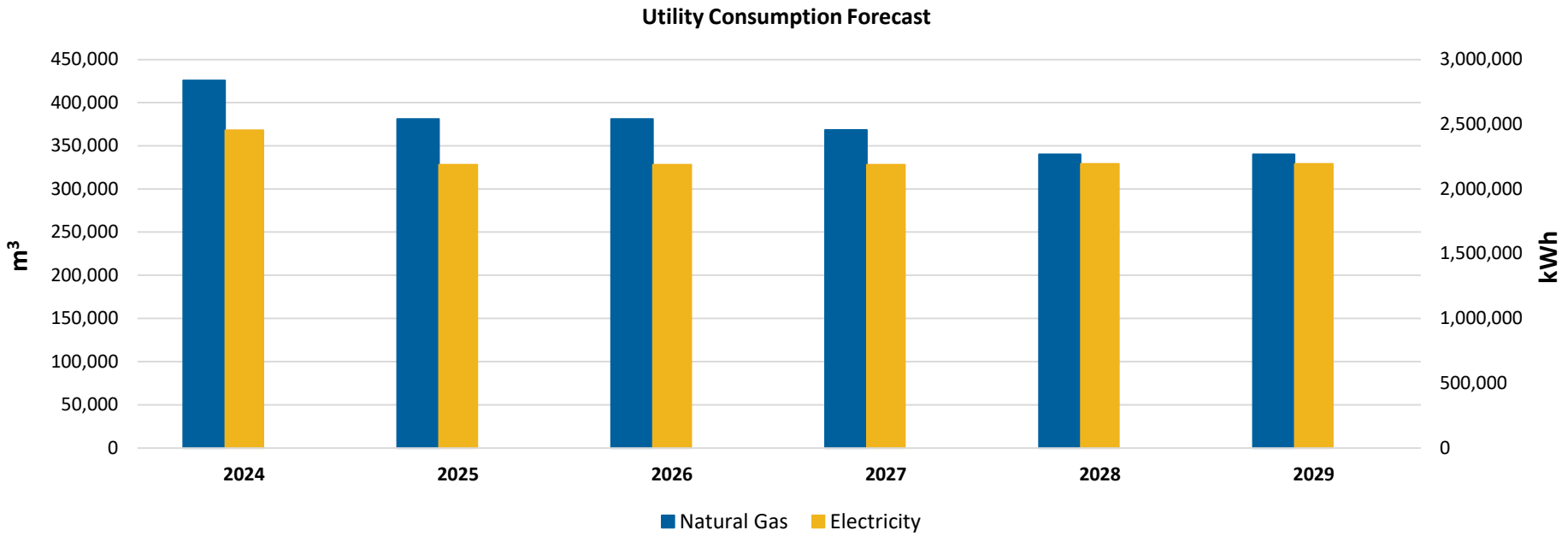

Figure 9. *Forecast of Annual Energy Consumption*

6.2. Site-Wide GHG Emissions Forecast

The organizational GHG emissions for ERHC are calculated based on the forecasted energy consumption data analyzed in the previous section and are tabulated in the following table. The percentage reduction is based on the baseline year of 2023.

Utility Source (tCO2e)	2024	2025	2026	2027	2028	2029
Natural Gas (scope 1)	818	732	732	707	654	654
Electricity (scope 2)	161	192	168	191	165	152
Totals	**979**	**924**	**900**	**898**	**819**	**806**
Reduction from Baseline Year	**4%**	**10%**	**12%**	**12%**	**20%**	**21%**

