

Energy Conservation & Demand Management Plan

2024 - 2029



William Osler
Health System

Contents

1. Regulatory Update	4
2. Executive Summary	5
2.1. William Osler Health System's Energy Performance & Path Forward	6
3. About William Osler Health System	8
3.1. Corporate Sustainability	9
3.2. Corporate Strategic Energy Management Roadmap	9
3.3. Guiding Principles for Strategic Energy Management	11
4. Site-Wide Historical Analysis	12
4.1. Site-Wide Historical Energy Intensity	12
4.2. Site-Wide Historical GHG Emissions	13
4.3. Completed Energy Conservation Measures Data	15
5. Site Analysis	17
5.1. Brampton Civic Hospital	17
5.1.1. Utility Consumption Analysis	18
5.1.2. GHG Emissions Analysis	18
5.1.3. Proposed Conservation Measures	19
5.1.4. Utility Consumption Forecast	20
5.1.5. GHG Emissions Forecast	21
5.2. Etobicoke General Hospital	22
5.2.1. Utility Consumption Analysis	23
5.2.2. GHG Emissions Analysis	23
5.2.3. Proposed Conservation Measures	24
5.2.4. Utility Consumption Forecast	25
5.2.5. GHG Emissions Forecast	26
5.3. Peel Memorial Centre	27
5.3.1. Utility Consumption Analysis	28
5.3.2. GHG Emissions Analysis	28
5.3.3. Proposed Conservation Measures	29
5.3.4. Utility Consumption Forecast	30
5.3.5. GHG Emissions Forecast	31
5.4. Withdrawal Management Centre	32
5.4.1. Utility Consumption Analysis	33

5.4.2.	GHG Emissions Analysis	33
5.4.1.	Proposed Conservation Measures	34
5.4.2.	Utility Consumption Forecast	35
5.4.3.	GHG Emissions Forecast	36
6.	Site-Wide Outlook.....	37
6.1.	Site-Wide Utility Consumption Forecast	37
6.2.	Site-Wide GHG Emissions Forecast	38
7.	Closing Comments	39
8.	Appendix	40
8.1.	Glossary of terms.....	40
8.2.	List of Pictures, Tables & Figures	41

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 The Bill repealed the GEA and all its underlying Regulations, including O. Reg. 397/11.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

2. Executive Summary

This Energy Conservation and Demand Management (ECDM) Plan provides renewed guidance and focus of the William Osler Health System's ("Osler") 2019 Strategic Energy Management Plan. This ECDM Plan outlines specific actions and measures that will promote energy conservation, stewardship of the environment and community resources to 2029. This ECDM Plan will look at future projections of energy consumption, review past conservation measures, and chart the path of planned energy conservation measures.

Osler remains committed to our mission to provide innovative health care delivered with compassion and our values of Respect, Excellence, Innovation, Service, Compassion, and Collaboration. This ECDM Plan details our strategy to reduce overall energy consumption, operating costs, and greenhouse gas emissions. By adhering to the measures in this document, we aim to deliver compassionate healthcare to our community. The ECDM Plan complies with O. Reg. 25/23 of the amended Electricity Act, 1998.

Through our past energy conservation and demand initiatives, we have achieved the following results:

- 12,982 kWh reduction in electricity use since 2019

In 2023:

- Our organization's Energy Use Index (EUI) was 70.13 ekWh/ft²
- Our total energy-related emissions equaled 24,474 tCO₂e

To obtain increased value from energy management activities, Osler will take a strategic approach to integrate energy management into its business decision-making, policies and operating procedures. This active management of energy usage will provide a significant economic return and will support other key organizational objectives.

With this prominent focus on energy management, Osler can expect to achieve the following goals and targets by 2029:

- 6% reduction in electricity consumption
- 3% reduction in natural gas consumption
- 7% reduction in carbon equivalent emissions

2.1. William Osler Health System's Energy Performance & Path Forward

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

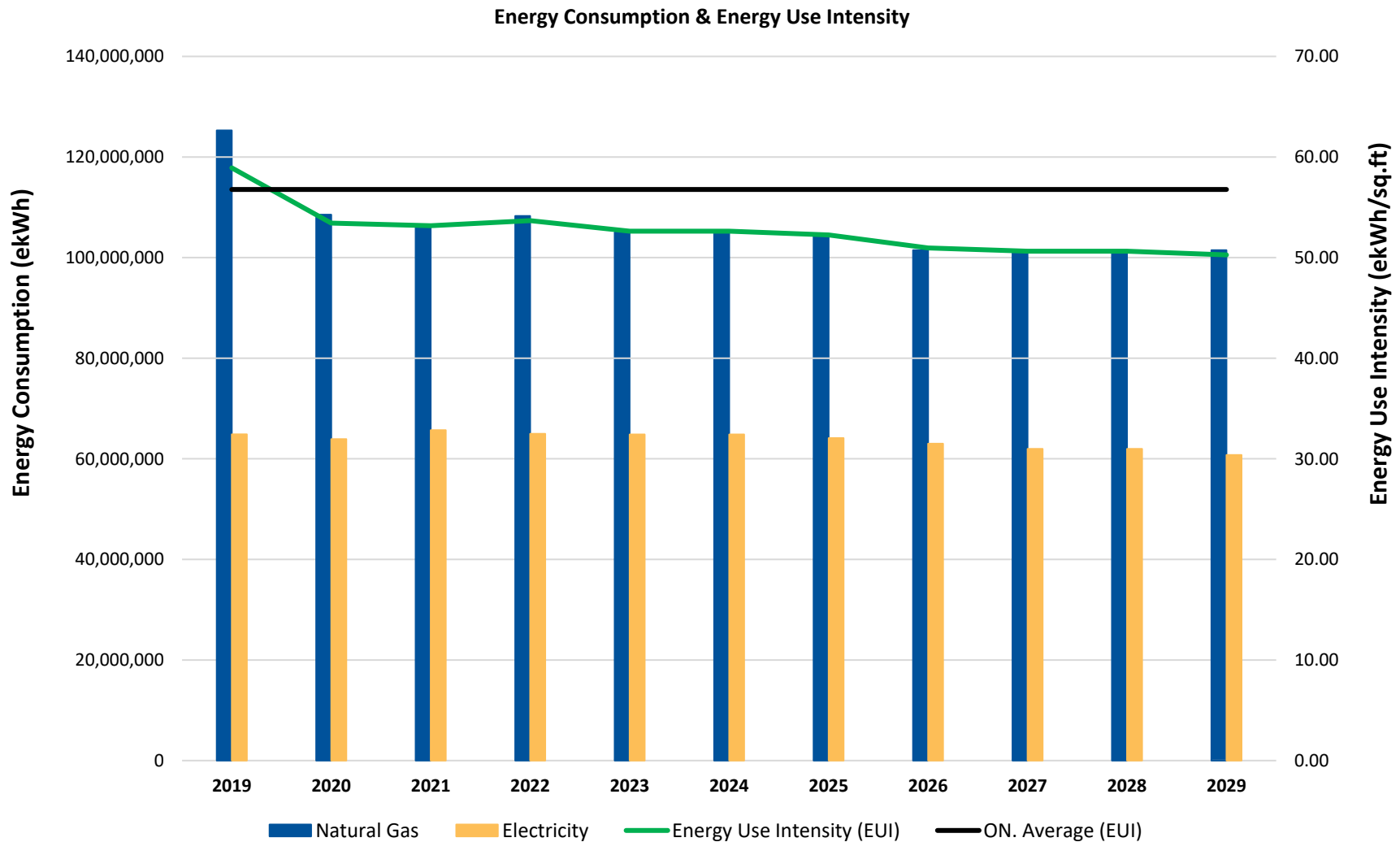


Figure 1. Site-Wide Energy Consumption Trends & Projections

	2019	2020	2021	2022	2023
Natural Gas (ekWh)	125,302,679	108,529,661	105,907,866	108,288,037	105,017,658
Electricity (ekWh)	64,867,795	63,923,747	65,689,624	64,966,541	64,854,813
Energy Use Intensity (ekWh/sq. ft)	58.92	53.43	53.17	53.68	52.63
Energy Use Intensity Ontario Average (ekWh/sq.ft)	56.77	56.77	56.77	56.77	56.77

	2024	2025	2026	2027	2028	2029
Natural Gas (ekWh)	105,017,658	104,545,274	101,471,946	101,471,946	101,471,946	101,471,946
Electricity (ekWh)	64,854,813	64,119,463	63,012,361	61,977,361	61,977,361	60,766,453
Energy Use Intensity (ekWh/sq. ft)	52.63	52.26	50.96	50.64	50.64	50.27
Energy Use Intensity Ontario Average (ekWh/sq.ft)	56.77	56.77	56.77	56.77	56.77	56.77

Table 1. Site-Wide Energy Consumption Trends & Projections

3. About William Osler Health System

Osler supports one of the fastest growing regions in Ontario and the demand for our services is ever growing. This growth drives the need for new facilities to support the growing demand and, while the addition of facilities inherently grow our physical footprint, Osler has committed to leverage the opportunity of new facilities to dilute our energy intensity through innovative and sustainable designs.

The opening of Peel Memorial added 600,000 sq.ft. to our physical footprint, while at same time, reduced our energy intensity by 30%. Additionally, in 2019, a new Patient Tower was constructed adding a new four-storey wing, approximately 235,000 sq. ft, to the existing facility and houses the services most urgently needed by the Etobicoke community. The Phase 1 Patient Tower Project focused on sustainable design and construction with the goal of achieving Leadership in Energy and Environmental Design (LEED®) Silver certification.

These achievements result from a relentless focus on sustainability and Osler will continue to focus on the opportunities presented by redevelopment to dilute our energy intensity and green our aggregate footprint with the development of Peel Phase 2 over the next several years.

Osler's facilities are the vessel through which it delivers care and the foundation for the healing environment. The efficient and effective operation of our facilities is not only in keeping with our values of respect, excellence, innovation, service, compassion, and collaboration but, through efficient application of resources, facilitates the organization's pursuit of the broader mission and vision.

Osler's Strategic Energy Management Vision is to transcend the boundaries posed by aging facilities, the constraints of project agreements and limited capital funding through innovative approaches to operations, infrastructure renewal and energy conscious cultural evolution to optimize facility efficiency and best support our organizational mission, vision and values.

The ECDM Plan sets forth to leverage opportunities for infrastructure renewal and operational ECMs within the context of our redevelopment agenda; while fostering an energy conscious culture amongst our staff to optimize energy efficiency and best support Osler's core mission of delivering innovative healthcare with compassion through redevelopment and beyond.

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 integrate energy management into our practices by considering indoor environmental quality, operational efficiency and sustainably sourced resources when making financial decisions.

William Osler Health System is a network of hospitals that serves the residents of Brampton, Etobicoke, and surrounding communities within the Central West Local Health Integration Network. Our network is made up of 3 hospitals – Brampton Civic Hospital, Etobicoke General Hospital, and Peel Memorial Centre – and serves over 1.3 million residents.

We have a team of dedicated physicians, nurses and volunteers that strive to achieve excellence in health care, and we are committed to equipping our facilities with the state-of-the-art tools that are needed to change and save lives, every day.

Our Mission

Innovative health care delivered with compassion

Our Vision

Patient-inspired health care without boundaries

Our Values

Respect, Excellence, Innovation, Service, Compassion, Collaboration

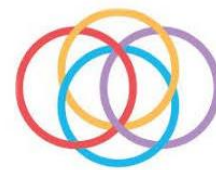


Figure 2. Osler Logo

3.1. Corporate Sustainability

Osler is committed to reduce their environmental impact and will create the Osler Energy Sustainability and Environmental Committee (OESEC). This committee will provide strategic direction and oversight in energy and sustainability project planning and implementation, ensuring alignment with corporate vision and values. Osler has committed to implementing these teams to provide guidance on environmentally conscience issues throughout the organization.

3.2. Corporate Strategic Energy Management Roadmap

In an effort to renew the focus of the 2019 Strategic Energy Management Plan (“SEMP”), Osler is restating the eight essential steps on our corporate journey towards reaching our energy and sustainability goals. The sub-point following the goal indicates our progress to date.

