FANSHAWE

Energy Conservation and Demand Management Plan

2024-2029

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1. Regulatory Update

O. Reg. 397/11: Conservation and Demand Management Plans was introduced in 2013, under which public agencies were required to report on energy consumption and greenhouse gas (GHG) emissions and develop Conservation and Demand Management (CDM) 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 The Bill repealed the GEA and all its underlying Regulations, including O. Reg. 397/11.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.

Thus, the conservation and energy efficiency initiatives, namely CDM plans and broader public sector energy reporting were re-introduced as amendments to the Electricity Act. The new regulation is now called **O. Reg. 507/18: Broader Public Sector: Energy Conservation and Demand Management Plans (ECDM).**

As of January 1, 2019, O. Reg. 397/11 was replaced by O. Reg. 507/18, and BPS reporting and ECDM plans are under the Electricity Act, 1998 rather than the Green Energy Act, 2009.

As of February 23, 2023, O. Reg. 507/18 was replaced **by O. Reg. 25/23, and BPS reporting and ECDM Plans** are under the Electricity Act, 1998 rather than the Green Energy Act, 2009.

2. Executive Summary

The purpose of Fanshawe College's Energy Conservation and Demand Management (ECDM) Plan is to outline actions, measures and results of past and future conservation measures which have and will continue to promote good stewardship of our environment and community resources. In keeping with Fanshawe College's core values of utilizing resources wisely and embracing change, this ECDM outlines how the college will reduce overall energy consumption, operating costs and greenhouse gas emissions. This ECDM Plan is written in accordance with O. Reg. 25/23 of the recently amended Electricity Act, 1998.

Through past conservation and demand initiatives, Fanshawe College has achieved the following results since 2019:

- 635,928kwh reduction in electricity use
- 325,747m3 reduction in natural gas use

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

- Fanshawe College's Energy Use Index (EUI) was 19.53 ekWh/sq. ft.
- Energy-related emissions equaled 6,705 tCO_2e.

To obtain full value from energy management activities, Fanshawe College 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, Fanshawe College can expect to achieve the following targets by 2029, in comparison to the 2023 baseline year:

- 29% reduction in electricity consumption
- 8% reduction in natural gas consumption
- 27% reduction in carbon equivalent emissions

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

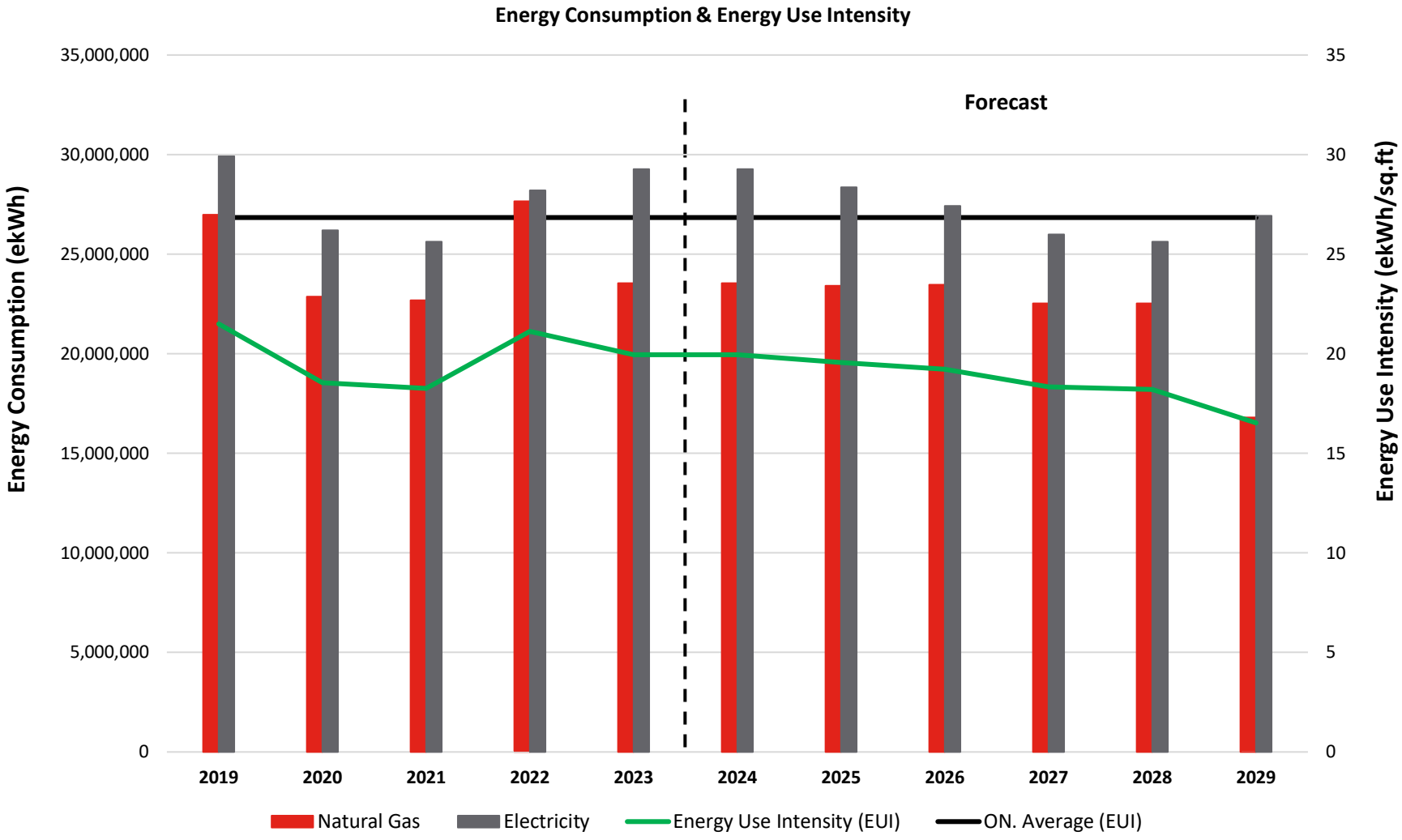


Figure 1. *Campus-Wide Energy Consumption Trends & Projections for Fanshawe College*

3. About Fanshawe College

Picture 1. *Fanshawe College*

Serving the communities of Ontario by providing flexible learning arrangements and experiential education opportunities, Fanshawe College is a network of locations, facilities and programs. With more than 200 career-focused programs, Fanshawe serves almost 23,000 full-time and part-time students across four counties throughout southern Ontario. Fanshawe is committed to practicing, promoting and pursuing environmental sustainability by complying with all applicable laws and requirements, conserving natural resources and preventing pollution, and continuous improvement to maintain the highest environmental standards and practices.

With campuses across London, Simcoe, St. Thomas and Woodstock, Fanshawe is one of Ontario's largest colleges. With a commitment to educate, engage, empower and excite, Fanshawe serves a community of close to half a million people. We offer more than 200 degrees, diploma, certificate and apprenticeship programs, helping people unlock their potential in a variety of disciplines.

Our Vision

Unlocking Potential.

Our Mission

Provide pathways to success, an exceptional learning experience and a global outlook to meet student and employer needs.

Our Values

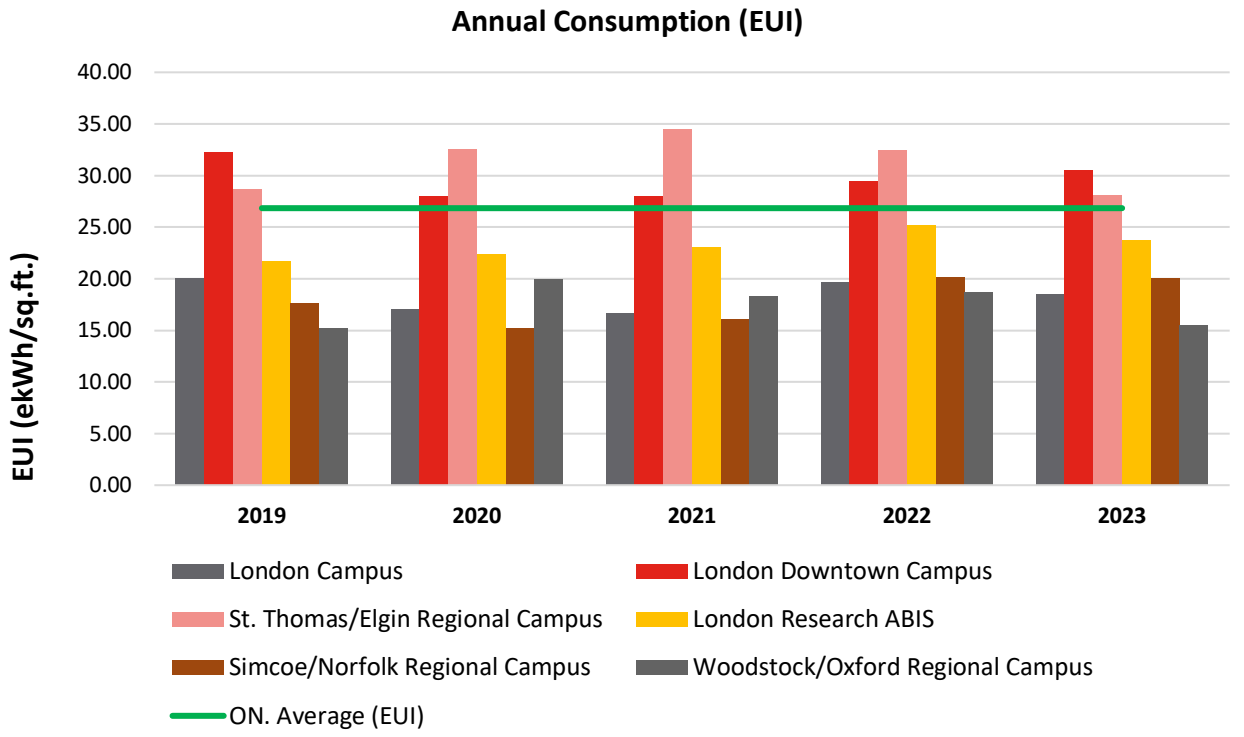
Focus on students, involve our communities, utilize resources wisely, embrace change, engage each other.

3.1. Campus-Wide Historical Energy Intensity

The Energy Utilization Index is a measure of how much energy a facility uses per square foot. Breaking down a facility's energy consumption on a per-square-foot-basis allows facilities of different sizes to be compared with ease. In this case, we are comparing our facility to the industry average for Ontario colleges* which was found to be 27.63 ekWh/Sq. Ft.