Table 7. *Forecast of Annual Greenhouse Gas Emissions from 2024 to 2029*

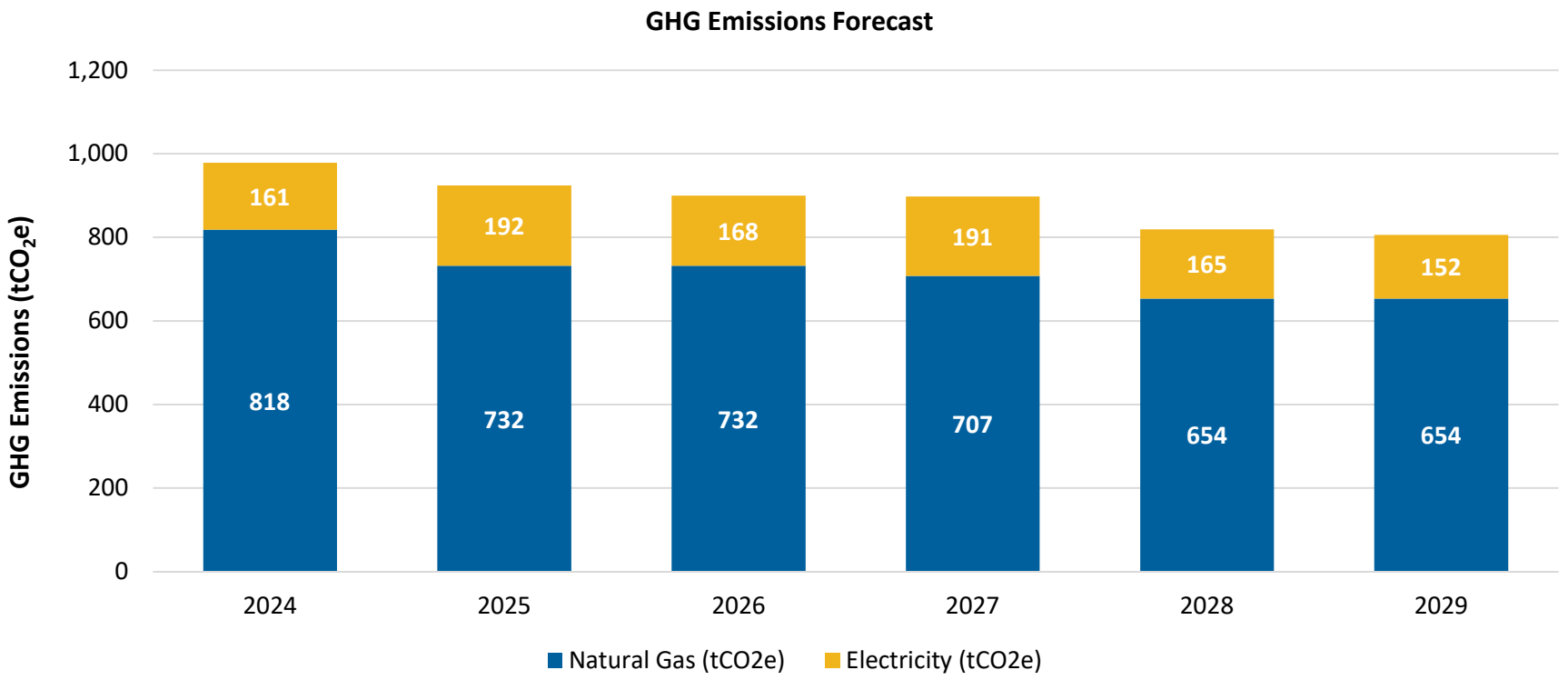

Figure 10. *Forecast of Annual Greenhouse Gas Emissions*

7. Closing Comments

Thank you to all who contributed to Erie Shores HealthCare's Energy Conservation & Demand Management Plan. Erie Shores HealthCare is an integral part of the local community and it is our responsibility to be stewards of the environment. It is important for the entire community that ESHC use our facility 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 Leadership Team here at Erie Shores HealthCare, we approve this Energy Conservation & Demand Management Plan.

X_____

Beth Hall
Vice President, Corporate Services, Capital and Strategic Planning
Erie Shores HealthCare

This ECDM plan was created through a collaborative effort between Erie Shores HealthCare and Blackstone Energy Services.