Steps and progress to reach Osler's goal:

- Build the right teams driven by the right leadership support - (OESEC / Green Teams /facilities management)
 - Establishment of Osler Green Team is now being driven as part of Accreditation
 - OESEC Terms of Reference have been drafted and have been submitted for executive review
- Establish Energy Baselines (calendar year 2023)
 - Energy Baselines have been created and monitored through RETScreen Expert Software
 - Osler's Energy Manager has completed training and is a Certified RETScreen Expert
- Set targets and goals at each of Osler's sites for both short-term and long-term reduction in energy use and GHG emissions
 - Targets and goals have been identified in this ECDM Plan
- Establish a Strategic Energy Management Plan that integrates all aspects of energy management across the corporation providing guiding principles and goals and objectives that are attainable and realistic.
 - This ECDM Plan provides governance structure, guiding principles, and a path to achieve goals for Osler through 2029.
- Implement the necessary infrastructure upgrade projects at each of Osler's hospital sites.
 - Infrastructure upgrade and energy conservation projects are listed in sections 5.1.3, 5.2.3, 5.3.3 and 5.4.3 for each respective site.
- Track, measure, and report on energy use and GHG reductions related to infrastructure improvements
 - Currently, energy project performance is performed through IPMVP Option C – whole building approach when applicable.
- Train, educate and celebrate – informed staff, are engaged staff. Recognizing individual and collective efforts through awards and other recognition programs provides opportunity
 - Pending direction from OESEC

3.3. Guiding Principles for Strategic Energy Management

The following principles will serve to guide corporate energy management planning at Osler:

Taking A Strategic Approach: While Osler actively manages energy and utility costs by implementing opportunities as they are identified, by acting strategically, the Hospital can significantly improve its energy-related performance. Understanding the synergies between energy management objectives and other organizational priorities will shape and integrate the energy management agenda into the broader organizational strategy for optimal effect. Internalizing energy and utility management into our organization's everyday decision-making, policies, and operating procedures will help assure substantial and long-lasting reductions in energy use throughout the William Osler Health System.

Supporting Mission-Critical Goals: Strategic energy management will directly support Osler's mission-critical goals of caring for the environment and the community. It will also help the Hospital to optimize the healing and working environment; improve the hospital's financial bottom line by reducing unnecessary energy and utility costs; and optimize the capacity of existing energy systems to meet current and expanding operational needs. The impacts of Osler's energy management efforts on those goals will be tracked and reported.

Pursuing Long-Term Change to Core Business Practices: The core of a strategic approach is the consistent incorporation of energy and utility management into our organization's core practices and decision making, such as the strategic planning and budgeting processes. Change in energy-related business practice will cover all applications of energy management - new construction and major renovations, existing facility operations and upgrades, and economic analysis and procurement practices.

Fostering Organizational Commitment and Involvement: Executive and organizational commitment and involvement is critical to successful strategic energy management. Osler facility managers will work with senior leaders and other key staff to ensure that adequate organizational support and resources are allocated to optimize the benefits of energy and utility management. Energy and utility management will be integrated into the strategic planning and capital budgeting processes.

Obtaining Solid Economic Returns: Energy management investments will yield solid economic returns that meet Osler's expectations on Internal Rate of Return (IRR) and Return on Investment (ROI). Osler will apply consistent financial analysis methods that consider life-cycle costs that reduce total cost of facility ownership and operation.

Using Available Resources and Assistance: Osler will leverage and foster its relationships with national, regional, and local sources of strategic, technical, and financial assistance to help achieve its energy management goals. These include programs through local distribution companies, the Ontario Power Authority, ENERGystar, saveONenergy, the Canadian Coalition for Green Health Care, The Canadian Healthcare Engineering Society, and EnerCan, along with Ministry of Health & Long-Term Care (MOHLTC) capital programs for renovation and upgrades.

4. Site-Wide Historical 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.**

Site	2019	2020	2021	2022	2023
Brampton Civic Hospital	51.54	49.18	49.92	52.24	52.32
Etobicoke General Hospital	78.74	86.57	85.01	83.85	80.23
Peel Memorial Centre	24.41	26.86	25.01	21.75	20.27
Withdrawal Management Centre	36.69	36.18	33.82	36.91	35.72

Table 2. Historic Energy Utilization Indices for all Sites

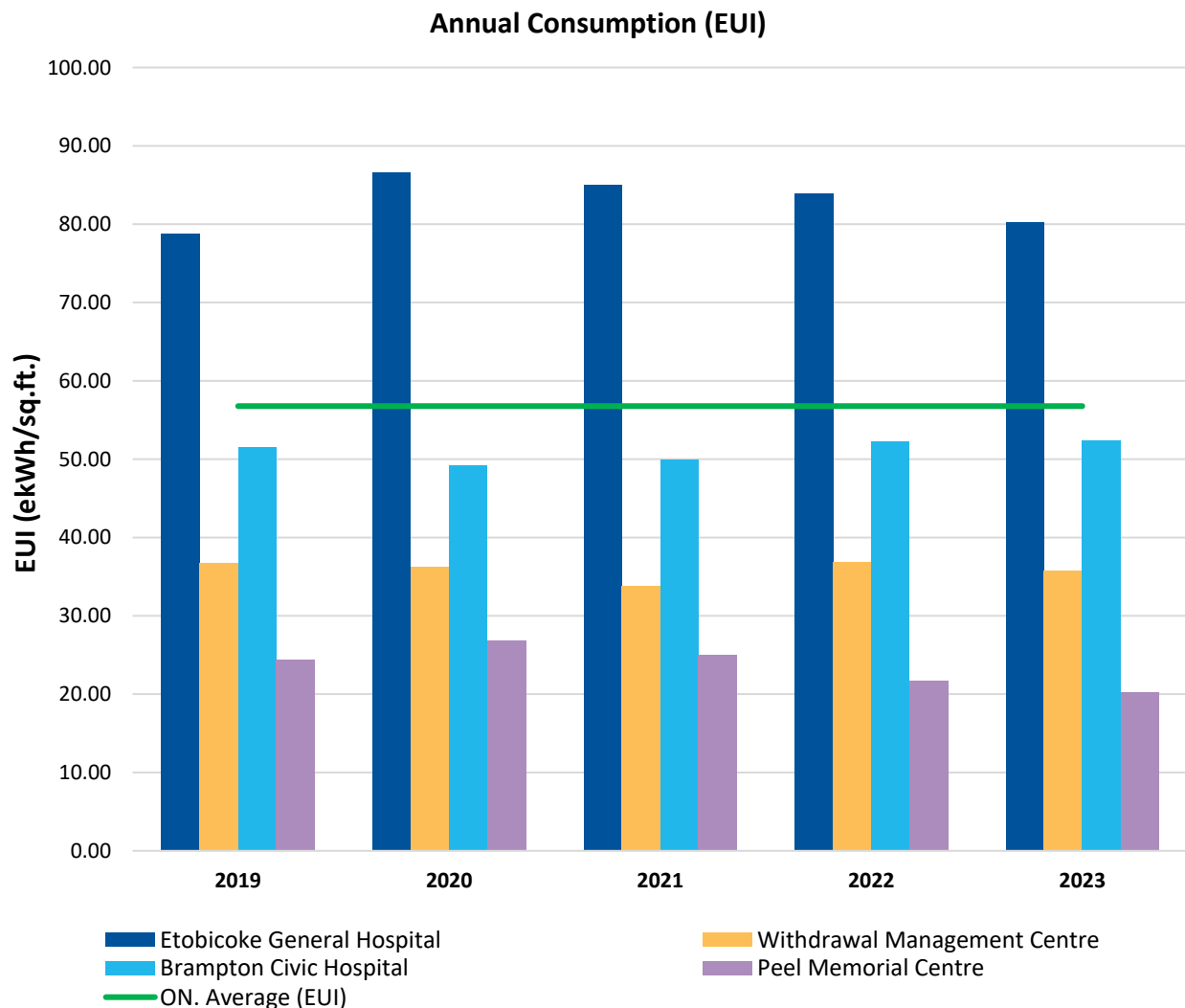


Figure 3. Historic Annual Energy Utilization Indices for all Sites

4.2. Site-Wide Historical GHG Emissions

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 nuclear power and 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.

The table below displays the emissions factors that were used to calculate the GHG emissions on the next page. Please note there was an increase in the emissions factors for 2022/2023 which caused an increase in the historic GHG emissions for Osler.

Emission Factors	2019	2020	2021	2022	2023
Natural Gas (tCO ₂ e/m ³)	0.001921	0.001921	0.001921	0.001921	0.001921
Electricity (tCO ₂ e/kWh)	0.000025	0.000026	0.000026	0.000071	0.000083

Table 3. GHG Emission Factors

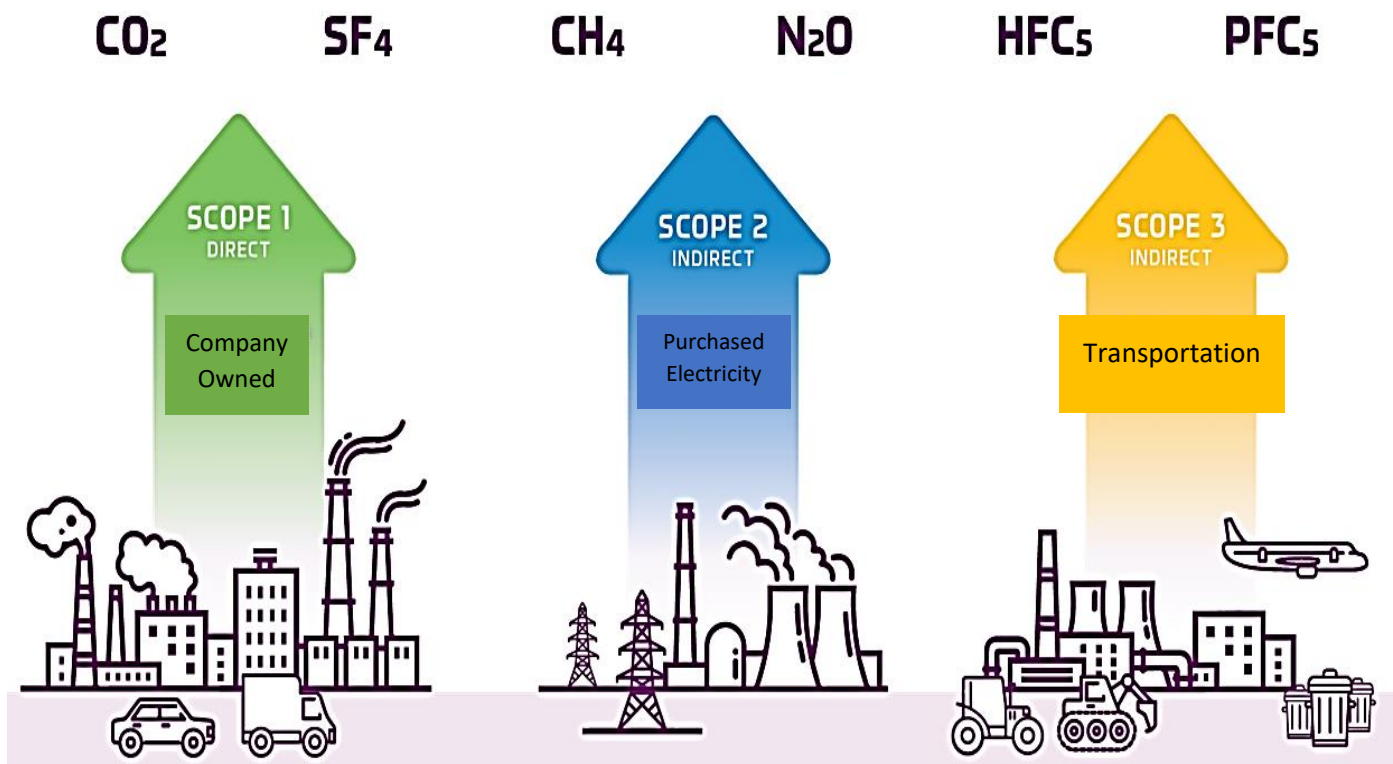


Figure 4. Examples of Scope 1, 2, 3

The site-wide greenhouse gas emissions for Osler have been tabulated and are represented in the table and table below.