Campus	2019	2020	2021	2022	2023
London Campus	20.09	17.01	16.65	19.67	18.45
London Downtown Campus	32.20	28.00	27.97	29.45	30.56
London Research ABIS	21.74	22.39	23.02	25.21	23.69
St. Thomas/Elgin Regional Campus	28.71	32.51	34.47	32.46	28.14
Simcoe/Norfolk Regional Campus	17.63	15.17	16.09	20.14	19.97
Woodstock/Oxford Regional Campus	15.22	19.96	18.32	18.68	15.51
Total	**21.04**	**18.14**	**17.86**	**20.66**	**19.53**

Table 1. *Historic Energy Utilization Indices for All Fanshawe Campuses*



**Derived from Natural Resources Canada's Commercial and Institutional Consumption of Energy Survey*

Figure 2. *Historic Annual Energy Utilization Indices for All Fanshawe Campuses*

3.2. Campus-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 – hydroelectricity produces fewer greenhouse gases than coal-fired plants, or 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 and 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 tons 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 represents the indirect emissions from the consumption of purchased energy generated upstream from the institution.

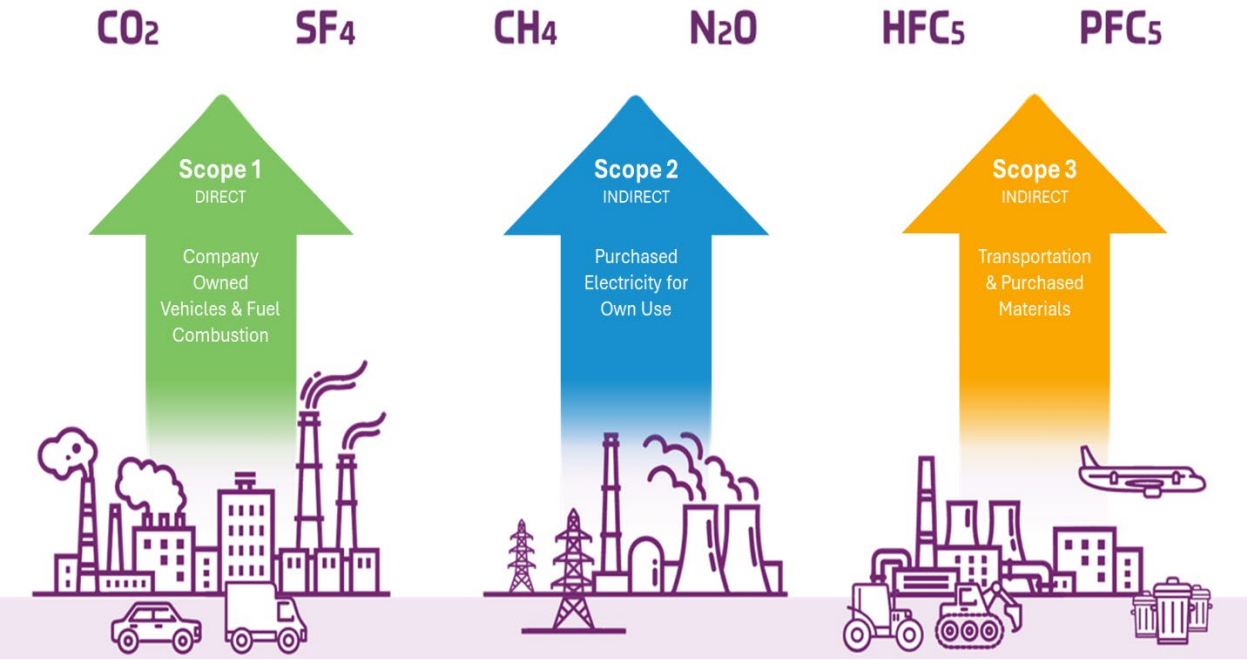


Figure 3. *Examples of Scope 1 and 2*

Please see below historic emissions factors used to calculate GHG emissions. As highlighted in the table below, there is a significant increase in 2022 and 2023 on the electricity side. This is due in part to Ontario adding natural gas to the energy mix to meet peak demands. This results in an increase in GHG contribution for those years.

Emission Factors	2019	2020	2021	2022	2023
Natural Gas (tCO_2e/m^3)	0.001921	0.001921	0.001921	0.001921	0.001921
Electricity (tCO_2e/kWh)	0.000025	0.000026	0.000026	0.000071	0.000083

Table 2. *Historic GHG Emissions Factors*

GHG Emissions	2019	2020	2021	2022	2023
Scope 1 (Natural Gas)	4,906	4,159	4,127	5,031	4,280
Scope 2 (Electricity)	748	676	671	1,992	2,424
Total Scope 1 & 2 Emissions	**5,654**	**4,835**	**4,798**	**7,023**	**6,705**

Table 3. *Historic Greenhouse Gas Emissions for All Fanshawe Campuses*

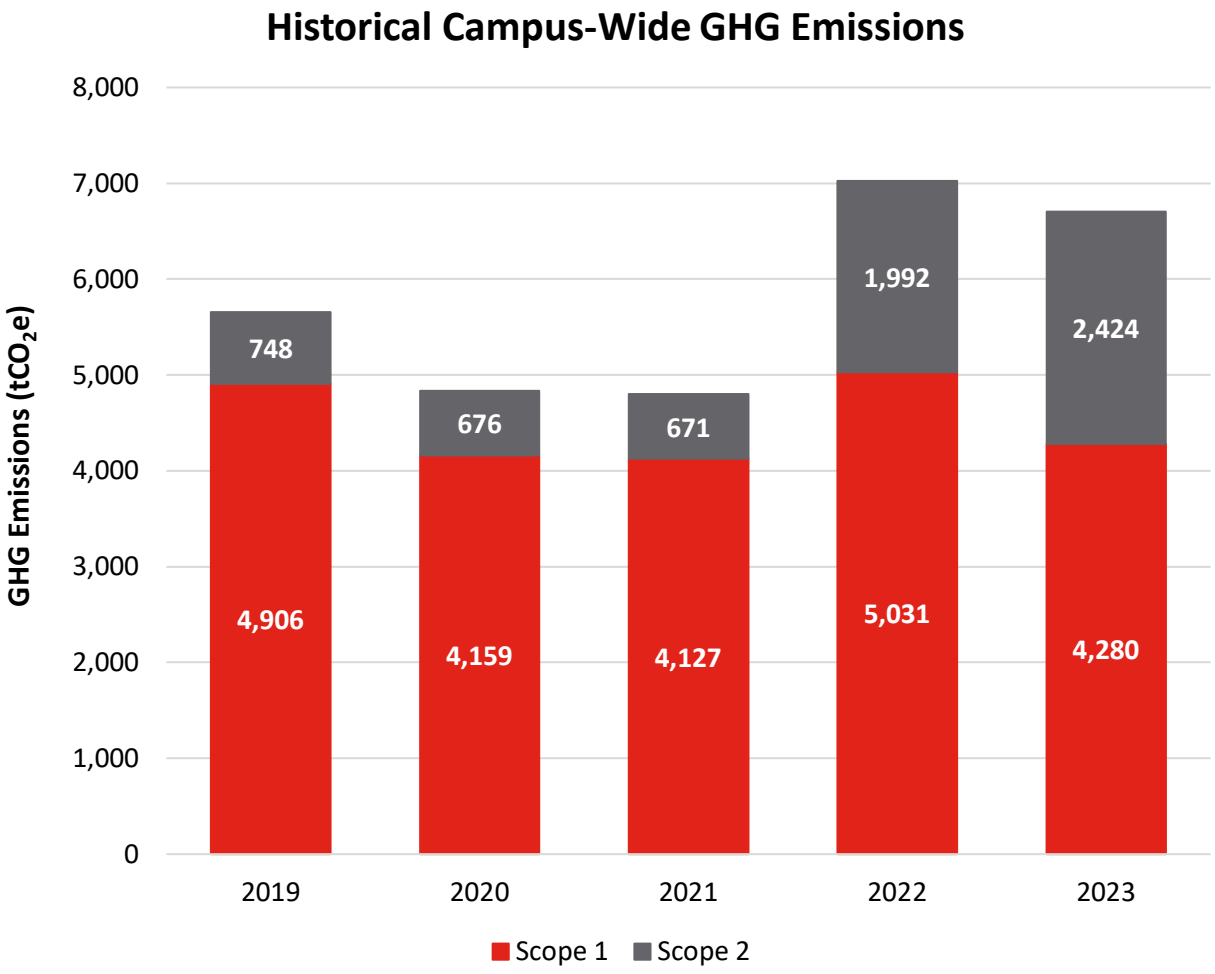


Figure 4. *Historic Greenhouse Gas Emissions for All Fanshawe Campuses*

3.3. Conservation Strategies to Date

Over the previous years, Fanshawe College has undertaken various energy conservation and demand management measures and sustainability initiatives. The summary of the main activities is shown in the table below.

Measure	Results
Match Load – Retro Commissioning and Controls, Energy Management Information System, Employee Awareness and Outreach, Water Conservation	Fanshawe College continuously reviews and upgrades their facilities and is committed to energy conservation and demand management. These measures have resulted in more energy efficient and reliable operations, reductions in GHG emissions and reductions in energy use. The measures have resulted in a 949,000kwh reduction in electricity use and 325,747m3 reduction in natural gas use.
Reduce Load - Building Enveloping, Electrical, HVAC, Lighting, Mechanical, General Contractors, Maintenance Architecture, Maintenance Mechanical, New Building	
Energy Transfer - Renewable Energy Heating and Cooling Plant Optimization	
Cost Control	
Space Optimization	
Facility/Fleet Electrification	
Renewable Energy	
Campus as a Living Lab	
Emissions Management	
Waste Reduction	
GHG reduction Opportunities	
Recycling	
Interactive Ideas	

Table 4. *Conservation Strategies to Date*

4. 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.

4.1. London Campus

Picture 2. *Fanshawe College London Campus*

London Ontario is recognized in Canada and around the world as a centre for education and innovative research and is home to the College's main campus. Located on a 100-acre property it is a prominent London landmark. This campus features state-of -the-art learning facilities, a dozen cafeterias and restaurants, student residences, sports facilities, fitness centre, bookstore/computer store, and more. Included in the reporting is the London Campus, London Downtown Campus, and London Research Campus. Please see Appendix 1: Facility Information for a list of included buildings.

London Campuses Facility Information	
Facility Name	Fanshawe College London Campus London Downtown Campus London Research Campus
Address	Please see Appendix 1: Facility Information for a list of all included addresses
Gross Area (Sq. Ft)	London Campus: 2,372,040 London Downtown Campus: 187,186 London Research Campus: 35,575
Facility Use	Post-Secondary Education Institution

Table 5. *London Campus Facility Information*

4.1.1. Utility Data

Utilities to the site are electricity, natural gas and water. The following table summarizes the accounts for each utility. Utility consumption for each respective utility has been adjusted to fit a regular calendar year (365 days).