8. Appendix 1: Proposed Measure Details

M1. LED Upgrade, Patient Rooms & Parking Lot LED Replacement (50%) & Lighting Controls for Intermit Occupied Rooms

Existing Condition
Currently the existing lighting above the patient rooms was observed to be non-LED lighting. It is understood that roughly 50% of parking lighting has been replaced with LEDs.

Proposed Measure Description
It is recommended to consider installing LED lighting above patient beds to improve energy efficiency. It is recommended to replace the remaining non-LED parking lighting with LED alternatives. Additionally, this measure would include installing occupancy sensors in intermittently occupied spaces.

Energy Saving Method
The existing lighting is one T5 39W per patient room. It is recommended to replace this with a 13W LED alternative. It is assumed each light operates for 6 hours per day on average.

This measure would consider the replacement of the remaining 50% of parking lot lighting from the current HID lighting estimated at 400W, to be updated to a 150W alternative.

M2. Server and Electrical Room Temperature Setback

Existing Condition
The temperature setpoints of the split AC systems were observed to be set at 67 F in the server and electrical rooms.

Proposed Measure Description
It is recommended to consider adjusting the temperature setpoints in the server and electrical rooms to 72F.

Energy Saving Method
It is assumed the temperature is increased from 68F to 72F, for operating hours of 24/7.

M3. Window Replacement South Stairwell

Existing Condition
The Curtain Wall system for the south stairwell was observed to be original construction with single pane construction.

Proposed Measure Description
This measure considers replacing the current south stairwell Curtain Wall system with a high-performance triple pane alternative.

Energy Saving Method
It is estimated (based on the age and condition) the current performance of the Curtain Wall system is at U value of ~5 W/m2K. It is recommended to install a triple pane Curtain Wall system with a U value of 0.5 W/m2K

M4. General Recommissioning/BAS Upgrade

Existing Condition
As a result of the additions, change of space use and change of controls from pneumatic to DDC, some of the control points may not be on the BAS system. The operational requirements of the system also could change over time and drift from original intent

Proposed Measure Description
This measure considers upgrading the existing control system away from the remaining pneumatic and to a system with integration between all major systems. In addition, during the time of the upgrade, it is recommended to engage a certified commissioning professional to review all systems and provide an updated sequence of operations where applicable to optimize the operation

Energy Saving Method
This measure captures the benefits of:

1. Adding control points for the boilers to the BAS system.
2. Chilled water plant optimization: A review of the chilled water plant will be conducted to identify areas of energy savings. This would include but isn't limited to reviewing pumping power, chilled water temperature reset, condenser water temperature reset, variable speed pumps/drives, or other strategies identified during the review.
3. Conducting a retro-commissioning exercise for each air handling unit (AHU) and the spaces it serves. The following outlines the possible scope of the recommissioning exercise.
    a. Meet with the users of the space and the building operators to identify and document the specific requirements of the space in terms of occupancy, setpoints, and airflow requirements.
    b. Execute functional testing on the systems to confirm proper operation of individual components as well as the overall air handling system.

c. Identify opportunities for the repair of failed components and for the improvement of control sequences with respect to energy-efficiency.
d. Implement agreed-upon measures with the assistance of a controls contractor and other contractors as required.
e. Ensure that the building operators and occupants are trained on changes that are implemented and trained on how to optimally operate the systems and make required changes.
f. Note that there are currently incentives available for this work through the SaveOnEnergy program for both the investigation and implementation of measures that generate energy savings.
g. Costing provided is an estimate for the investigation phase of the work. Costs for implementing any energy saving measures would be in addition to the pricing provided.

4. Removal of all Pneumatic controls systems and savings from removing the central compressor.

This would result in a reduction in natural gas and electricity use. Savings are based on similar studies based on facility type, area, observed control points, and conditions.

M5. Installing Low Flow Fixture for Hand Washing

Existing Condition
Hand washing fixtures were observed to be high flow 2.5 GPM faucets.