GHG Emissions	2019	2020	2021	2022*	2023*
Electricity (scope 2)	1,622	1,649	1,721	4,587	5,370
Natural Gas (scope 1)	19,088	19,743	19,266	19,699	19,104
Total Scope 1 & 2 Emissions	20,710	21,392	20,987	24,286	24,474

*2022/2023 spike is due to the increased GHG emission factors

Table 4. Historic Greenhouse Gas Emissions for all Sites

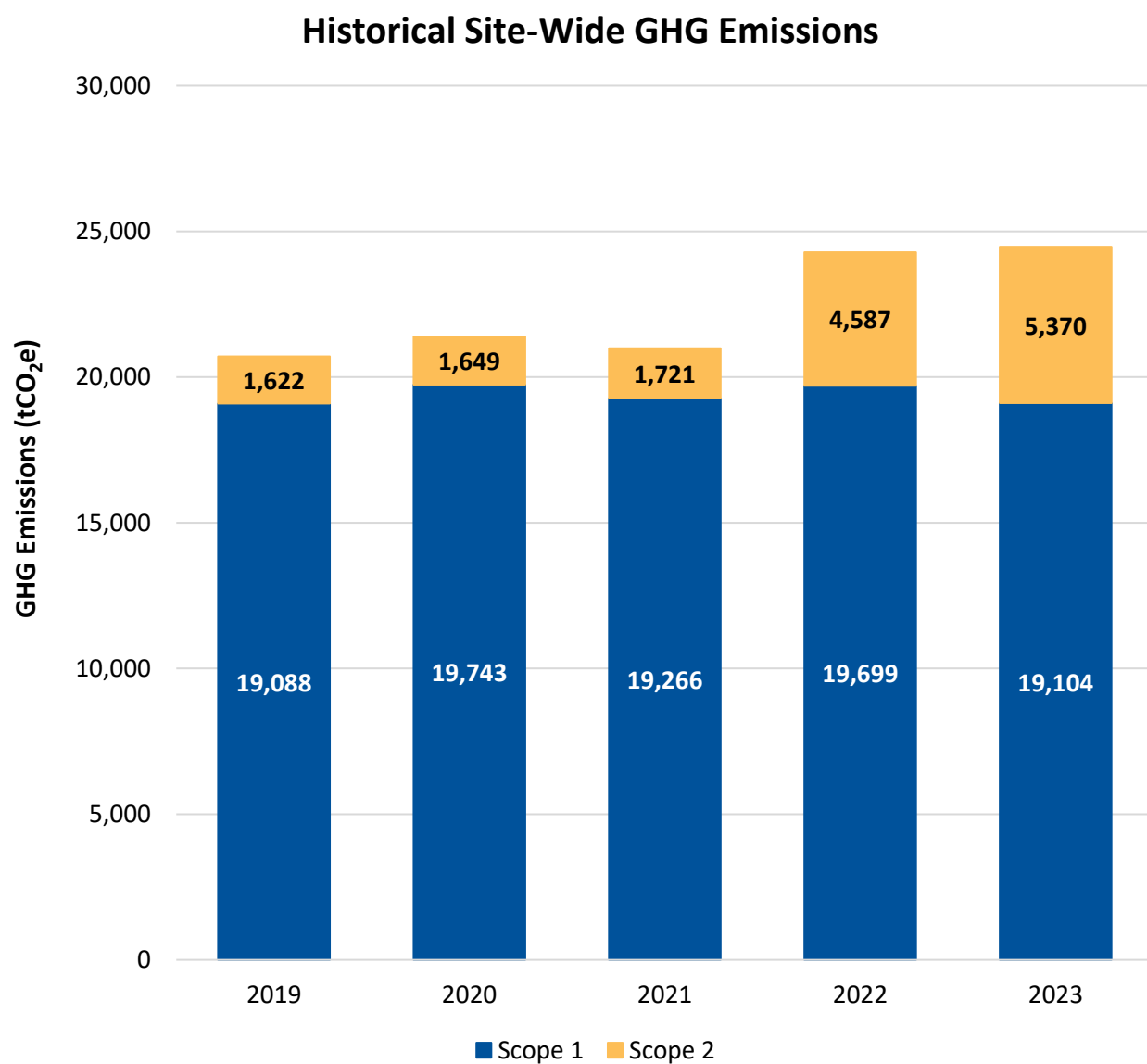


Figure 5. Historic Greenhouse Gas Emissions for all Sites

4.3. Completed Energy Conservation Measures Data

The chart below outlines the estimated annual savings and implementation data of the measures completed prior to 2023.

Site	Measure	Estimated Cost (\$)	Estimated Savings (\$)	Estimated Annual Savings		Simple Payback (years)	Year of Implementation	Lifecycle of Measure
				kWh	m3			
Etobicoke General Hospital	LED Lighting Retrofit	\$131,687	\$25,219	186,056	0	6.08	2018	10 Years
Etobicoke General Hospital	Steam Jackets	\$52,820	\$0	0	61,817	3.72	2019	25 Years
Etobicoke General Hospital	Remaining Steam Jackets	\$21,212	\$0	0	39,595	2.33	2019	25 Years
Etobicoke General Hospital	EGH Chiller Optimization	\$288,000	\$88,399	645,768	0	3.26	2018	10 Years
Etobicoke General Hospital	Corridor lighting - Floor 05	\$14,626	\$1,167	8,410	0	12.42	2020	10 Years
Etobicoke General Hospital	Corridor lighting - Floor 04	\$10,021	\$1,184	8,410	0	8.51	2021	10 Years
Etobicoke General Hospital	BAS Optimization Pilot	\$50,000	\$5,027	35,714	21,739	5	2021	Ongoing
Etobicoke General Hospital	Boiler Linkageless Controls	\$560,000	\$34,804	0	116,013	15.26	2022	20 Years
Etobicoke General Hospital	LED Lighting Upgrade	\$250,000	\$66,851	468,407	0	3.81	2022	10 Years
Etobicoke General Hospital	Exit Lights Retrofit	\$25,000	\$6,504	43,362	0	3.84	2019	20 Years
Etobicoke General Hospital	Removed water cooled HVAC cooler - MDRD	\$1,000					2020	20 Years
Etobicoke General Hospital	Replaced water cooled BioFridge cooler	\$5,000					2021	20 Years

Etobicoke General Hospital	Replace water cooled HVAC cooler - Telephone Room	\$10,000					2023	20 Years
Etobicoke General Hospital	Upgrade 6 Constant Volume pumps to VFD C/W Heat Exchanger	\$130,000					2021	20 Years
Etobicoke General Hospital	AHU Heat Wheel VFD	\$140,000					2019	20 Years
Etobicoke General Hospital	AHU and VAV Scheduling	N/A	\$49,750	815,007	30,200	N/A	2022	Ongoing
Etobicoke General Hospital	Pump Sequencing	N/A	\$174	1,425		N/A	2023	Ongoing
Etobicoke General Hospital	Enthalpy Wheel Optimization	N/A	\$22,678	117,856	23,338	N/A	2023	Ongoing
Etobicoke General Hospital	Procedure Room Air Changes Optimization							Ongoing
Peel Memorial Centre	Boiler Plant Optimization	\$20,000	\$47,201	0	111,093	0.42	2023	Ongoing
Brampton Civic Hospital	BCH Lighting Upgrade	\$321,352	\$102,013	755,655	0	2.63	2017	10 Years
Brampton Civic Hospital	Ambulance Bay Lighting	\$30,000	\$9,065	66,221	0	3.24	2019	10 Years
Brampton Civic Hospital	Parkade Lighting Retrofit	\$321,352	\$102,013	755,655	0	2.63	2018	10 Years

Table 5. Completed Conservation Measures

5. Site Analysis

The following section will introduce each of our sites and provide a brief description about the building and its operations, energy & greenhouse gas (GHG) emissions trends, and specific conservation measures.

5.1. Brampton Civic Hospital



Picture 1. Brampton Civic Hospital

Brampton Civic Hospital opened in 2007 and is one of the busiest emergency departments in Canada. We are a full-service community hospital with many specialized services including a critical care response team, cardiac catheterization suite, a Regional Kidney Wellness Centre, a Centre for Complex Diabetes Care and an expansive Mental Health and Addictions program.

Facility Information	
Facility Name	Brampton Civic Hospital
Type of Facility	Healthcare Services
Address	2100 Bovaird Drive East, Brampton, ON
Gross Area (Sq. Ft)	1,895,09
Average Operational Hours in a Week	168
Number of Floors	6
Number of Beds	608

Table 6. Brampton Civic Hospital Facility Information

5.1.1. 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 normalized to a calendar year (365 days).

Utility	2019	2020	2021	2022	2023
Electricity (kWh)	35,677,249	34,524,701	36,069,787	35,981,873	36,085,108
Natural Gas (m³)	5,871,041	5,556,258	5,542,542	5,968,035	5,971,584

Table 7. Historic Annual Utility Consumption for the Brampton Civic Hospital

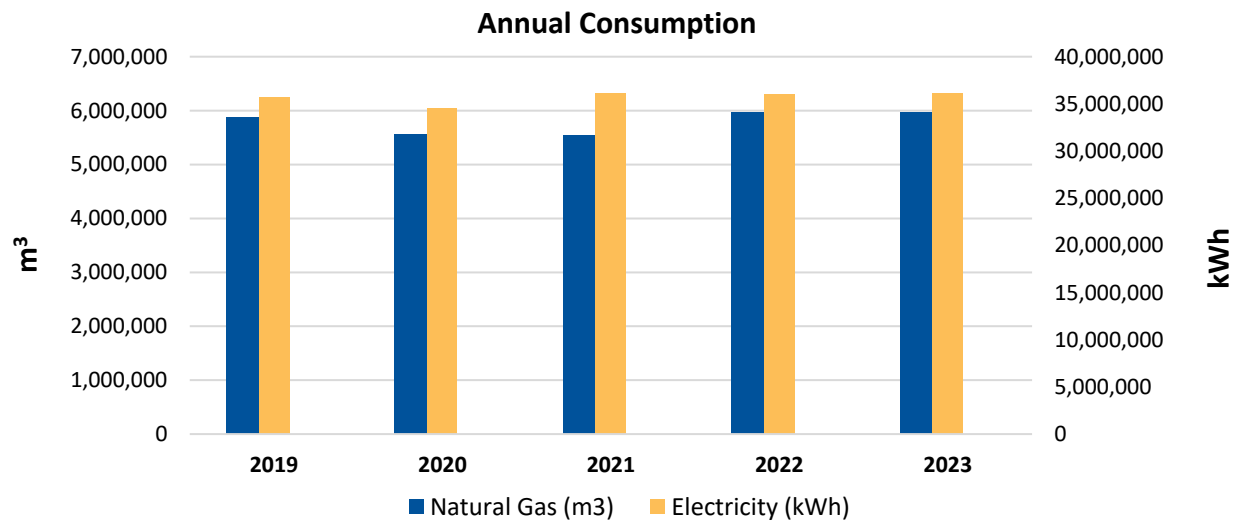


Figure 6. Historic Annual Utility Consumption for the Brampton Civic Hospital

5.1.2. GHG Emissions Analysis

The greenhouse gas emissions are calculated based on the energy consumption data analyzed in the following table.

Utility Source (tCO ₂ e)	2019	2020	2021	2022	2023
Electricity (scope 2)	892	891	945	2,540	2,988
Natural Gas (scope 1)	11,278	10,674	10,647	11,465	11,471
Totals	12,170	11,564	11,592	14,005	14,459

Table 8. Historic Annual Greenhouse Gas Emissions for the Brampton Civic Hospital

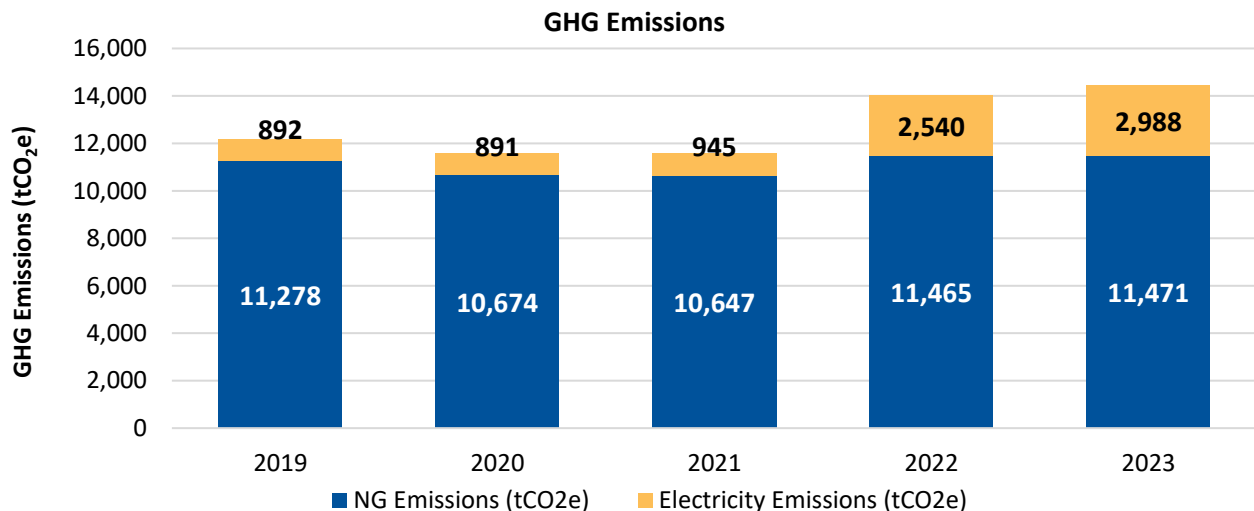


Figure 7. Historic Annual Greenhouse Gas Emissions for the Brampton Civic Hospital

5.1.3. Proposed Conservation Measures

In collaboration with the facility management team, a list of potential energy saving initiatives with anticipated project timelines has been created. Brampton Civic Hospital'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	Estimated Annual Savings			Project Cost	Simple Payback (Years)	Implementation Year
	Electricity (kWh)	Natural Gas (m ³)	Cost (\$)			
OR HVAC Upgrade	575,408	0	\$77,680	\$272,000	3.5	2029
Chiller Optimization	1,035,000	0	\$141,681	\$550,389	3.9	2027
Boiler/Steam Plant Optimization	790,393	291,324	\$111,248	\$116,375	1.0	2026
Exterior Lighting	197,000	0	\$28,510	\$250,000	8.8	2026
Parking Garage - Solar	635,500	0	\$93,256	\$1,048,000	11.2	2029
Boiler Blowdown Heat Recovery Unit	0	44,733	\$13,420	\$45,000	3.4	2025
Total	3,233,301	336,057	\$465,795	\$2,281,764	4.9	-

Table 9. Proposed Conservation Measures for the Brampton Civic Hospital

5.1.4. 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 2023.