Natural Gas (m3)	2019	2020	2021	2022	2023
London Campus	2,088,698	1,731,560	1,727,111	2,167,216	1,809,368
London Downtown Campus	324,720	278,238	256,657	275,591	275,177
London Research ABIS	31,569	37,079	38,428	46,010	40,143
Total	**2,444,987**	**2,046,877**	**2,022,196**	**2,488,817**	**2,124,688**

Table 6. *Historic Annual Natural Gas Consumption for the London Campus*

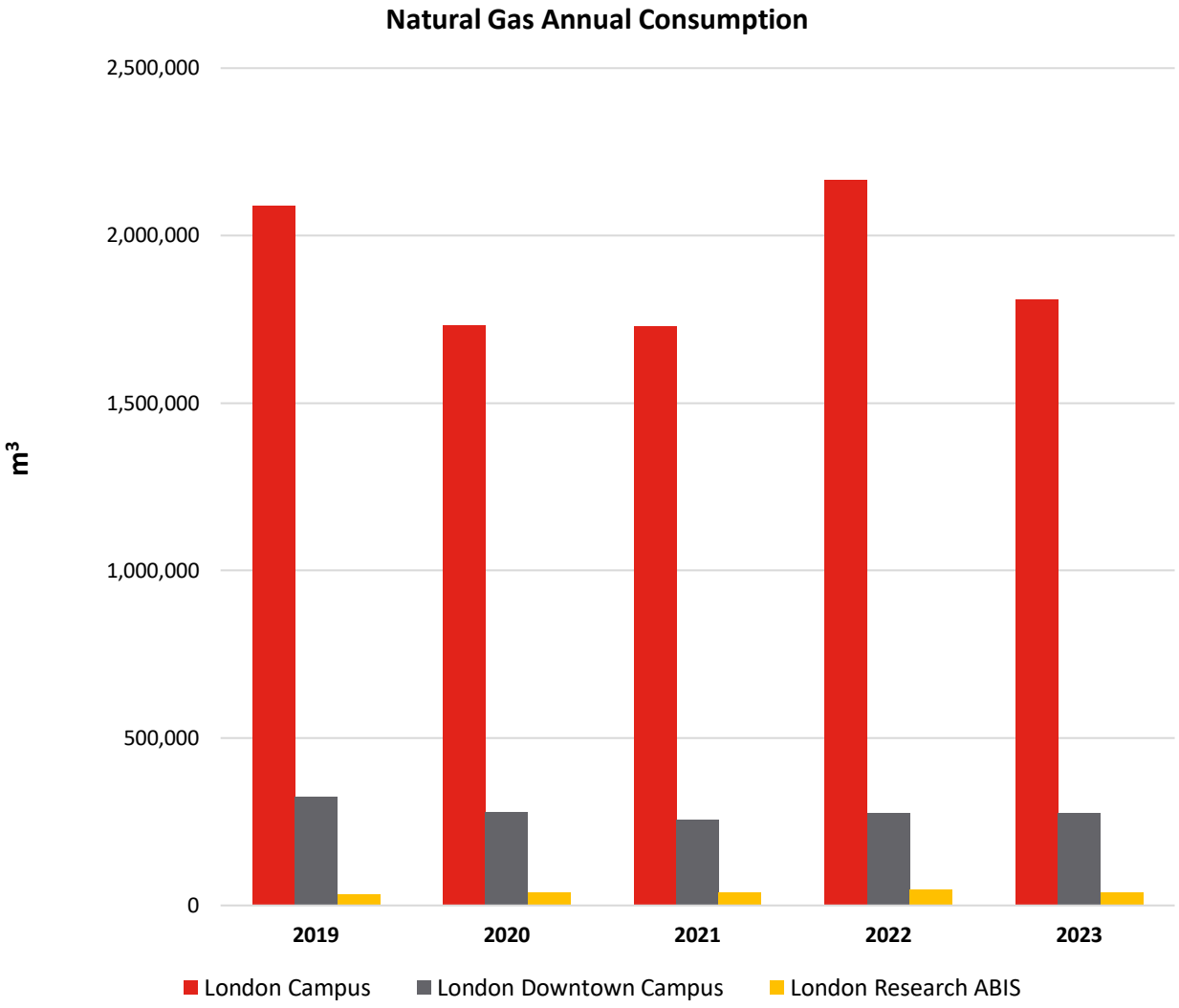


Figure 5. *Historic Annual Natural Gas Consumption for the London Campus*

Electricity (kWh)	2019	2020	2021	2022	2023
London Campus	25,590,000	22,056,000	21,247,000	23,768,000	24,648,000
London Downtown Campus	2,599,000	2,303,000	2,526,000	2,603,000	2,815,000
London Research ABIS	440,000	405,000	413,000	411,000	419,000
Totals	**28,629,000**	**24,764,000**	**24,186,000**	**26,782,000**	**27,882,000**

Table 7. *Historic Annual Electricity Consumption for the London Campus*

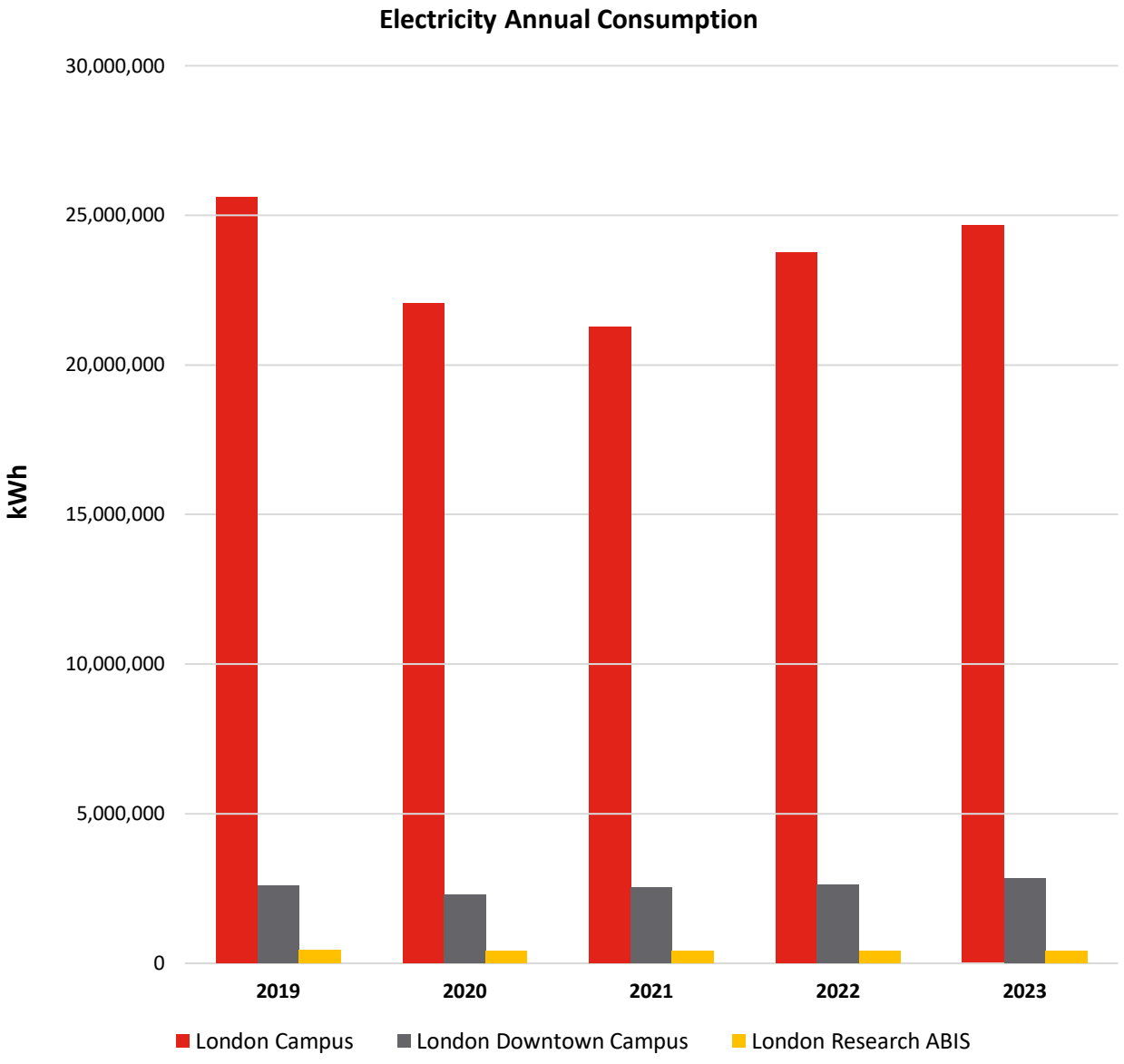


Figure 6*. Historic Annual Electricity Consumption for the London Campus*

4.1.2. GHG Emissions

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

Natural Gas (Scope 1 tCO2e)	2019	2020	2021	2022	2023
London Campus	4,012	3,326	3,318	4,163	3,476
London Downtown Campus	624	534	493	529	529
London Research ABIS	61	71	74	88	77
Totals	**4,697**	**3,931**	**3,885**	**4,780**	**4,082**