Proposed Measure Description
It is recommended to consider installing lower flow fixtures in the range of 1.5-2.0 GPM which would still provide sufficient flow for hand washing.

Energy Saving Method
It is assumed that the flow rate would be reduced to 1.5 GPM for each faucet which results in a reducing water flow, consumption and natural gas use.

M6. Add insulation to Steam Piping

Existing Condition
Currently, it is understood that steam piping insulation is missing or lacking in certain areas.

Proposed Measure Description
This measure would consider replacing or adding insulation to reduce thermal losses from the steam system.

Energy Saving Method
This measure would capture the savings from adding steam piping insulation and the reduction in heating loss and natural gas consumption.

M7. Marley Cooling Tower Upgrade

Existing Condition
Currently, the Marley cooling tower was observed to be near end of life and a replacement should be considered.

Proposed Measure Description
It is recommended to replace the cooling tower with a new higher efficiency alternative.

Energy Saving Method
This measure estimates savings from upgrading the cooling tower. Energy savings would be a result of improved airflow, high efficiency fan, variable speed fan and improved control opportunities.

M8. Energy Recovery System of AHUs to Capture Energy from Exhaust Air

Existing Condition
Many of the packaged RTUs that were observed do not have Energy Recovery System (or ERV) from the exhaust air implemented.

Proposed Measure Description
It is understood that several renovations are currently planned for the facility to improve the space use which would require new AHUs. It is recommended to consider implementing units with Energy Recovery System to capture energy from the exhaust air.

Energy Saving Method
This measure would consider installing ERV on the RTUs to recapture 40-80 percent of the energy of the exhausted building air.

M9. Operating 2@650 kW Diesel Generators for Distributed Energy Resource Program

The Town of Leamington has recently experienced substantial growth in electrical demand due to the large number of greenhouses being constructed within the area. This situation has resulted in a severe electrical overload at Essex Hydro's 2, main transformers. The IESO is committed to expanding their high voltage electrical feeds to the town. The upgrade will take many years to clear the routing path, fund, design and construct.

EPLC (Essex Powerlines Corporation) has initiated a pilot project to demonstrate the capabilities of a wireless solution controlled by a Local Distribution Company (LDC). Their intention is to encourage local, voluntary load control assets to perform as demand reducers whenever needed. EPLC will act as a Distribution System Operator through the implementation of a local, near-real time energy market utilizing the Distributed Energy Resources (DER) in the project target area.

Erie Shores Hospital has recently installed 2x650 kW generators for life safety and possible islanding of their site. These generators are currently planned to be used by the hospital for emergency situations only.

This equipment can also be of assistance to the local electric utility, thru co-ordinated DER efforts. If proven to be effective, this program could stop the Town of Leamington from experiencing electrical supply issues until system reinforcement is achieved.

Below is a summary of benefits from participating with Essex Powerlines Corporation – DER Pilot program:

- Providing assistance to the local MEU when electrical demand exceeds current transformer capacity. This may delay/eliminate any voltage drops for Leamington. Otherwise, brown outs and rotating blackouts are a real possibility.
- The positive public response will be created to a government funded entity like the hospital working with the local hydro to develop a non-wires solution to a multi-million-dollar expansion of the hydro grid which will take many years.
- Erie Shores can produce a cash flow by operating their engines. The capital project was required for life safety reasons and is a useful asset to engage.
- Participation in this IESO Pilot will ensure Erie Shores becomes a leader amongst their institutional peer group and will gain positive DSM credibility across the province.
- There is no cost or risk to Erie Shores for their participation.

Market participants who trade energy flexibility via the NODESmarket platform can earn revenue from ShortFlex and LongFlex products.

The revenue stream is difficult to calculate at this time as the market will determine the clearing prices and can be varied based on the level of participation from zero to an estimated maximum of $122,265 (based on 1.3 MW and EPLC electrical cost projections for 2024).

9. Appendix 2: 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 building's 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.

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