	2024		2025		2026		2027		2028		2029	
	Units	% Change	Units	% Change	Units	% Change	Units	% Change	Units	% Change	Units	% Change
Natural Gas (m³)	5,971,584	0%	5,926,851	1%	5,635,527	6%	5,635,527	6%	5,635,527	6%	5,635,527	6%
Electricity (kWh)	36,085,108	0%	36,085,108	0%	35,097,715	3%	34,062,715	6%	34,062,715	6%	32,851,807	9%

Table 10. Forecast of Annual Utility Consumption for the Brampton Civic Hospital

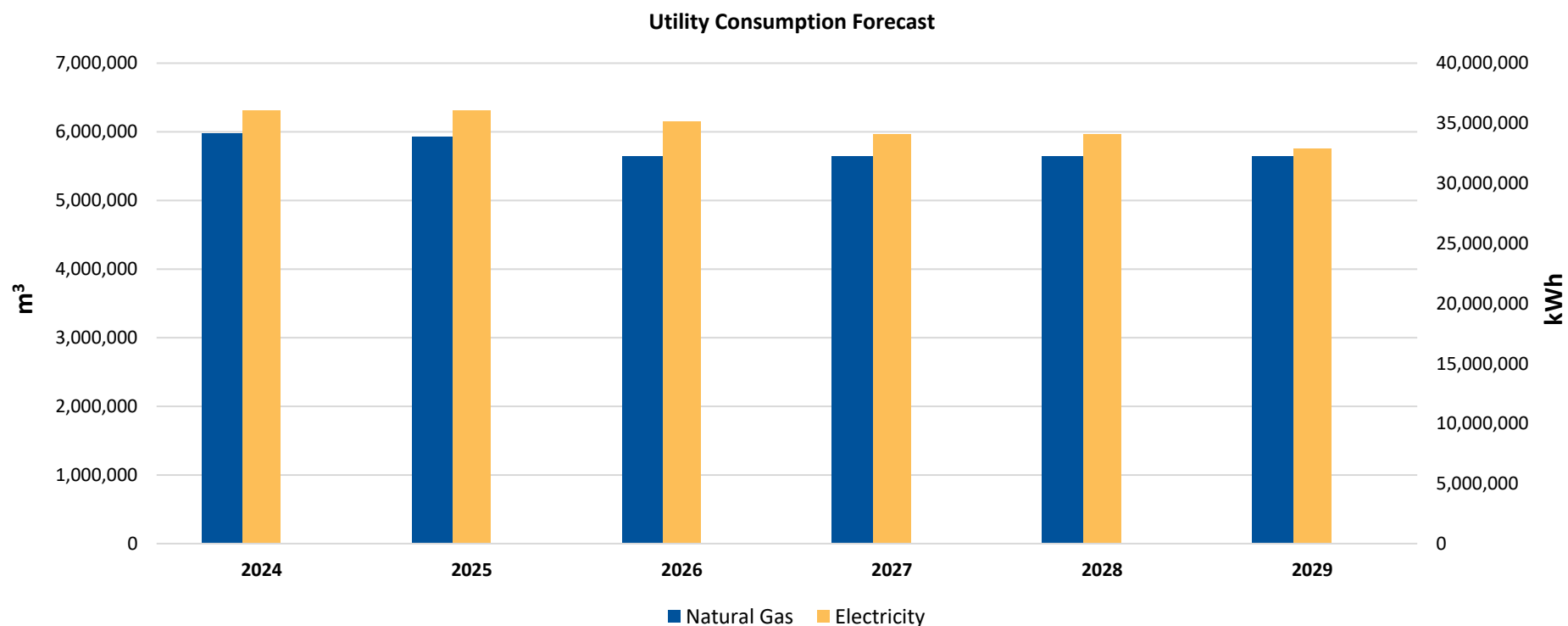


Figure 8. Forecast of Annual Utility Consumption for the Brampton Civic Hospital

5.1.5. 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 2023.

Utility Source (tCO ₂ e)	2024	2025	2026	2027	2028	2029
Natural Gas (scope 1)	11,471	11,385	10,826	10,826	10,826	10,826
Electricity (scope 2)	2,364	3,168	2,692	2,967	2,568	2,277
Totals	13,835	14,554	13,518	13,793	13,394	13,102
Reduction from Baseline Year	4%	1%	7%	5%	7%	9%

Table 11. Forecast of Annual Greenhouse Gas Emissions for the Brampton Civic Hospital

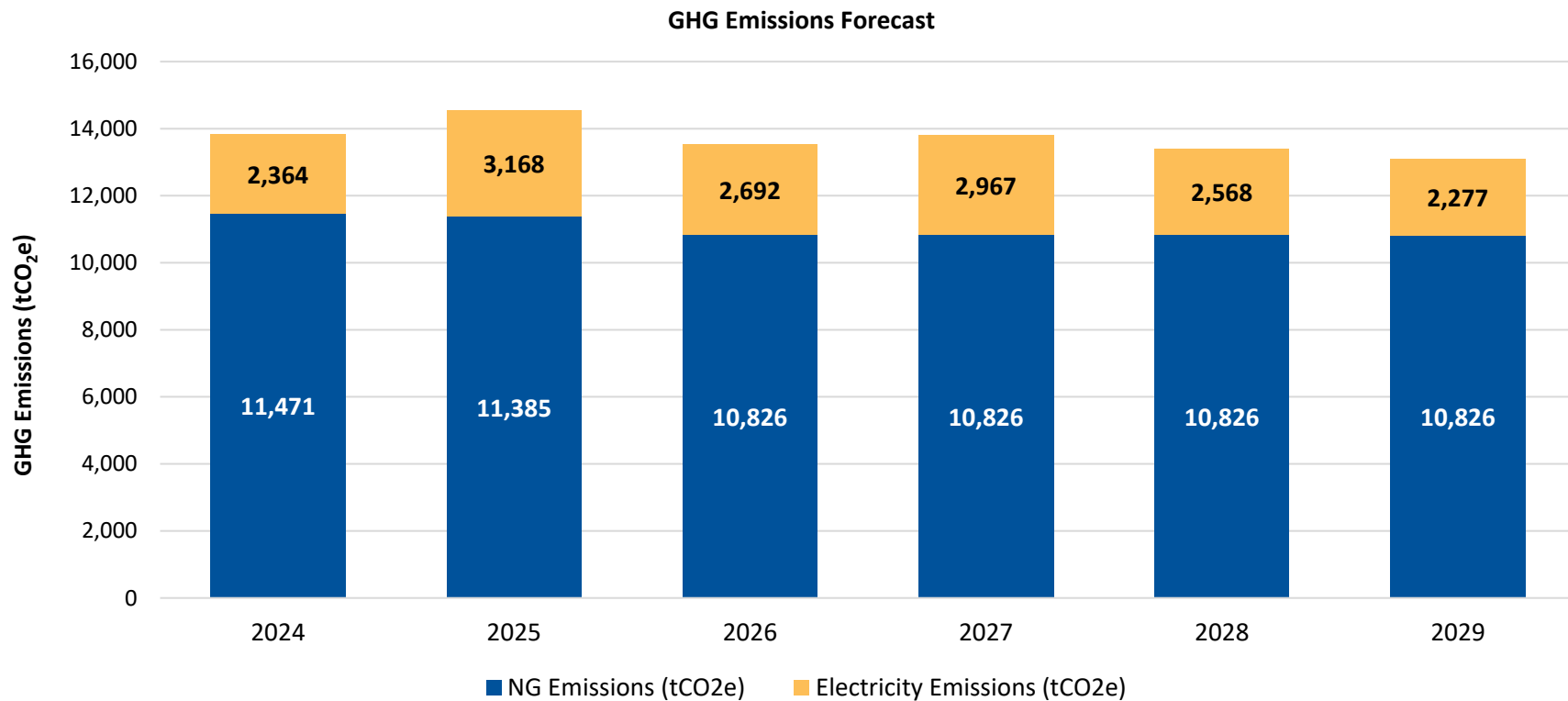


Figure 9. Forecast of Annual Greenhouse Gas Emissions for the Brampton Civic Hospital

5.2. Etobicoke General Hospital



Picture 2. Etobicoke General Hospital

Etobicoke general is a full-service community hospital serving the areas of Vaughan, Bolton, Caledon, East Mississauga, Northwest Toronto, and North Etobicoke. We provide a range of inpatient and outpatient care services. Each year we handle close to 70,000 emergency department patient visits, deliver more than 2,600 babies, and perform more than 14,700 surgeries.

In 2019, a new Patient Tower was constructed adding a new four-storey wing, approximately 235,000 sq. ft, to the existing facility and houses the services most urgently needed by the Etobicoke community. The Phase 1 Patient Tower Project focused on sustainable design and construction with the goal of achieving Leadership in Energy and Environmental Design (LEED®) Silver certification.

Facility Information	
Facility Name	Etobicoke General Hospital
Type of Facility	Healthcare Services
Address	101 Humber College Blvd., Etobicoke, ON
Gross Area (Sq. Ft)	726,175
Average Operational Hours in a Week	168
Number of Floors	10
Number of Beds	262

Table 12. Etobicoke General Hospital Facility Information

5.2.1. 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 normalized to a calendar year (365 days).

Utility	2019	2020	2021	2022	2023
Electricity (kWh)	20,277,225	20,730,005	21,217,370	20,375,504	20,101,198
Natural Gas (m ³)	3,494,765	3,989,946	3,836,566	3,836,680	3,613,472

Table 13. Historic Annual Utility Consumption for the Etobicoke General Hospital

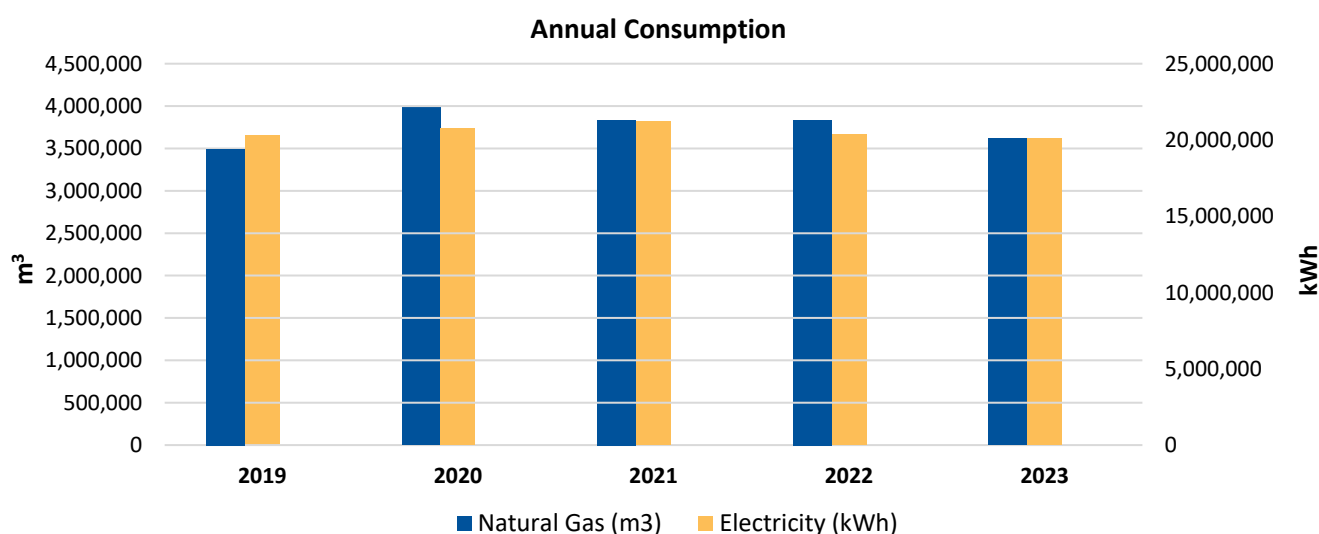


Figure 10. Historic Annual Utility Consumption for the Etobicoke General Hospital

5.2.2. GHG Emissions Analysis

The greenhouse gas emissions are calculated based on the energy consumption data analyzed in the following table.