Table 8. *Historic Annual Natural Gas GHG Emissions for the London Campus*

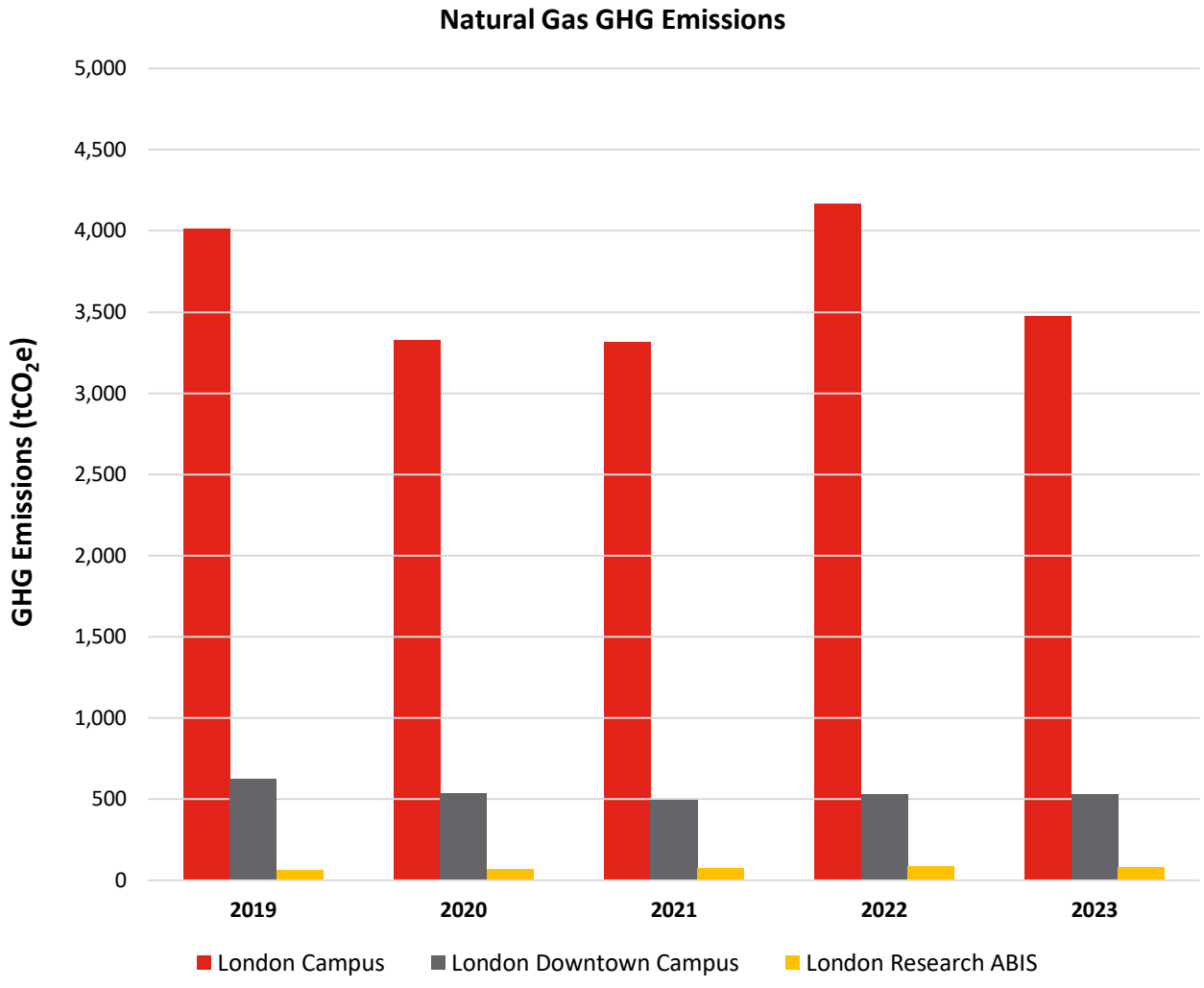


Figure 7. *Historic Annual Natural Gas GHG Emissions for the London Campus*

Electricity (scope 2 tCO2e)	2019	2020	2021	2022	2023
London Campus	640	569	557	1,678	2,041
London Downtown Campus	65	59	66	184	233
London Research ABIS	11	10	11	29	35
Totals	**716**	**638**	**634**	**1,891**	**2,309**

Table 9*. Historic Annual Electricity GHG Emissions for the London Campus*

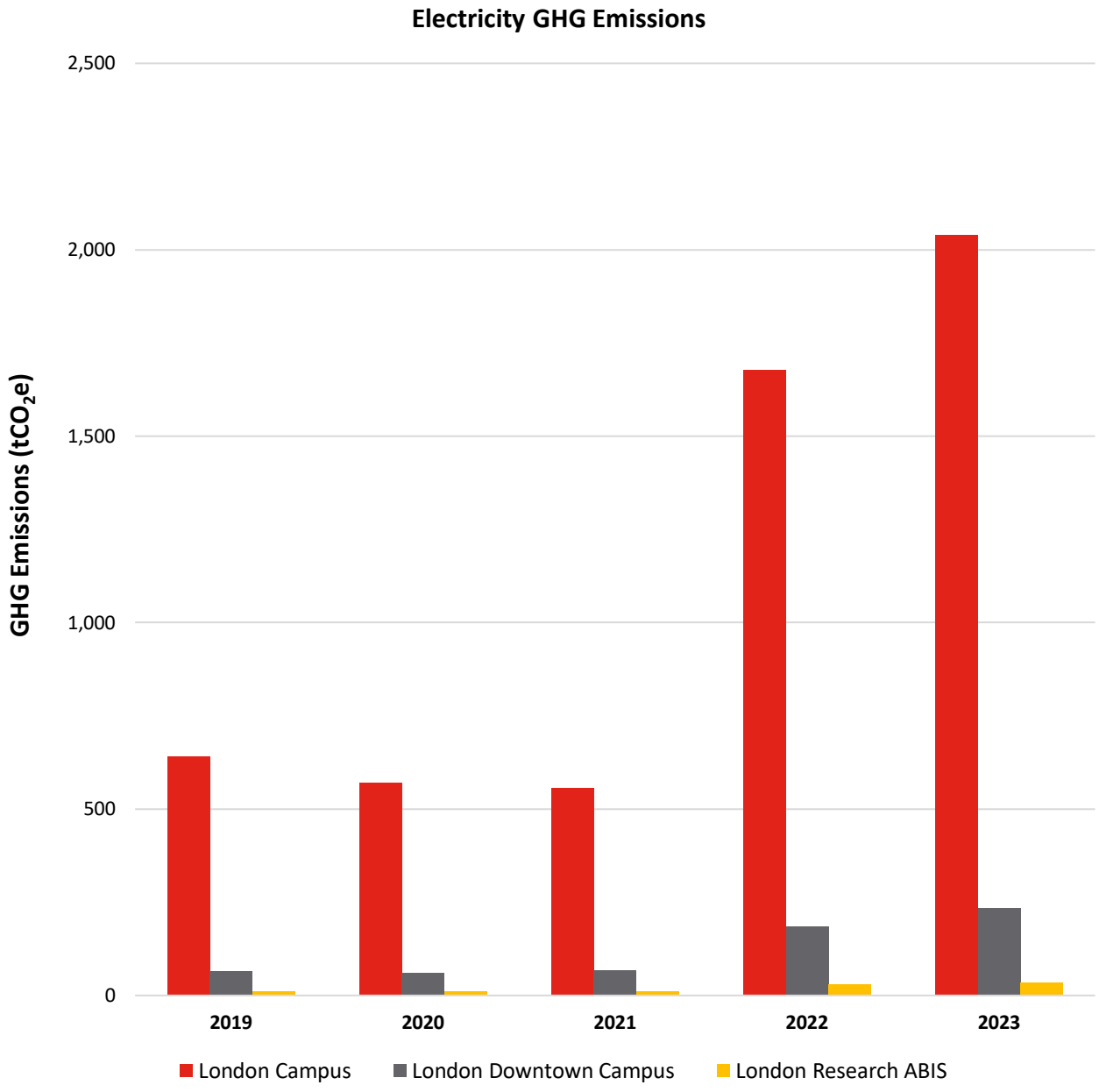


Figure 8. *Historic Annual Electricity GHG Emissions for the London Campus*

4.1.3. Proposed Conservation Measures

The energy analysis has revealed several conservation strategies for the facility. London Campus' proposed energy and water saving initiatives are summarized in the table below outlining the targeted utilities. These measures will remain in place until another, more efficient and cost-effective technology is found.

Measure	Estimated Annual Savings			Project Cost	Implementation Year
	Electricity (kWh)	Natural Gas (m^3)	Cost ($)		
CEC Plant - centralized chillers (3,000Ton) on VFD	869,944	0	$113,093	$21,616,629	2025
Lighting Retrofit	924,300	-4,376	$118,474	$11,234,051	2026
BAS Recommissioning	1,448,590	88,185	$222,268	$1,050,000	2027
L Building Rooftop Solar 50 kW	61,430	0	$7,986	$125,000	2028
Geothermal heat pump (1,200Ton)	-1,310,189	542,810	$38,657	$40,000,000	2029
Total	**1,994,075**	**626,619**	**$500,478**	**$74,025,680**	**-**

Table 10. *Targeted Utilities and Proposed Conservation Measures for the London Campus*

4.1.4. Utility Consumption Forecast

From 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 on the data from the baseline year of 2023.**

Natural Gas (m3)	2023 (baseline)	2024	2025	2026	2027	2028	2029
London Campus	1,809,368	1,809,368	1,809,368	1,813,744	1,725,559	1,725,559	1,182,749
London Downtown Campus	275,177	275,177	275,177	275,177	275,177	275,177	275,177
London Research ABIS	40,143	40,143	40,143	40,143	40,143	40,143	40,143
Total	**2,124,688**	**2,124,688**	**2,124,688**	**2,129,064**	**2,040,879**	**2,040,879**	**1,498,069**
Reduction from Baseline (2023)		**0%**	**0%**	**0%**	**4%**	**4%**	**29%**

Electricity (kWh)	2023 (baseline)	2024	2025	2026	2027	2028	2029
London Campus	24,648,000	24,648,000	23,778,056	22,853,756	21,405,166	21,343,736	22,653,925
London Downtown Campus	2,815,000	2,815,000	2,815,000	2,815,000	2,815,000	2,815,000	2,815,000
London Research ABIS	419,000	419,000	419,000	419,000	419,000	419,000	419,000
Total	**27,882,000**	**27,882,000**	**27,012,056**	**26,087,756**	**24,639,166**	**24,577,736**	**25,887,925**
Reduction from Baseline (2023)		**0%**	**3%**	**6%**	**12%**	**12%**	**7%**

***Table 11**. Forecast of Annual Utility Consumption for the London Campus*

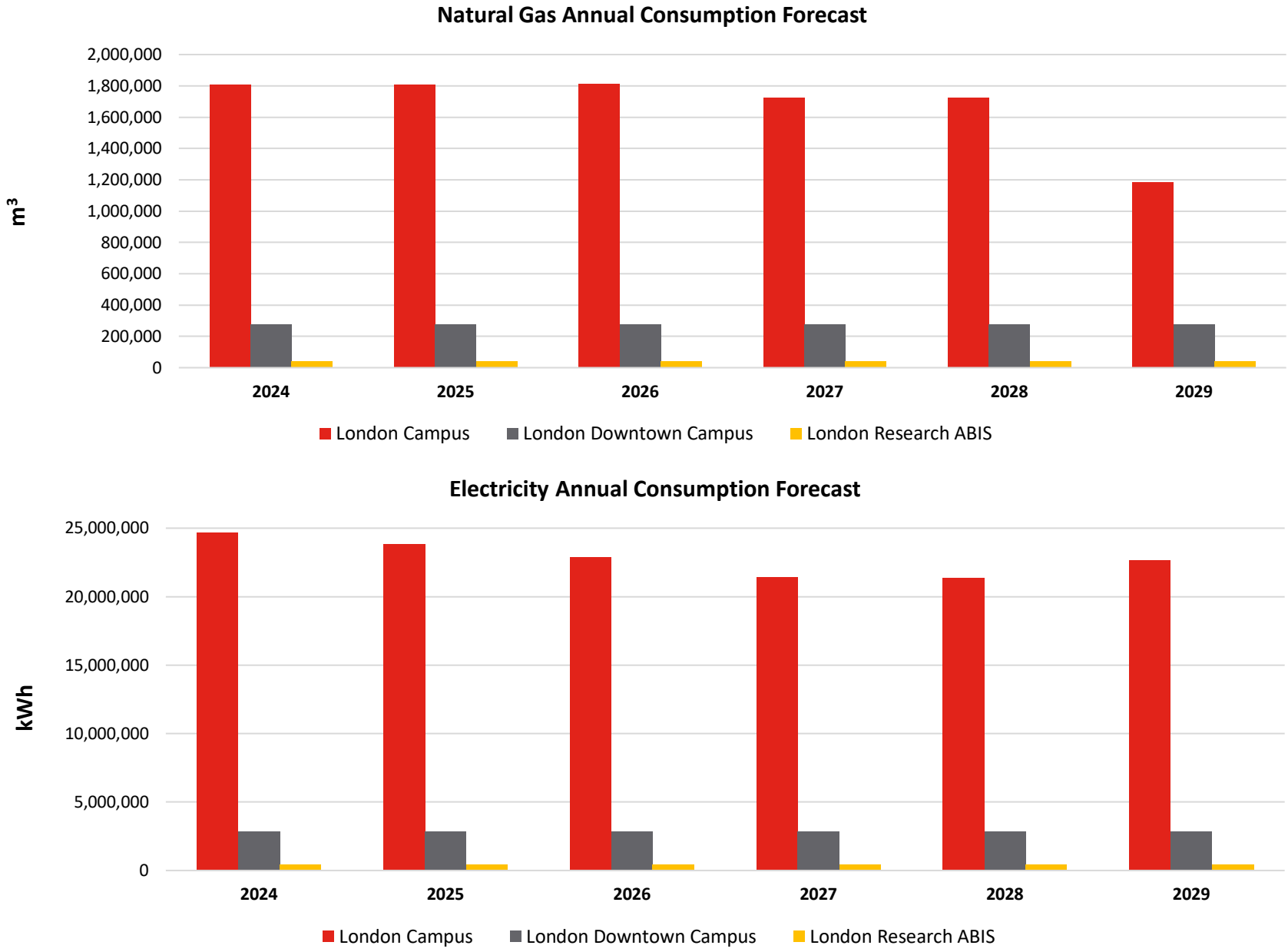


Figure 9. *Forecast of Annual Utility Consumption for the London Campus*

4.1.5. GHG Emissions Forecast

The forecasted greenhouse gas emissions for the London campus 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 on the data from the baseline year of 2023 and the provided emissions factors per year.**