Utility Source (tCO ₂ e)	2019	2020	2021	2022	2023
Electricity (scope 2)	507	535	556	1,439	1,664
Natural Gas (scope 1)	6,713	7,665	7,370	7,370	6,941
Totals	7,220	8,200	7,926	8,809	8,606

Table 14. Historic Annual Greenhouse Gas Emissions for the Etobicoke General Hospital

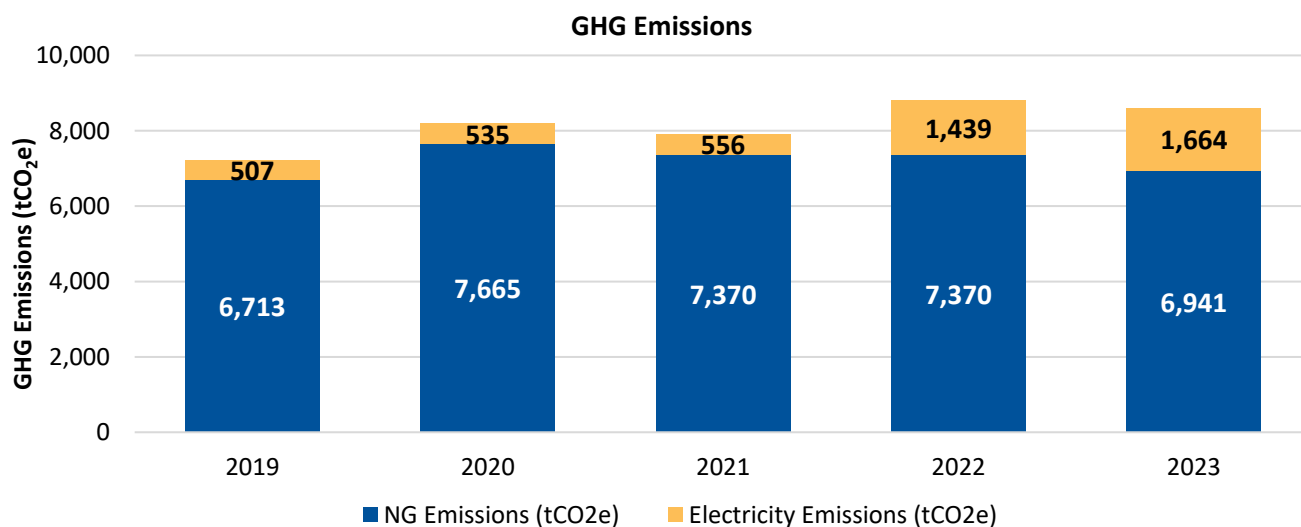


Figure 11. Historic Annual Greenhouse Gas Emissions for the Etobicoke General Hospital

5.2.3. Proposed Conservation Measures

In collaboration with the facility management team, a list of potential energy saving initiatives with anticipated project timelines has been created. Etobicoke General Hospital'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	Estimated Annual Savings			Project Cost	Simple Payback (Years)	Implementation Year
	Electricity (kWh)	Natural Gas (m ³)	Cost (\$)			
Rooftop Solar PV 303 kW	290,400	0	\$42,026	\$666,600	15.9	2025
LED Lighting Retrofit - 3 floors remaining	50,877	-289	\$6,782	\$75,000	11.1	2026
Chiller Optimization	444,950	0	\$53,400	\$160,000	3.0	2025
Total	786,227	-289	\$102,208	\$901,600	8.8	-

Table 15. Proposed Conservation Measures for the Etobicoke General Hospital

5.2.4. 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 2023.

	2024		2025		2026		2027		2028		2029	
	Units	% Change	Units	% Change	Units	% Change	Units	% Change	Units	% Change	Units	% Change
Natural Gas (m³)	3,613,472	0%	3,613,472	0%	3,613,761	0%	3,613,761	0%	3,613,761	0%	3,613,761	0%
Electricity (kWh)	20,101,198	0%	19,365,848	4%	19,314,971	4%	19,314,971	4%	19,314,971	4%	19,314,971	4%

Table 16. Forecast of Annual Utility Consumption for the Etobicoke General Hospital

Utility Consumption Forecast

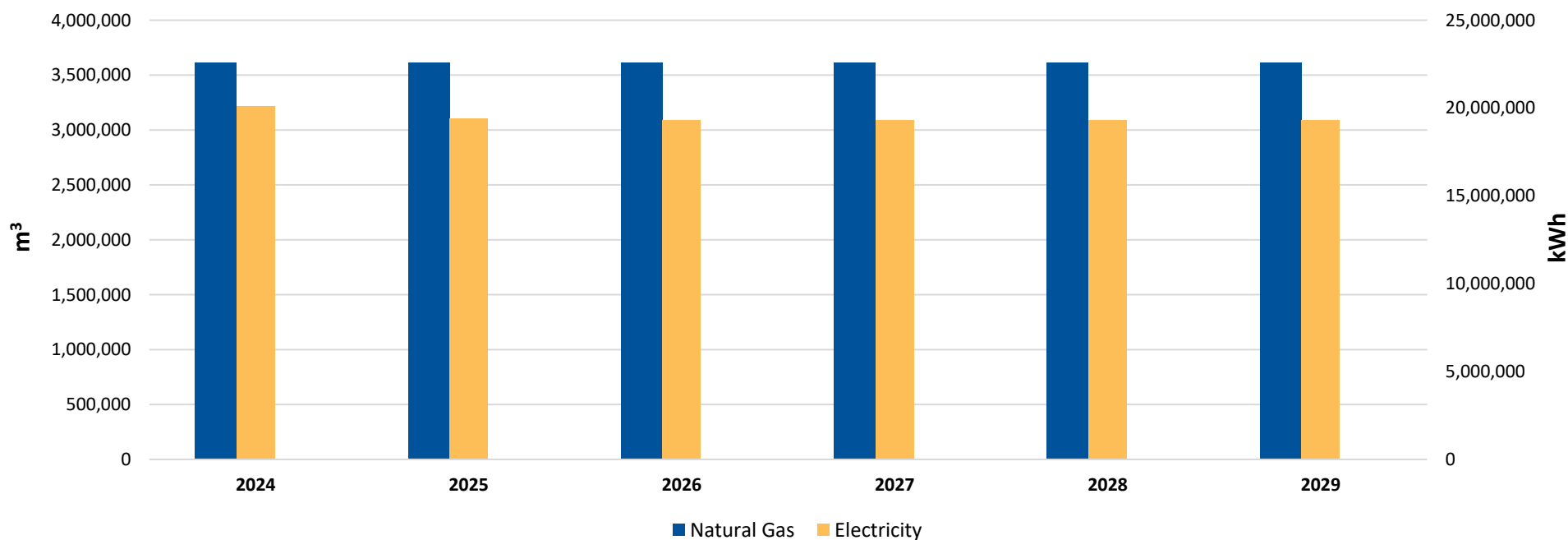


Figure 12. Forecast of Annual Utility Consumption for the Etobicoke General Hospital

5.2.5. GHG Emissions Forecast

The forecasted greenhouse gas emissions are calculated based on the 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 2023.

Utility Source (tCO ₂ e)	2024	2025	2026	2027	2028	2029
Natural Gas (scope 1)	6,941	6,941	6,942	6,942	6,942	6,942
Electricity (scope 2)	1,317	1,700	1,481	1,682	1,456	1,339
Totals	8,258	8,642	8,423	8,624	8,398	8,281
Reduction from Baseline Year	4%	0%	2%	0%	2%	4%

Table 17. Forecast of Annual Greenhouse Gas Emissions for the Etobicoke General Hospital

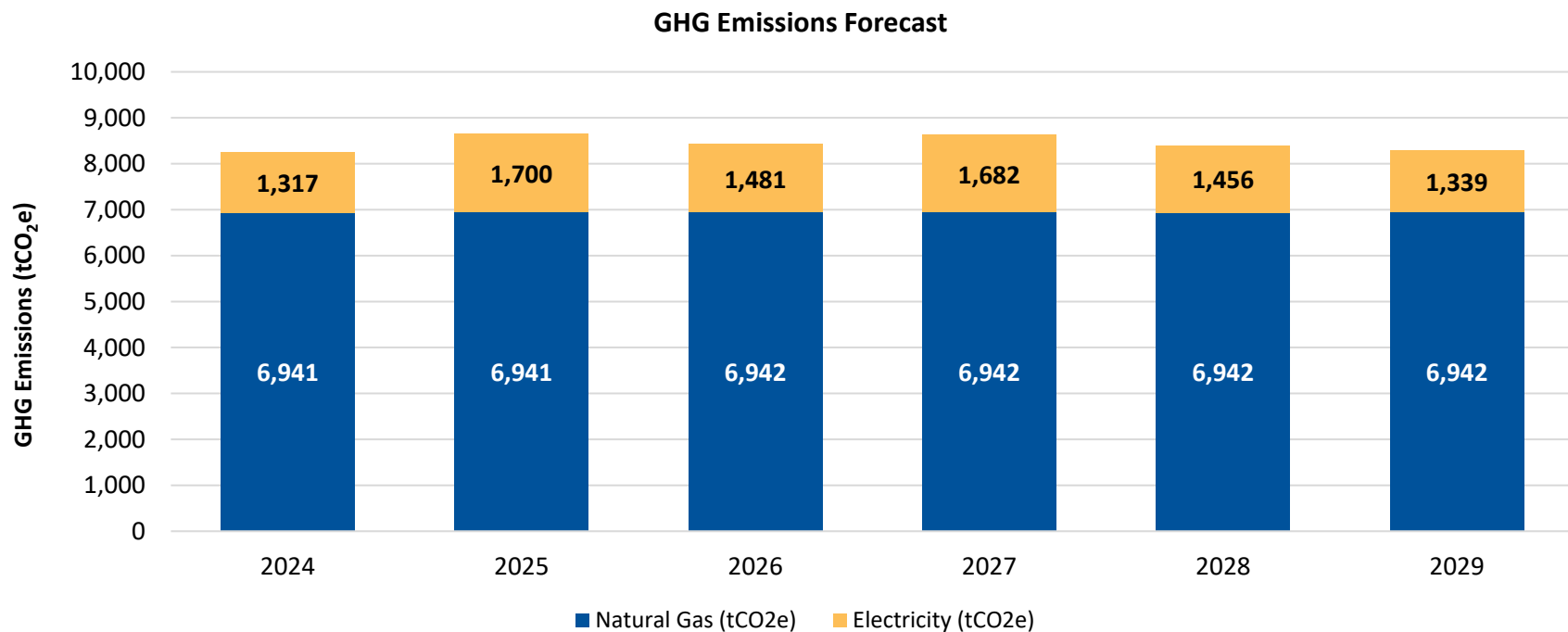


Figure 13. Forecast of Annual Greenhouse Gas Emissions for the Etobicoke General Hospital

5.3. Peel Memorial Centre



Picture 3. Peel Memorial Centre

The Peel Memorial Centre for Integrated Health and Wellness provides the residents of Brampton and the surrounding communities with new health facilities and easy access to a wide variety of traditional and alternative health care services. We opened an Urgent Care Centre in 2017 and are working on expanding. We strive to show the community how to take a more active role in managing their own health. In 2016, Peel Memorial Center was opened, with building systems that were designed to perform 26% better than ASHRAE 90.1-2010. The sustainable design and construction achieved a Leadership in Energy and Environmental Design (LEED®) Gold certification in 2017.

Facility Information	
Facility Name	Peel Memorial Centre
Type of Facility	Healthcare Services
Address	20 Lynch Street, Brampton, ON
Gross Area (Sq. Ft)	594,540
Average Operational Hours in a Week	168
Number of Floors	3

Table 18. Peel Memorial Centre Facility Information

5.3.1. Utility Consumption Analysis

Utilities to the site are electricity and natural gas. This site also utilizes a geothermal system that provide heating and cooling to the facility. The following table summarizes the accounts and consumption for each utility. Consumption for each respective utility has been normalized to a calendar year (365 days).

Utility	2019	2020	2021	2022	2023
Electricity (kWh)	8,762,748	8,512,955	8,254,691	8,455,763	8,499,753
Natural Gas (m ³)	544,507	706,022	626,666	423,573	336,309

Table 19. Historic Annual Utility Consumption for the Peel Memorial Centre

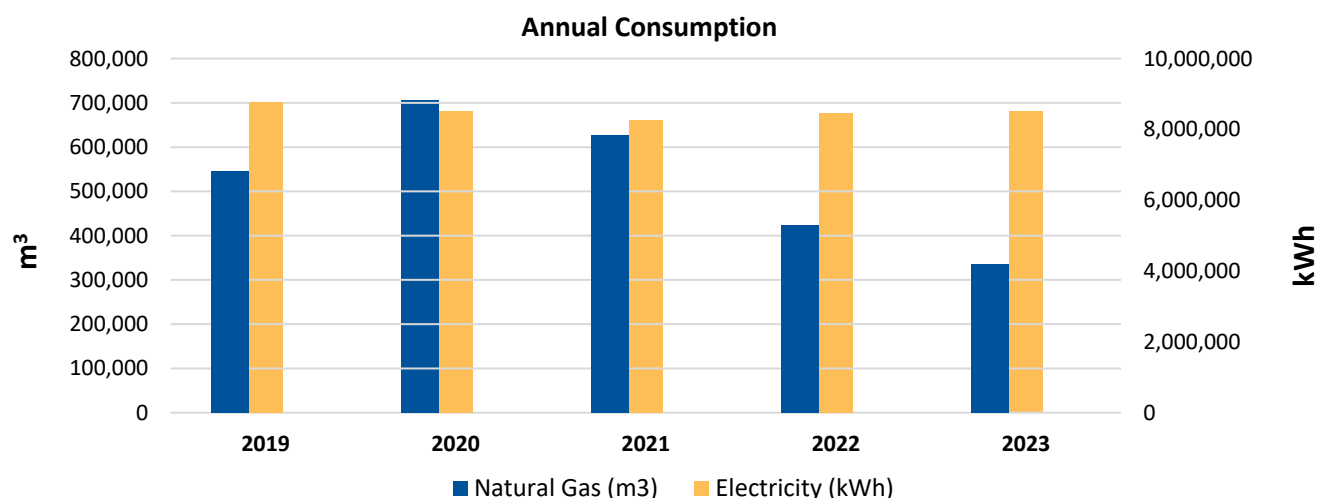


Figure 14. Historic Annual Utility Consumption for the Peel Memorial Centre

5.3.2. GHG Emissions Analysis

The greenhouse gas emissions are calculated based on the energy consumption data analyzed in the following table.

Utility Source (tCO ₂ e)	2019	2020	2021	2022	2023
Electricity (scope 2)	219	220	216	597	704
Natural Gas (scope 1)	1,046	1,356	1,204	814	646
Totals	1,265	1,576	1,420	1,411	1,350

Table 20. Historic Annual Greenhouse Gas Emissions for the Peel Memorial Centre

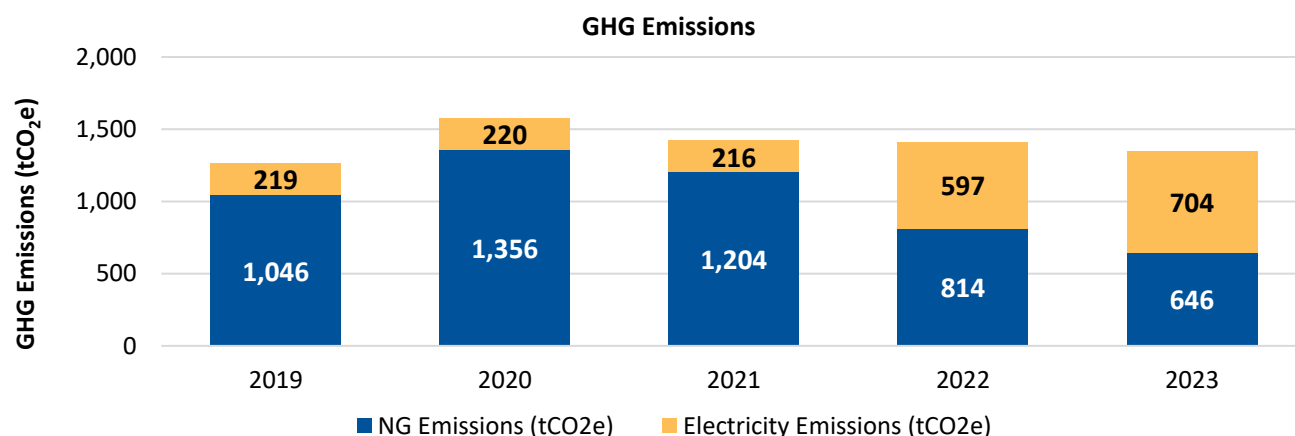


Figure 15. Historic Annual Greenhouse Gas Emissions for the Peel Memorial Centre

5.3.3. Proposed Conservation Measures

Due to the efficiency of this facility and state of the art design, energy efficiency gains are minimal. In partnership with the Facility Management Provider, Osler will be monitoring energy consumption on a monthly basis to ensure building systems are operating optimally.

There are currently no proposed measures.

Measure	Estimated Annual Savings			Project Cost	Simple Payback (Years)	Implementation Year
	Electricity (kWh)	Natural Gas (m ³)	Cost (\$)			
Optimize Base Building	TBD	TBD	TBD	TBD	TBD	TBD
Total	-	-	-	-	-	-

Table 21. Proposed Conservation Measures for the Peel Memorial Centre

5.3.4. Utility Consumption Forecast

The forecasted utility consumption is tabulated below. The percentage of change is based off the data from the baseline year of 2023.

Year	2024		2025		2026		2027		2028		2029	
	Units	% Change	Units	% Change	Units	% Change	Units	% Change	Units	% Change	Units	% Change
Natural Gas (m ³)	336,309	0%	336,309	0%	336,309	0%	336,309	0%	336,309	0%	336,309	0%
Electricity (kWh)	8,499,753	0%	8,499,753	0%	8,499,753	0%	8,499,753	0%	8,499,753	0%	8,499,753	0%

Table 22. Forecast of Annual Utility Consumption for the Peel Memorial Centre

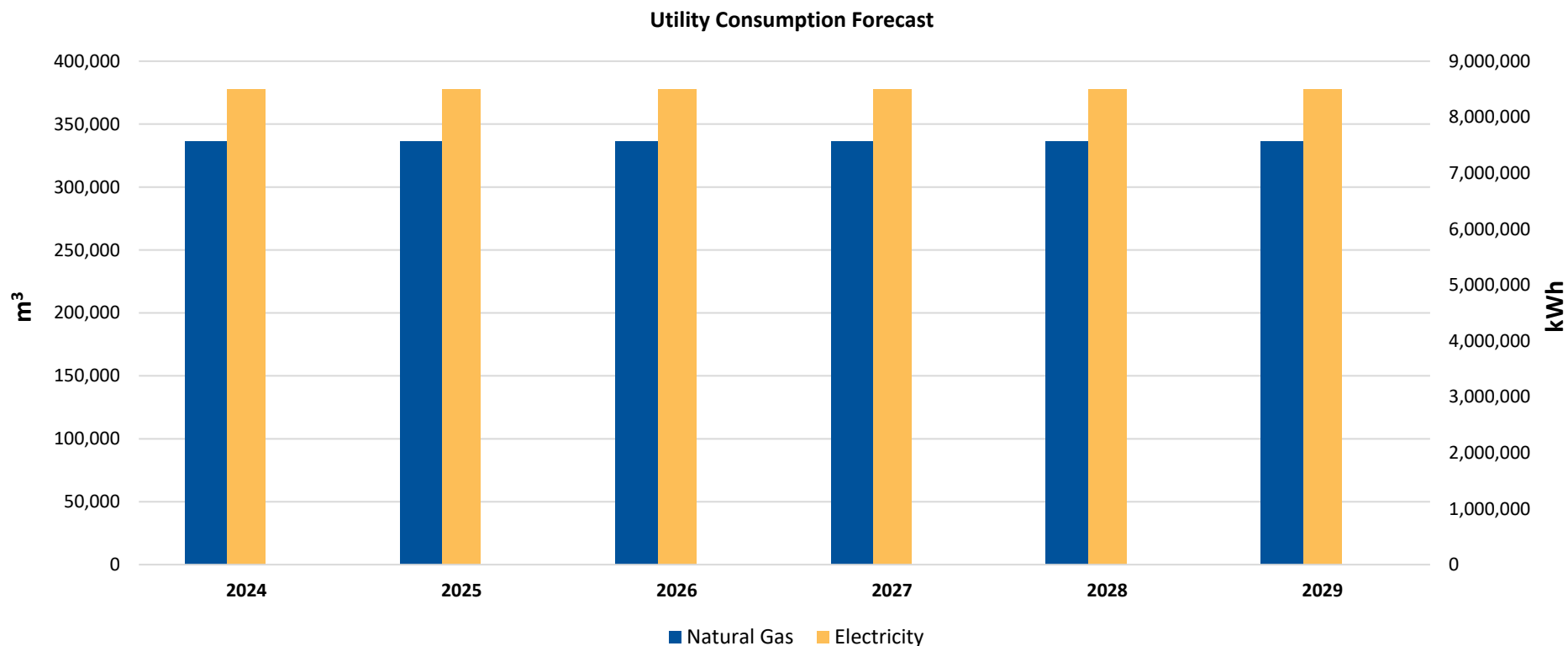


Figure 16. Forecast of Annual Utility Consumption for the Peel Memorial Centre

5.3.5. 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 2023.

Utility Source (tCO ₂ e)	2024	2025	2026	2027	2028	2029
Natural Gas (scope 1)	646	646	646	646	646	646
Electricity (scope 2)	557	746	652	740	641	589
Totals	1,203	1,392	1,298	1,386	1,287	1,235
Reduction from Baseline Year	11%	3%	4%	3%	5%	9%

Table 23. Forecast of Annual Greenhouse Gas Emissions for the Peel Memorial Centre

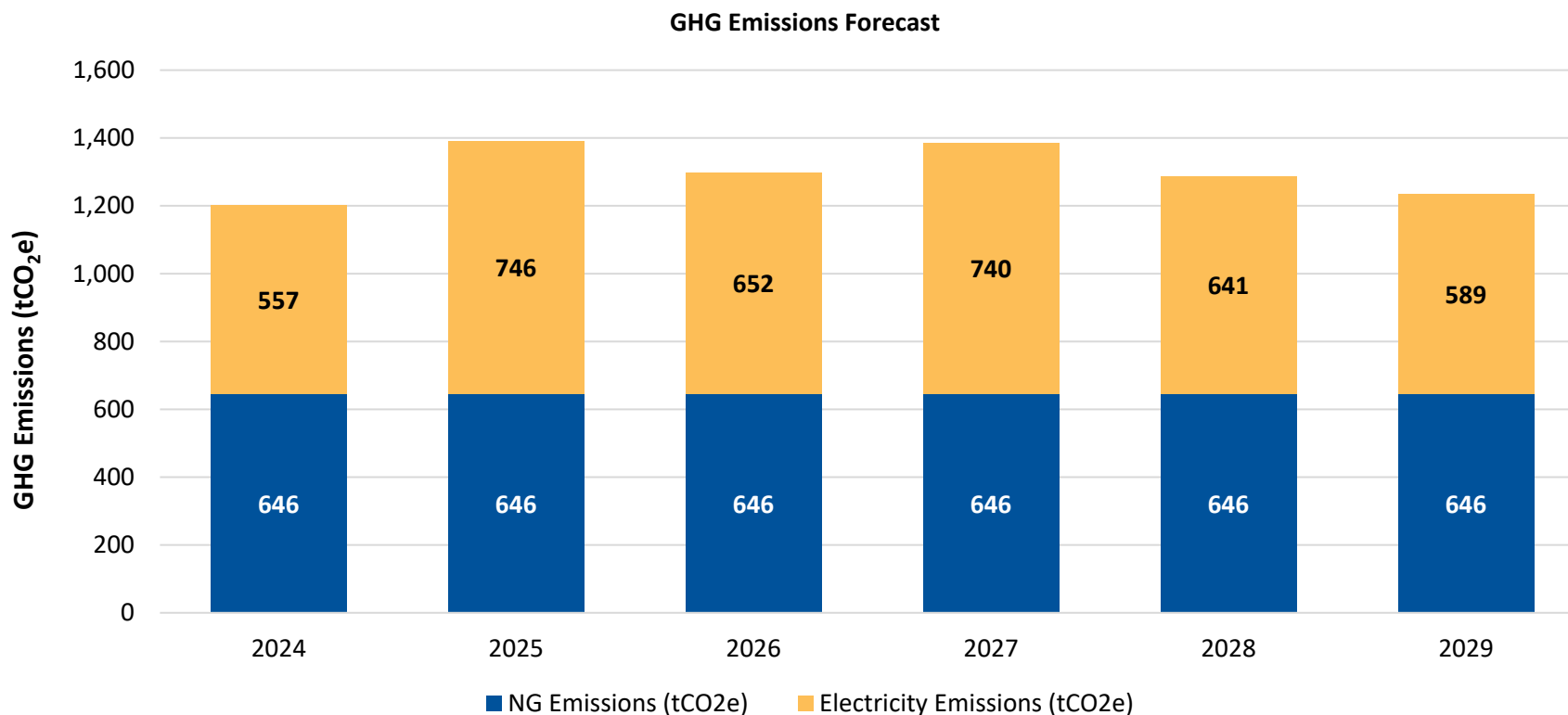


Figure 17. Forecast of Annual Greenhouse Gas Emissions for the Peel Memorial Centre

5.4. Withdrawal Management Centre



Picture 4. Withdrawal Management Centre

The Withdrawal Management Centre provides a non-medical, brief intervention for individuals 16 years of age and older who are intoxicated, in withdrawal, or in a crisis related to alcohol, drugs, and /or gambling.

Facility Information	
Facility Name	Withdrawal Management Centre
Type of Facility	Rehabilitation Services
Address	135 McLaughlin Road South, Brampton, ON
Gross Area (Sq. Ft)	11,670
Average Operational Hours in a Week	168
Number of Floors	1

Table 24. Withdrawal Management Centre Facility Information

5.4.1. 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 normalized to a calendar year (365 days).