Utility Source (tCO2e)	2023 (baseline)	2024	2025	2026	2027	2028	2029
London Campus							
Electricity (scope 2)	2,041	1,614	2,088	1,753	1,864	1,609	1,570
Natural Gas (scope 1)	3,476	3,476	3,476	3,484	3,315	3,315	2,272
Sub-Total	**5,517**	**5,090**	**5,564**	**5,237**	**5,179**	**4,924**	**3,842**
London Downtown Campus							
Electricity (scope 2)	233	184	247	216	245	212	195
Natural Gas (scope 1)	529	529	529	529	529	529	529
Sub-Total	**762**	**713**	**776**	**745**	**774**	**741**	**724**
London Research ABIS							
Electricity (scope 2)	35	27	37	32	36	32	29
Natural Gas (scope 1)	77	77	77	77	77	77	77
Sub-Total	**112**	**104**	**114**	**109**	**113**	**109**	**106**
Total	**6,390**	**5,908**	**6,453**	**6,091**	**6,067**	**5,774**	**4,672**
Reduction from Baseline Year (2023)		**8%**	**1%**	**5%**	**5%**	**10%**	**27%**

Table 12. *Forecast of Annual Greenhouse Gas Emissions for the London Campus*

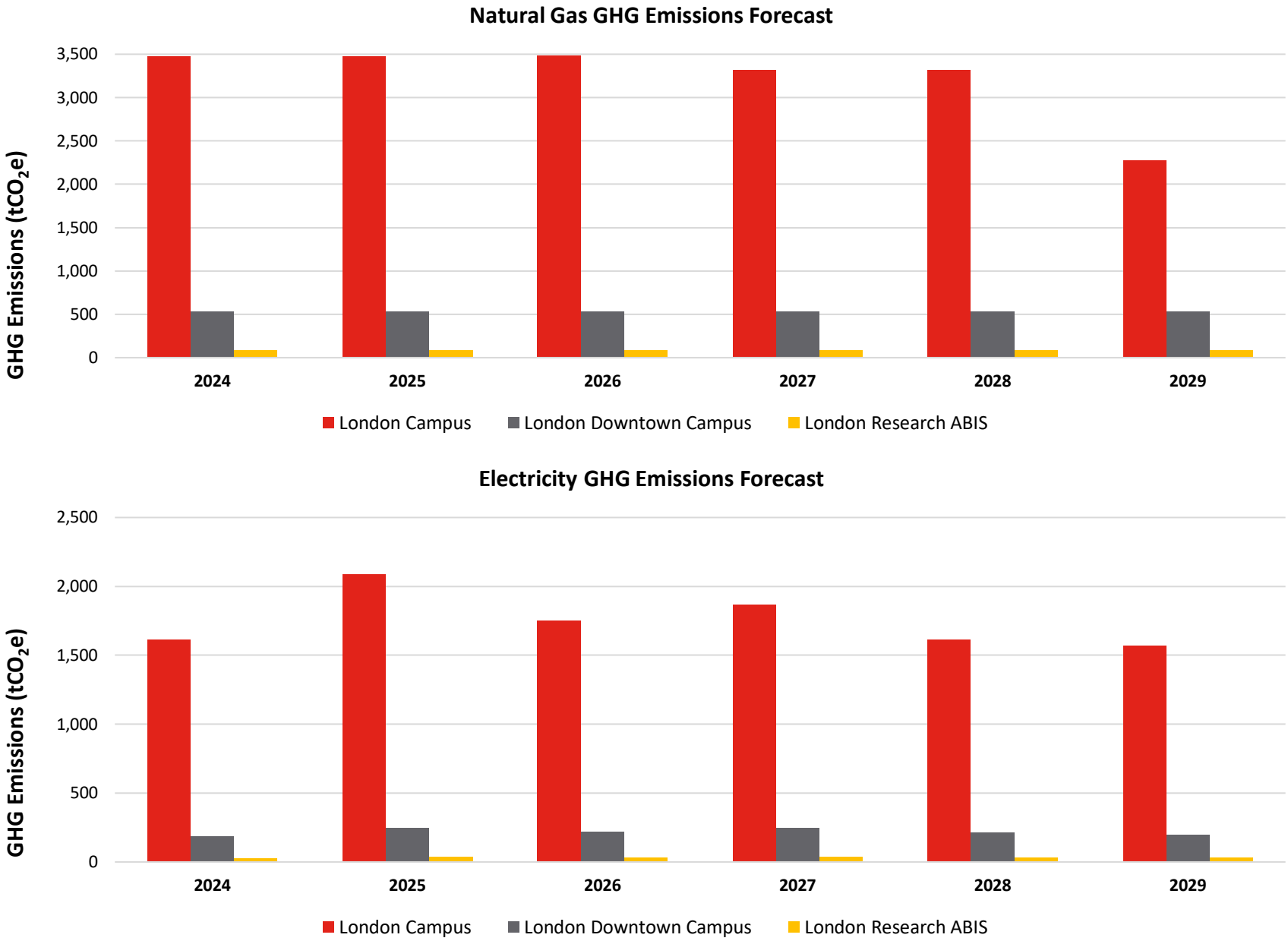


Figure 10. *Forecast of Annual Greenhouse Gas Emissions for the London Campus*

4.2. Simcoe/Norfolk Regional Campus

Picture 3. *Fanshawe College Simcoe/Norfolk Regional Campus*

Simcoe/Norfolk Regional Campus offers an assortment of programs from Business to Childhood Education to Welding and serves a community of students. They offer state-of-the-art facilities and equipment, support resources, and free parking. The atmosphere is ideal for getting started on a path to a new career, new training or exploring new interests. Please see Appendix 1: Facility Information for a list of included buildings.

Simcoe/Norfolk Regional Campus Facility Information	
Facility Name	**Fanshawe College Simcoe/Norfolk Regional Campus**
Address	634 Ireland Drive, Simcoe ON
Gross Area (Sq. Ft)	32,237
Type of Operation	Post-Secondary Education Institution

Table 13. *Simcoe/Norfolk Regional Campus*

4.2.1. Utility Analysis

Utilities to the site are electricity, natural gas and water. The following table summarizes the accounts for each utility. Utility consumption for each respective utility has been adjusted to fit a regular calendar year (365 days).

Utility	2019	2020	2021	2022	2023
Electricity (kWh)	324,000	284,000	317,330	366,709	390,072
Natural Gas (m^3)	23,141	19,403	19,060	26,749	24,018

Table 14. *Historic Annual Utility Consumption for the Simcoe Campus*

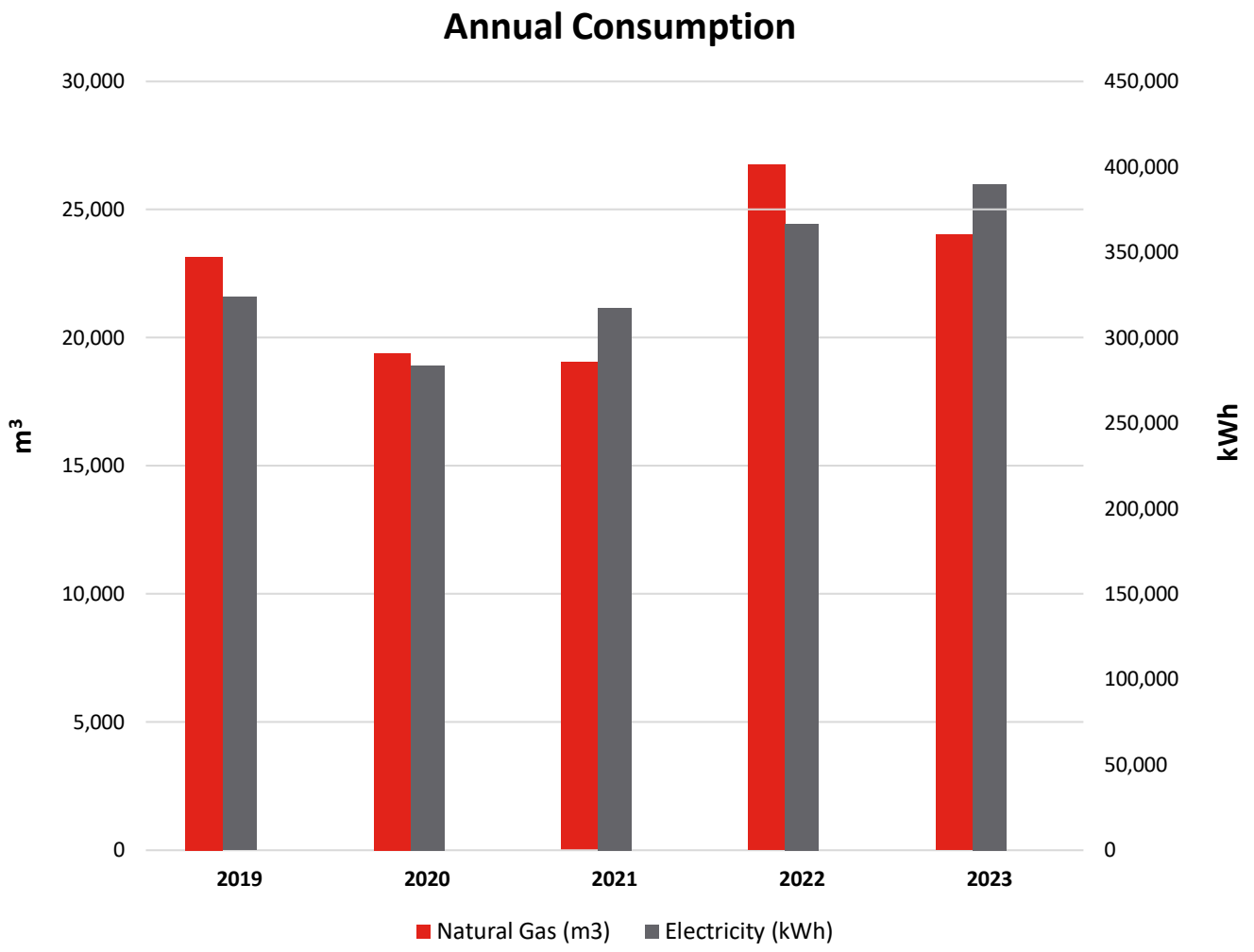


Figure 11. *Historic Annual Utility Consumption for the Simcoe/Norfolk Regional Campus*

4.2.2. GHG Emissions

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

Utility Source (tCO2e)	2019	2020	2021	2022	2023
Electricity (scope 2)	8	7	8	26	32
Natural Gas (scope 1)	44	37	37	51	46
Totals	53	45	45	77	78

Table 15. *Historic Annual Utility Consumption for the Simcoe/Norfolk Regional Campus*

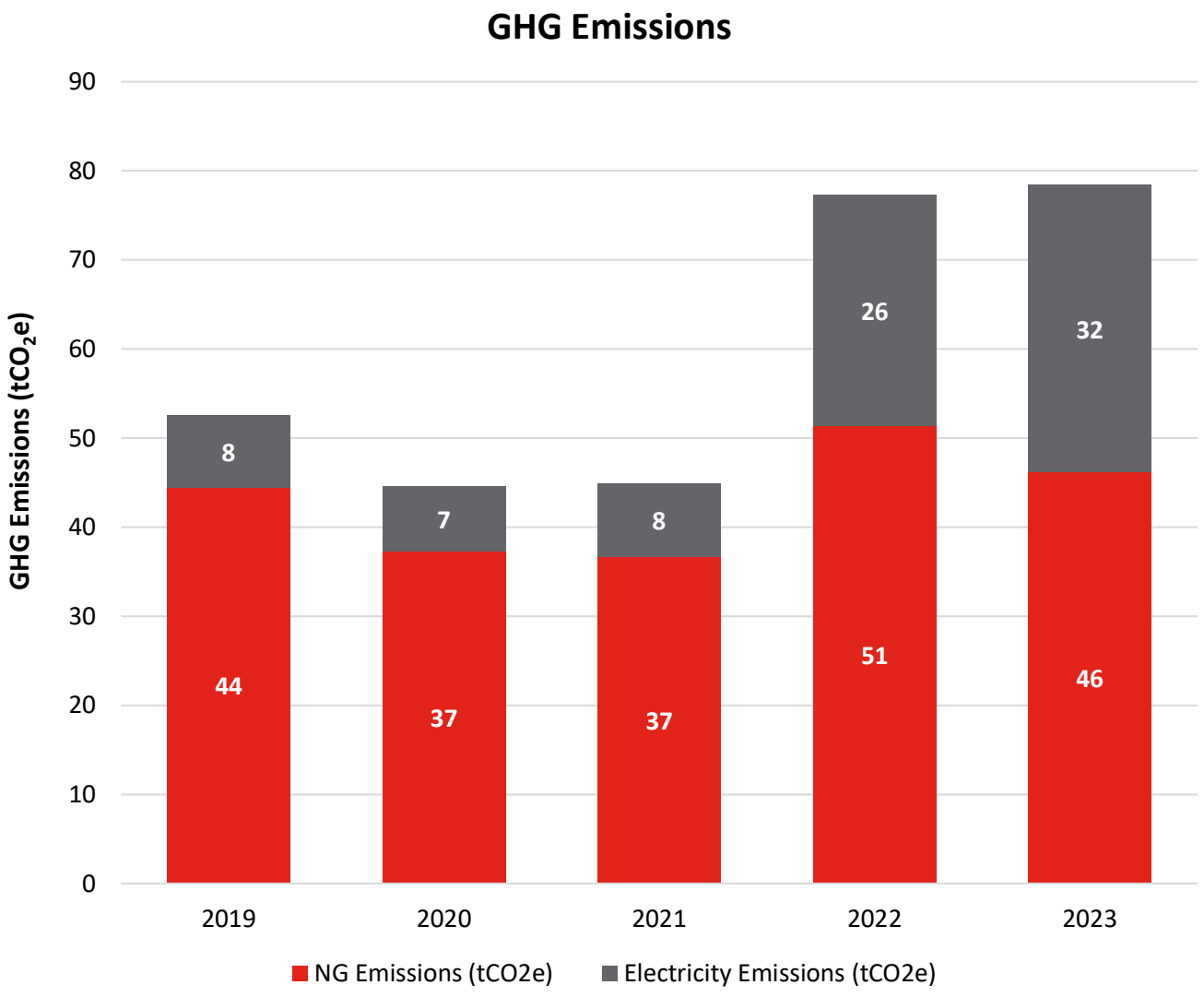


Figure 12. *Historic Annual Utility Consumption for the Simcoe/Norfolk Regional Campus*

4.2.3. Utility Consumption Forecast

There are currently no proposed energy savings measures for Simcoe Campus. Fanshawe College is committed to continuous review of opportunities for this site and will continue to operate with energy conservation and demand management in mind. The forecasted electricity and natural gas data is below, based on 2023 consumption. **The percentage of change is based on the data from the baseline year of 2023.**

	2023 (baseline)	2024		2025		2026		2027		2028		2029	
		Units	% Change	Units	% Change	Units	% Change	Units	% Change	Units	% Change	Units	% Change
Electricity (kWh)	**390,072**	390,072	0%	390,072	0%	390,072	0%	390,072	0%	390,072	0%	390,072	0%
Natural Gas (m^3)	**24,018**	24,018	0%	24,018	0%	24,018	0%	24,018	0%	24,018	0%	24,018	0%

Table 16. *Forecast of Annual Utility Consumption for the Simcoe/Norfolk Regional Campus*

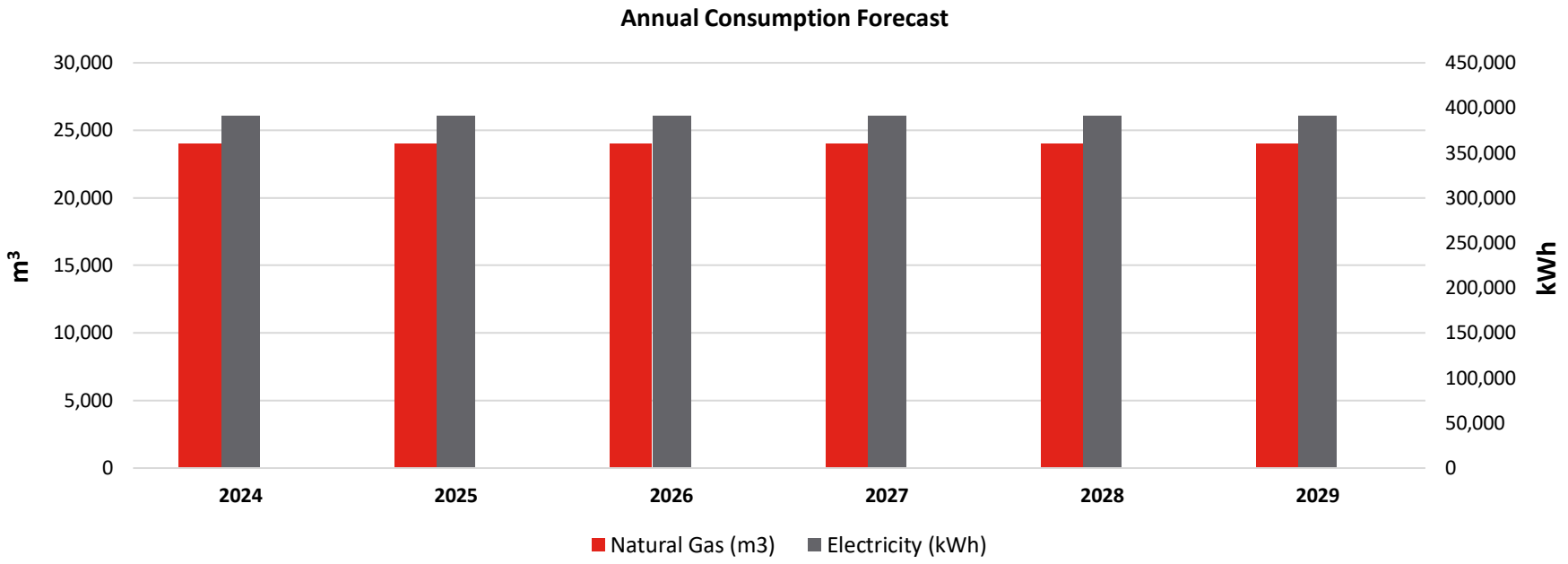


Figure 13. *Forecast of Annual Utility Consumption for the Simcoe/Norfolk Regional Campus*

4.2.4. GHG Emissions Forecast

The forecasted greenhouse gas emissions for the Simcoe campus 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 on the data from the baseline year of 2023 and the provided emissions factors per year.**

Utility Source (tCO2e)	2023 (baseline)	2024	2025	2026	2027	2028	2029
Electricity (scope 2)	**32**	26	34	30	34	29	27
Natural Gas (scope 1)	**46**	46	46	46	46	46	46
Totals	**78**	**72**	**80**	**76**	**80**	**76**	**73**
Reduction from Baseline Year (2023)		**9%**	**2%**	**3%**	**2%**	**4%**	**7%**

Table 17. Forecast of Annual Greenhouse Gas Emissions for the Simcoe/Norfolk Regional Campus