Utility	2019	2020	2021	2022	2023
Electricity (kWh)	150,573	156,085	147,776	153,401	168,754
Natural Gas (m ³)	26,293	25,204	23,380	26,261	23,489

Table 25. Historic Annual Utility Consumption for the Withdrawal Management Centre

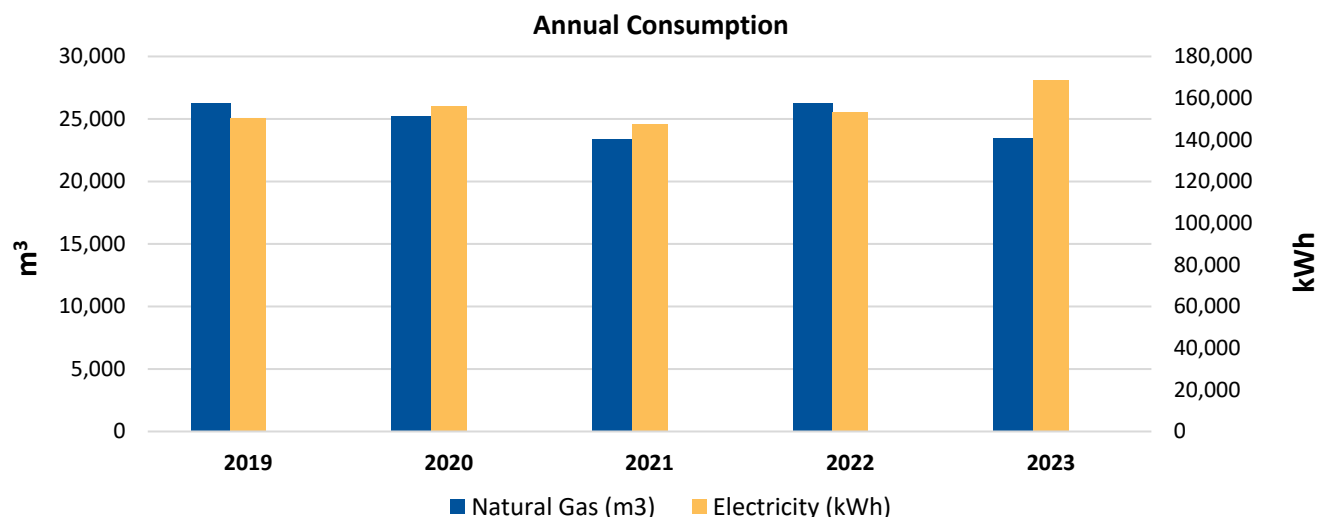


Figure 18. Historic Annual Utility Consumption for the Withdrawal Management Centre

5.4.2. GHG Emissions Analysis

The greenhouse gas emissions are calculated based on the energy consumption data analyzed in the following table.

Utility Source (tCO ₂ e)	2019	2020	2021	2022	2023
Electricity (scope 2)	4	4	4	11	14
Natural Gas (scope 1)	51	48	45	50	45
Totals	60	61	48	41	51

Table 26. Historic Annual Greenhouse Gas Emissions for the Withdrawal Management Centre

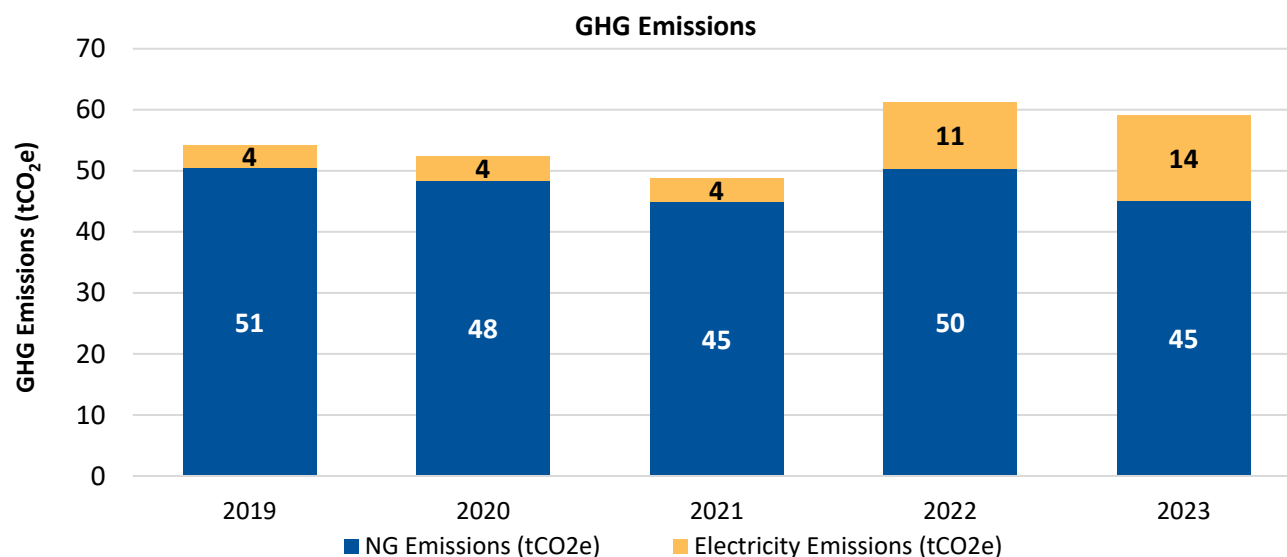


Figure 19. Historic Annual Greenhouse Gas Emissions for the Withdrawal Management Centre

5.4.1. Proposed Conservation Measures

In collaboration with the facility management team, a list of potential energy saving initiatives with anticipated project timelines has been created. Peel Memorial Centre'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	Estimated Annual Savings			Project Cost	Simple Payback (Years)	Implementation Year
	Electricity (kWh)	Natural Gas (m ³)	Cost (\$)			
Lighting scheduling optimization	68,832	0	\$10,500	\$15,250	1.5	2026
Total	68,832	0	\$10,500	\$15,250	1.5	-

Table 27. Proposed Conservation Measures for the Peel Memorial Centre

5.4.2. 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 2023.

	2024		2025		2026		2027		2028		2029	
	Units	% Change	Units	% Change	Units	% Change	Units	% Change	Units	% Change	Units	% Change
Natural Gas (m³)	23,489	0%	23,489	0%	23,489	0%	23,489	0%	23,489	0%	23,489	0%
Electricity (kWh)	168,754	0%	168,754	0%	99,922	41%	99,922	41%	99,922	41%	99,922	41%

Table 28. Forecast of Annual Utility Consumption for the Withdrawal Management Centre

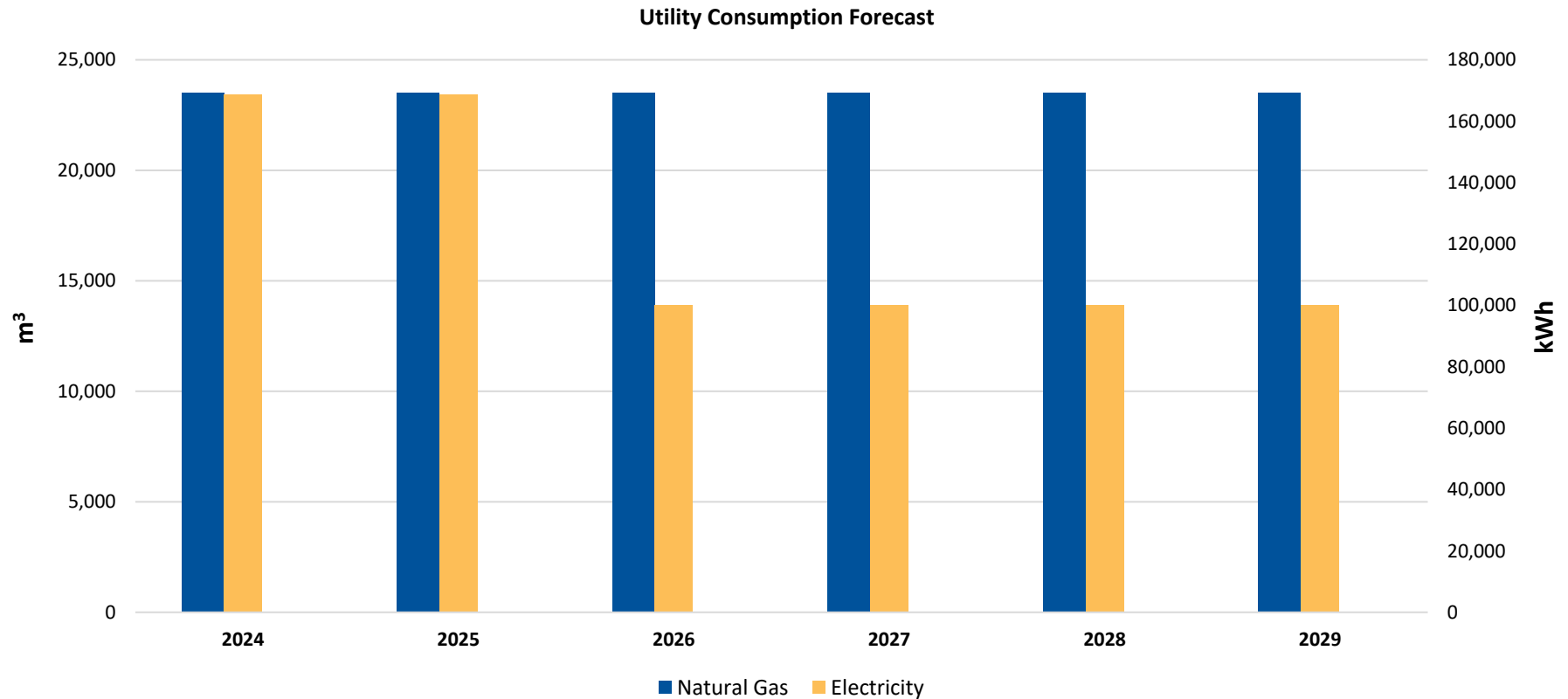


Figure 20. Forecast of Annual Utility Consumption for the Withdrawal Management Centre

5.4.3. 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 2023.

Utility Source (tCO ₂ e)	2024	2025	2026	2027	2028	2029
Natural Gas (scope 1)	45	45	45	45	45	45
Electricity (scope 2)	11	15	8	9	8	7
Totals	56	60	53	54	53	52
Reduction from Baseline Year	5%	1%	11%	9%	11%	12%

Table 29. Forecast of Annual Greenhouse Gas Emissions for the Withdrawal Management Centre

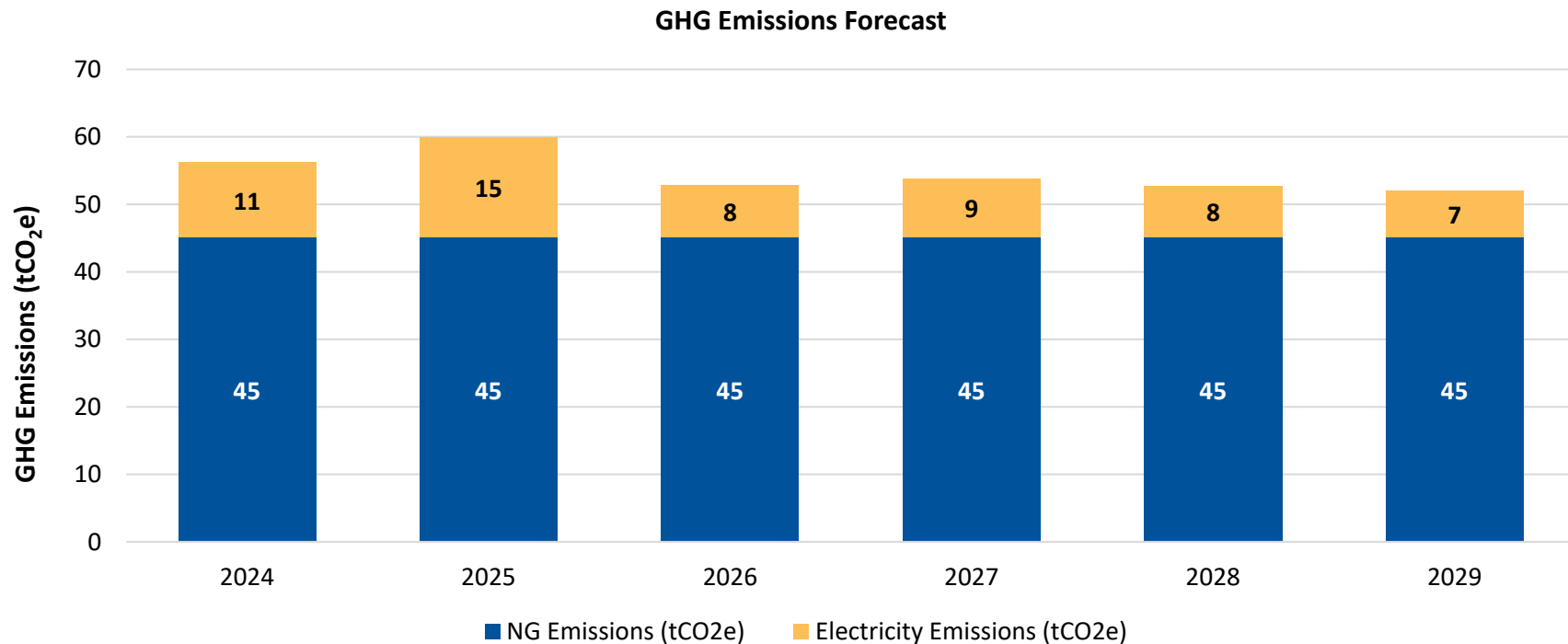


Figure 21. Forecast of Annual Greenhouse Gas Emissions for the Withdrawal Management Centre

6. Site-Wide Outlook

6.1. Site-Wide Utility Consumption Forecast

By implementing the energy conservation measures stated in the previous sections, in each respective site, Osler's site-wide 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 2023.