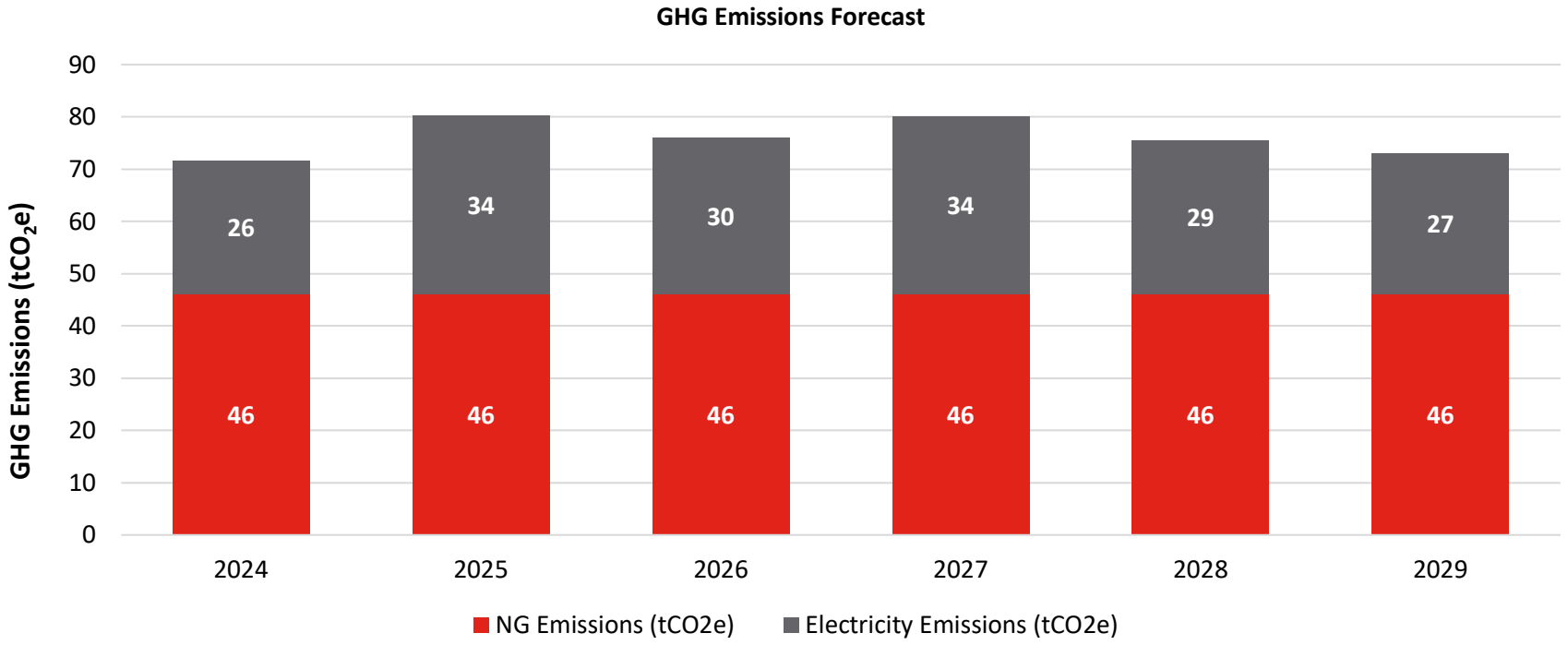


Figure 14. GHG Emissions Forecast

4.3. St. Thomas/ Elgin Regional Campus

Picture 4. *Fanshawe College St.Thomas/Elgin Regional Campus*

Nestled in picturesque Southwestern Ontario, the St. Thomas/ Elgin Regional Campus provides classes for over 2,000 full-time and part-time students. Offering programs from health and human services to state-of-the-art technical programs, the staff and students are committed to their futures. This campus features smaller class sizes, a full-service cafeteria, library, resource centre and student success support. Please see Appendix 1: Facility Information for a list of included buildings.

St. Thomas/Elgin Regional Campus Facility Information	
Facility Name	**Fanshawe College St. Thomas/Elgin Regional Campus**
Address	120 Bill Martin Parkway, St. Thomas ON
Gross Area (Sq. Ft)	51,726
Type of Operation	Post-Secondary Education Institution

Table 18. *St. Thomas/Elgin Regional Campus Facility Information*

4.3.1. Utility Analysis

Utilities to the site are electricity, natural gas and water. The following table summarizes the accounts for each utility. Utility consumption for each respective utility has been adjusted to fit a regular calendar year (365 days).

Utility	2019	2020	2021	2022	2023
Electricity (kWh)	740,000	827,000	833,000	772,000	798,000
Natural Gas (m^3)	70,537	80,952	89,980	85,874	62,288

Table 19. *Historic Annual Utility Consumption for the St. Thomas/Elgin Regional Campus*

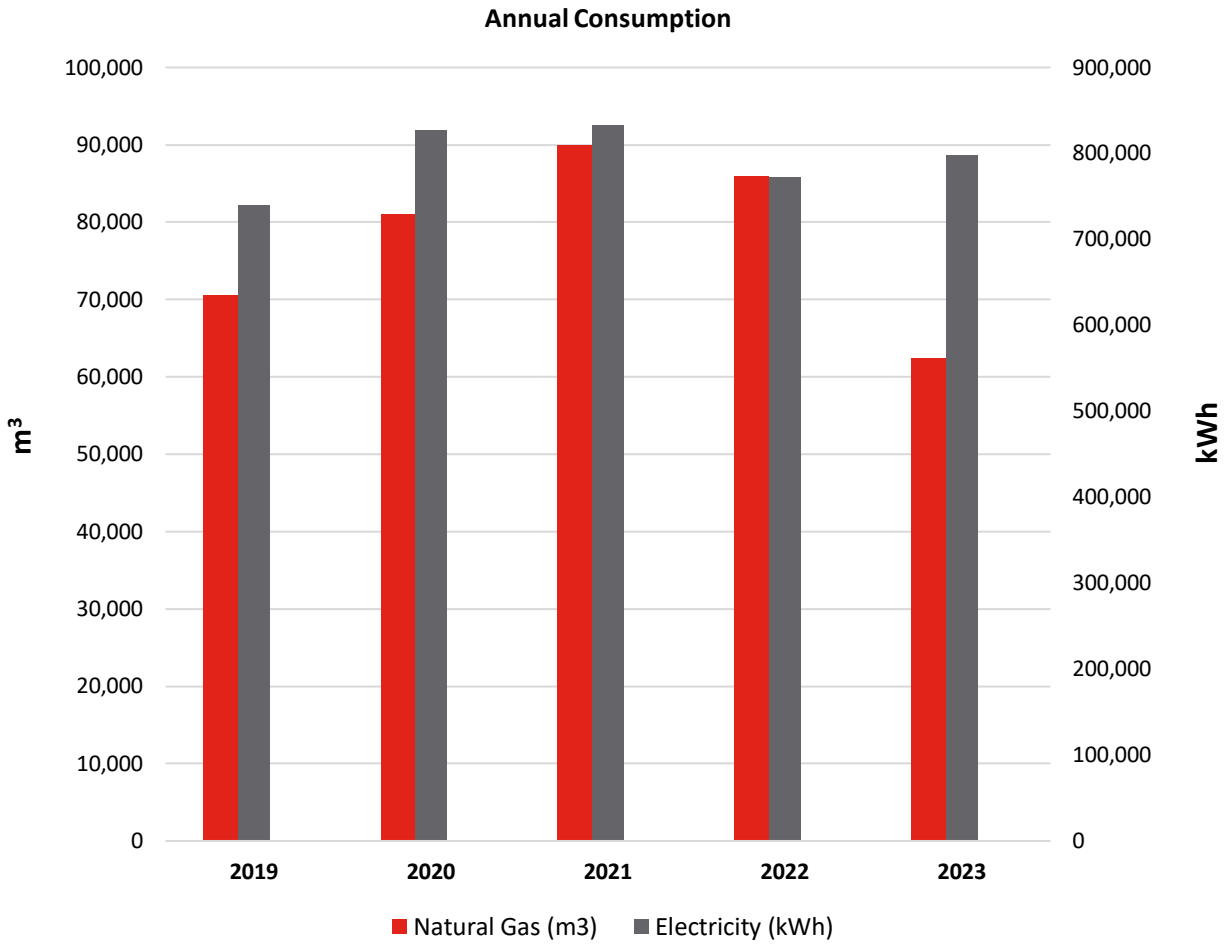


Figure 16. *Historic Annual Utility Consumption for the St. Thomas/Elgin Regional Campus*

4.3.2. GHG Emissions

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

Utility Source (tCO2e)	2019	2020	2021	2022	2023
Electricity (scope 2)	19	21	22	55	66
Natural Gas (scope 1)	136	156	173	165	120
Totals	**155**	**177**	**195**	**220**	**186**

Table 20. *Historic Annual Greenhouse Gas Emissions for the St. Thomas/Elgin Regional Campus*

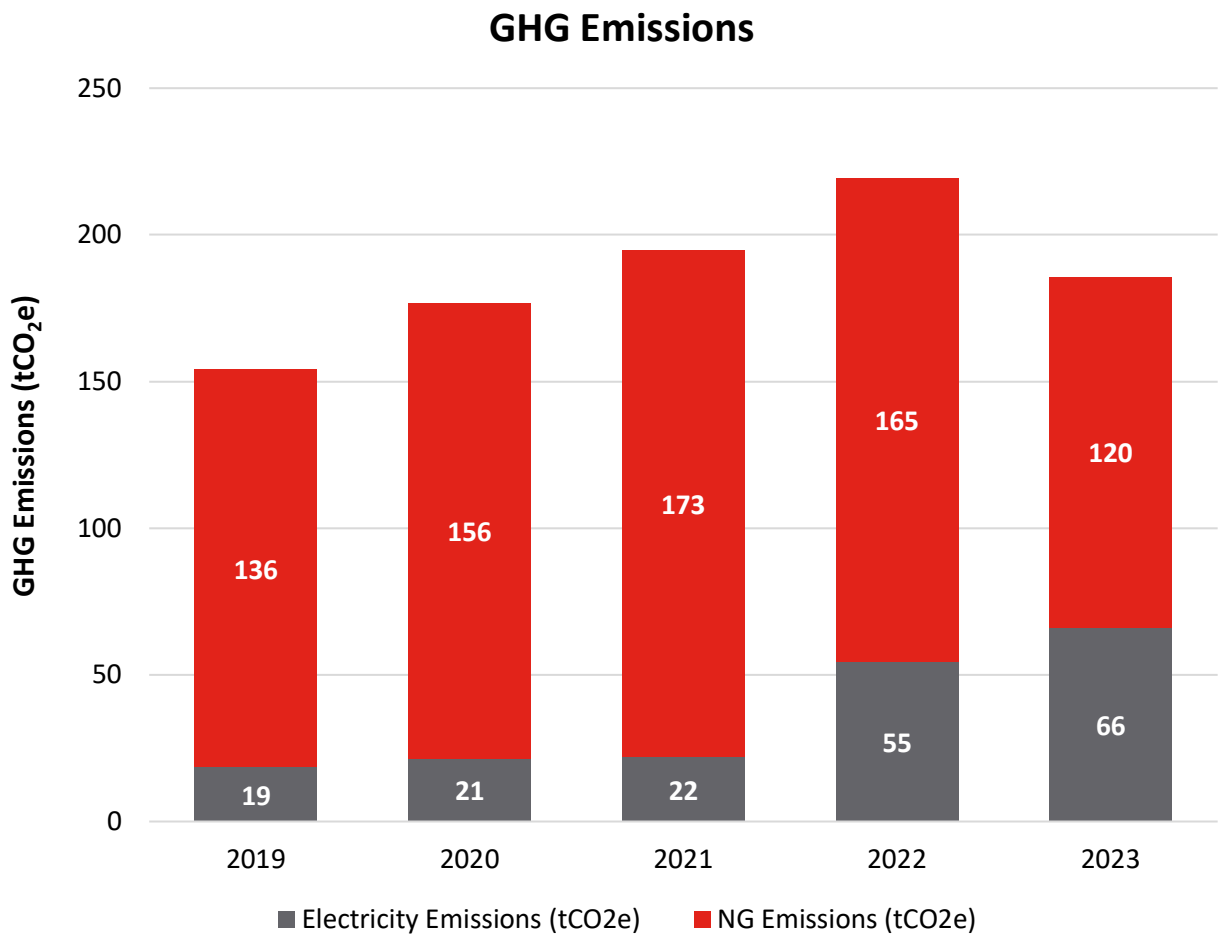


Figure 17. *Historic Annual Greenhouse Gas Emissions for the St. Thomas/Elgin Regional Campus*

4.3.3. Proposed Conservation Measures

The energy analysis has revealed several conservation strategies for the facility. St. Thomas Campus' proposed energy and water saving initiatives are summarized in the table below outlining the targeted utilities. These measures will remain in place until another, more efficient and cost-effective technology is found.