Fuel	2024		2025		2026		2027		2028		2029	
	Units	% Change	Units	% Change	Units	% Change	Units	% Change	Units	% Change	Units	% Change
Natural Gas (m ³)	9,944,854	0%	9,900,121	0%	9,609,086	3%	9,609,086	3%	9,609,086	3%	9,609,086	3%
Electricity (kWh)	64,854,813	0%	64,119,463	1%	63,012,361	3%	61,977,361	4%	61,977,361	4%	60,766,453	6%

Table 30. Forecast of Annual Utility Consumption for all Sites

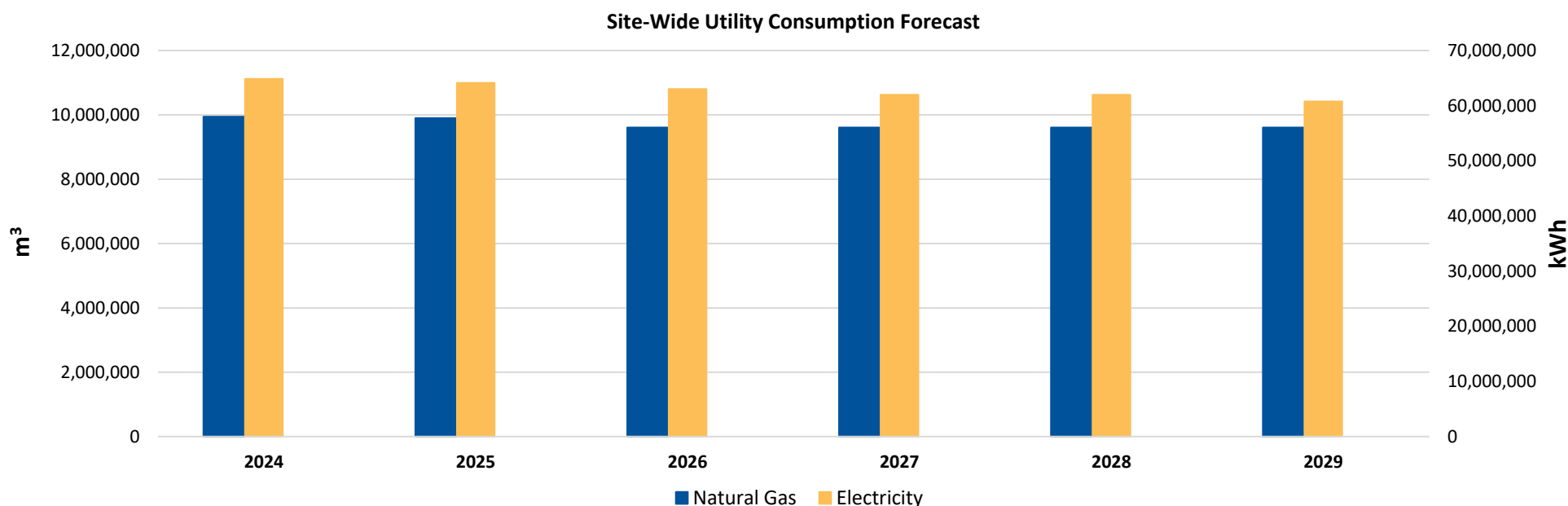


Figure 22. Forecast of Annual Utility Consumption for all Sites

6.2. Site-Wide GHG Emissions Forecast

The site-wide 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 2023.

Utility Source (tCO ₂ e)	2024	2025	2026	2027	2028	2029
Natural Gas (scope 1)	19,104	19,018	18,459	18,459	18,459	18,459
Electricity (scope 2)	4,248	5,630	4,833	5,398	4,673	4,211
Totals	23,352	24,648	23,292	23,857	23,132	22,670
Reduction from Baseline Year	5%	1%	5%	3%	5%	7%

Table 31. Forecast of Annual Greenhouse Gas Emissions for all Sites

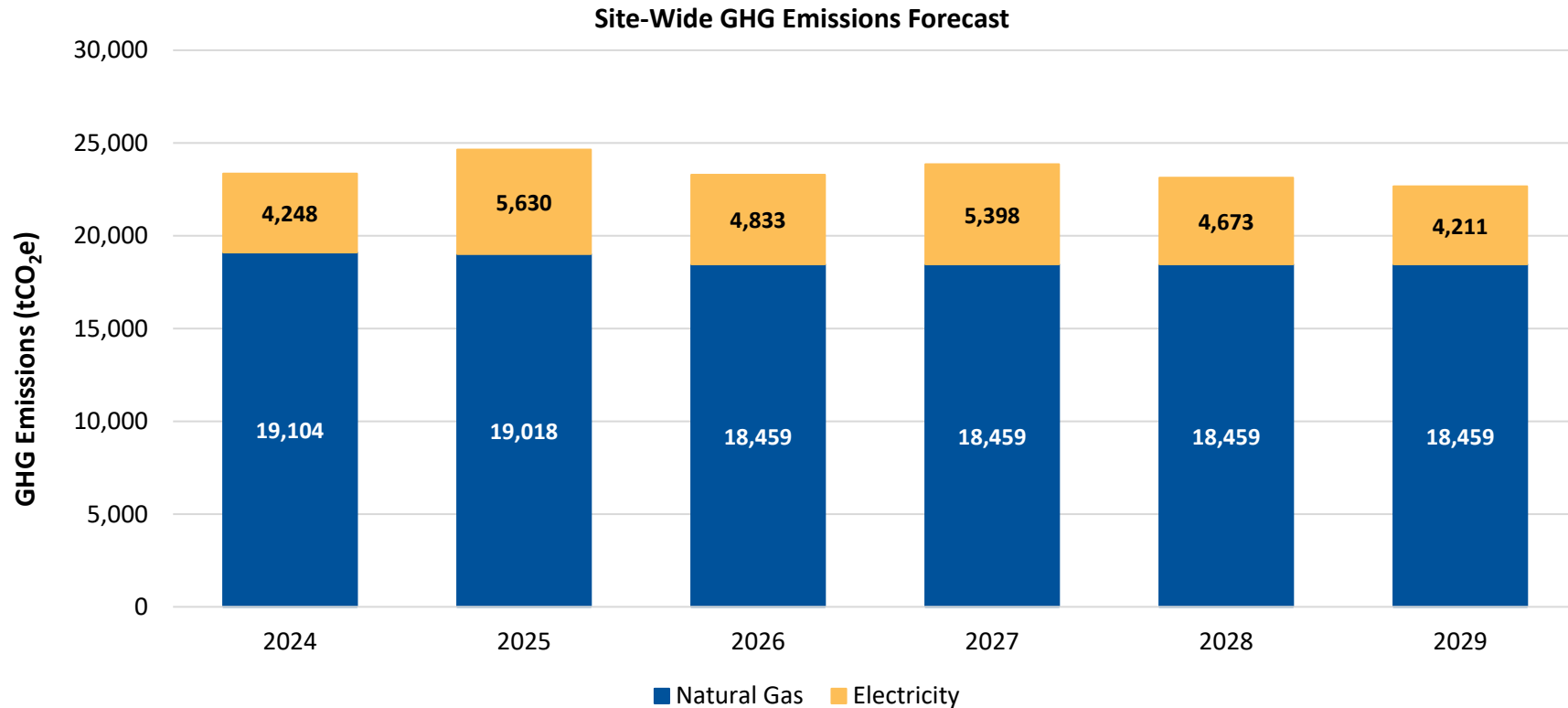



Figure 23. Forecast of Annual Greenhouse Gas Emissions for all Sites

7. Closing Comments

Thank you to all who contributed to William Osler Health System'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 William Osler Health System, we approve this Energy Conservation & Demand Management Plan.

X 

Scott Horn, MBA
AVP, Facilities Operations

This ECDM plan was created through a collaborative effort between William Osler Health System and Blackstone Energy Services.

8. Appendix

8.1. 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.
GHG Protocol		GHG Protocol refers to the recognized international standards used in the measurement and quantification of 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.

8.2. List of Pictures, Tables & Figures

Pictures

Picture 1. Brampton Civic Hospital	17
Picture 2. Etobicoke General Hospital	22
Picture 3. Peel Memorial Centre	27
Picture 4. Withdrawal Management Centre	32

Figures

Figure 1. Site-Wide Energy Consumption Trends & Projections	6
Figure 2. Osler Logo	9
Figure 3. Historic Annual Energy Utilization Indices for all Sites	12
Figure 4. Examples of Scope 1, 2, 3	13
Figure 5. Historic Greenhouse Gas Emissions for all Sites	14
Figure 6. Historic Annual Utility Consumption for the Brampton Civic Hospital	18
Figure 7. Historic Annual Greenhouse Gas Emissions for the Brampton Civic Hospital	18
Figure 8. Forecast of Annual Utility Consumption for the Brampton Civic Hospital	20
Figure 9. Forecast of Annual Greenhouse Gas Emissions for the Brampton Civic Hospital	21
Figure 10. Historic Annual Utility Consumption for the Etobicoke General Hospital	23
Figure 11. Historic Annual Greenhouse Gas Emissions for the Etobicoke General Hospital	23
Figure 12. Forecast of Annual Utility Consumption for the Etobicoke General Hospital	25
Figure 13. Forecast of Annual Greenhouse Gas Emissions for the Etobicoke General Hospital	26
Figure 14. Historic Annual Utility Consumption for the Peel Memorial Centre	28
Figure 15. Historic Annual Greenhouse Gas Emissions for the Peel Memorial Centre	28
Figure 16. Forecast of Annual Utility Consumption for the Peel Memorial Centre	30
Figure 17. Forecast of Annual Greenhouse Gas Emissions for the Peel Memorial Centre	31
Figure 18. Historic Annual Utility Consumption for the Withdrawal Management Centre	33
Figure 19. Historic Annual Greenhouse Gas Emissions for the Withdrawal Management Centre	33
Figure 20. Forecast of Annual Utility Consumption for the Withdrawal Management Centre	35
Figure 21. Forecast of Annual Greenhouse Gas Emissions for the Withdrawal Management Centre	36
Figure 22. Forecast of Annual Utility Consumption for all Sites	37
Figure 23. Forecast of Annual Greenhouse Gas Emissions for all Sites	38

Tables

Table 1. Site-Wide Energy Consumption Trends & Projections	7
Table 2. Historic Energy Utilization Indices for all Sites	12
Table 3. GHG Emission Factors	13
Table 4. Historic Greenhouse Gas Emissions for all Sites	14
Table 5. Completed Conservation Measures.....	16
Table 6. Brampton Civic Hospital Facility Information	17
Table 7. Historic Annual Utility Consumption for the Brampton Civic Hospital	18
Table 8. Historic Annual Greenhouse Gas Emissions for the Brampton Civic Hospital	18
Table 9. Proposed Conservation Measures for the Brampton Civic Hospital	19
Table 10. Forecast of Annual Utility Consumption for the Brampton Civic Hospital	20
Table 11. Forecast of Annual Greenhouse Gas Emissions for the Brampton Civic Hospital	21
Table 12. Etobicoke General Hospital Facility Information	22
Table 13. Historic Annual Utility Consumption for the Etobicoke General Hospital	23
Table 14. Historic Annual Greenhouse Gas Emissions for the Etobicoke General Hospital	23
Table 15. Proposed Conservation Measures for the Etobicoke General Hospital	24
Table 16. Forecast of Annual Utility Consumption for the Etobicoke General Hospital	25
Table 17. Forecast of Annual Greenhouse Gas Emissions for the Etobicoke General Hospital	26
Table 18. Peel Memorial Centre Facility Information.....	27
Table 19. Historic Annual Utility Consumption for the Peel Memorial Centre	28
Table 20. Historic Annual Greenhouse Gas Emissions for the Peel Memorial Centre	28
Table 21. Proposed Conservation Measures for the Peel Memorial Centre.....	29
Table 22. Forecast of Annual Utility Consumption for the Peel Memorial Centre.....	30
Table 23. Forecast of Annual Greenhouse Gas Emissions for the Peel Memorial Centre.....	31
Table 24. Withdrawal Management Centre Facility Information.....	32
Table 25. Historic Annual Utility Consumption for the Withdrawal Management Centre	33
Table 26. Historic Annual Greenhouse Gas Emissions for the Withdrawal Management Centre	33
Table 27. Proposed Conservation Measures for the Peel Memorial Centre.....	34
Table 28. Forecast of Annual Utility Consumption for the Withdrawal Management Centre.....	35
Table 29. Forecast of Annual Greenhouse Gas Emissions for the Withdrawal Management Centre.....	36
Table 30. Forecast of Annual Utility Consumption for all Sites	37
Table 31. Forecast of Annual Greenhouse Gas Emissions for all Sites	38