Measure	Estimated Annual Savings			Project Cost	Implementation Year
	Electricity (kWh)	Natural Gas (m^3)	Cost ($)		
Recommissioning and Adjust Schedule	8,000	10,856	$5,220	$21,854	2025
Lighting Fixture Retrofit	20,000	-712	$2,326	$38,061	2025
Lighting Control	14,165	0	$1,841	$36,450	2025
Upgrade AHUs	15,345	0	$1,995	$37,125	2026
Rooftop Solar 250 kW	300,000	0	$39,000	$550,000	2028
Total	**357,510**	**10,144**	**$50,382**	**$683,489**	**-**

Table 21. *Targeted Utilities and Proposed Conservation Measures for the St. Thomas/Elgin Regional Campus*

4.3.4. Utility Consumption Forecast

From 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 on the data from the baseline year of 2023.**

	2023 (baseline)	2024		2025		2026		2027		2028		2029	
		Units	% Change	Units	% Change	Units	% Change	Units	% Change	Units	% Change	Units	% Change
Electricity (kWh)	**798,000**	798,000	0%	755,835	5%	740,490	7%	740,490	7%	440,490	45%	440,490	45%
Natural Gas (m^3)	**62,288**	62,288	0%	52,144	16%	52,144	16%	52,144	16%	52,144	16%	52,144	16%

Table 22. *Forecast of Annual Utility Consumption for the St. Thomas/Elgin Regional Campus*

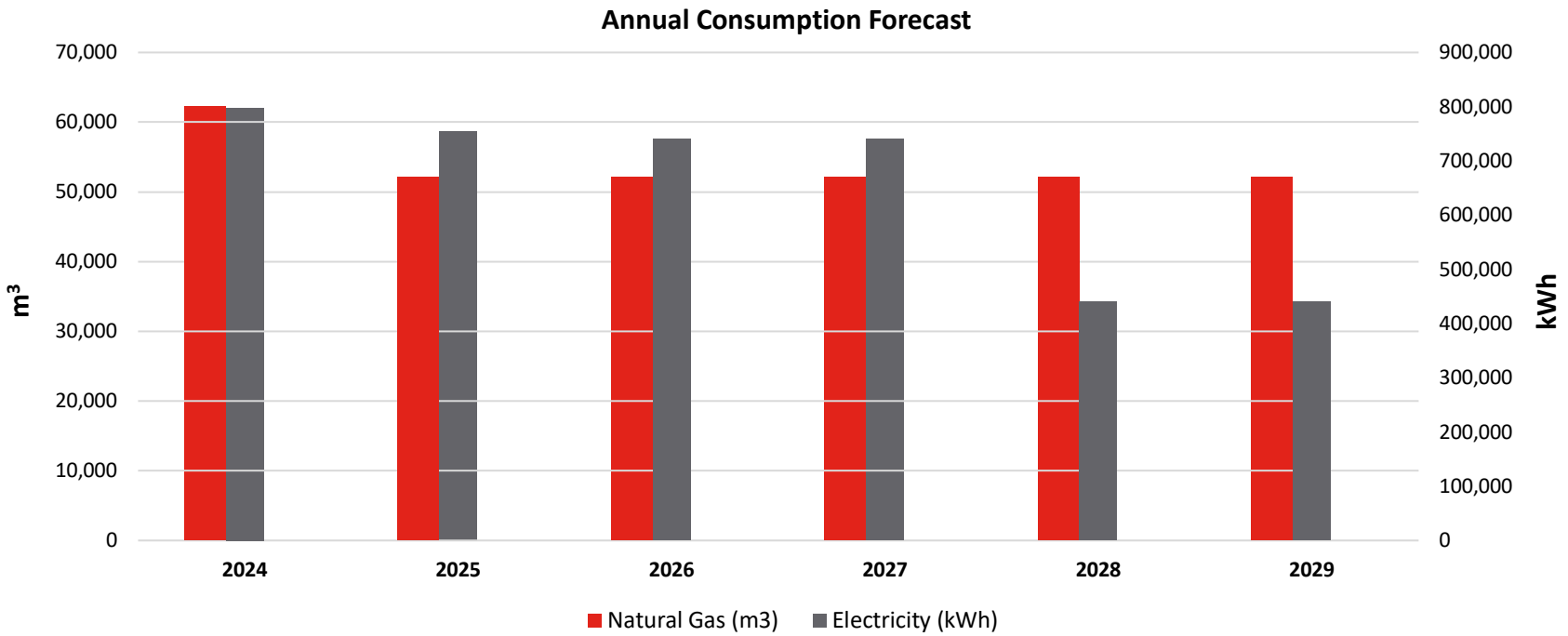


Figure 18. *Forecast of Annual Utility Consumption for the St. Thomas/Elgin Regional Campus*

4.3.5. GHG Emissions Forecast

The forecasted greenhouse gas emissions for the St. Thomas campus 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 on the data from the baseline year of 2023 and the provided emissions factors per year.**

Utility Source (tCO2e)	2023 (baseline)	2024	2025	2026	2027	2028	2029
Electricity (scope 2)	**66**	52	66	57	64	33	31
Natural Gas (scope 1)	**120**	120	100	100	100	100	100
Totals	**186**	**172**	**167**	**157**	**165**	**133**	**131**
Reduction from Baseline Year (2023)		**7%**	**10%**	**15%**	**11%**	**28%**	**30%**

Table 23. *Forecast of Annual Greenhouse Gas Emissions for the St. Thomas/Elgin Regional Campus*

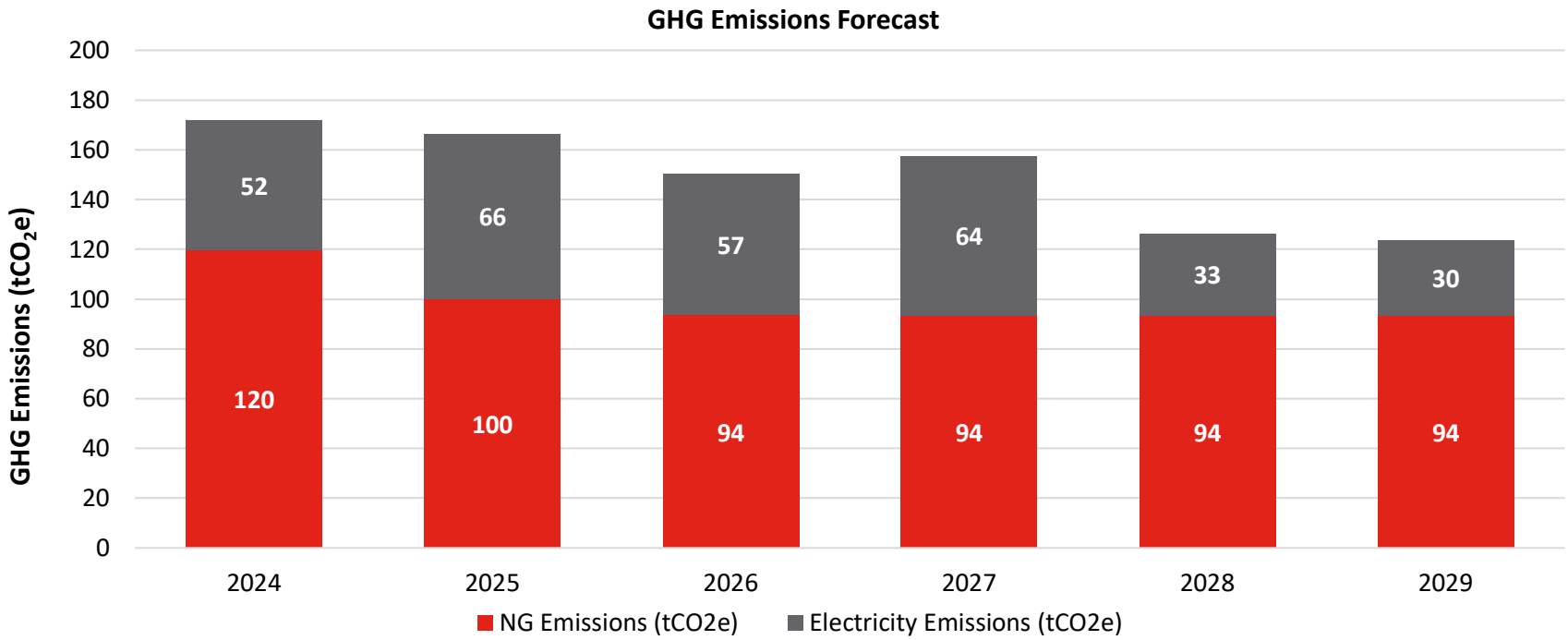


Figure 19. *Forecast of Annual Greenhouse Gas Emissions for the St. Thomas/Elgin Regional Campus*

4.4. Woodstock/Oxford Regional Campus

Picture 5. *Fanshawe Collge Woodstock/Oxford Regional Campus*

The Woodstock/Oxford Regional Campus offers training and education in the fields of business, computers, heath care, management, manufacturing and academic upgrading. Located on 50 acres of beautifully landscaped property, you will receive stunning views. The campus caters to full-time, part-time and self-paced learning opportunities with small class sizes and modern facilities. Please see Appendix 1: Facility Information for a list of included buildings.

Woodstock/Oxford Regional Campus Facility Information	
Facility Name	**Fanshawe College Woodstock/Oxford Regional Campus**
Address	369 Finkle Street, Woodstock ON
Gross Area (Sq. Ft)	25,341
Type of operation	Post-Secondary Education Institution

Table 24. *Woodstock/Oxford Regional Campus Facility Information*

4.4.1. Utility Analysis

Utilities to the site are electricity, natural gas and water. The following table summarizes the accounts for each utility. Utility consumption for each respective utility has been adjusted to fit a regular calendar year (365 days).

Utility	2019	2020	2021	2022	2023
Electricity (kWh)	224,000	319,000	284,000	288,000	211,000
Natural Gas (m^3)	15,312	17,699	17,073	17,557	17,236

Table 25. *Historic Annual Utility Consumption for the Woodstock/Oxford Regional Campus*

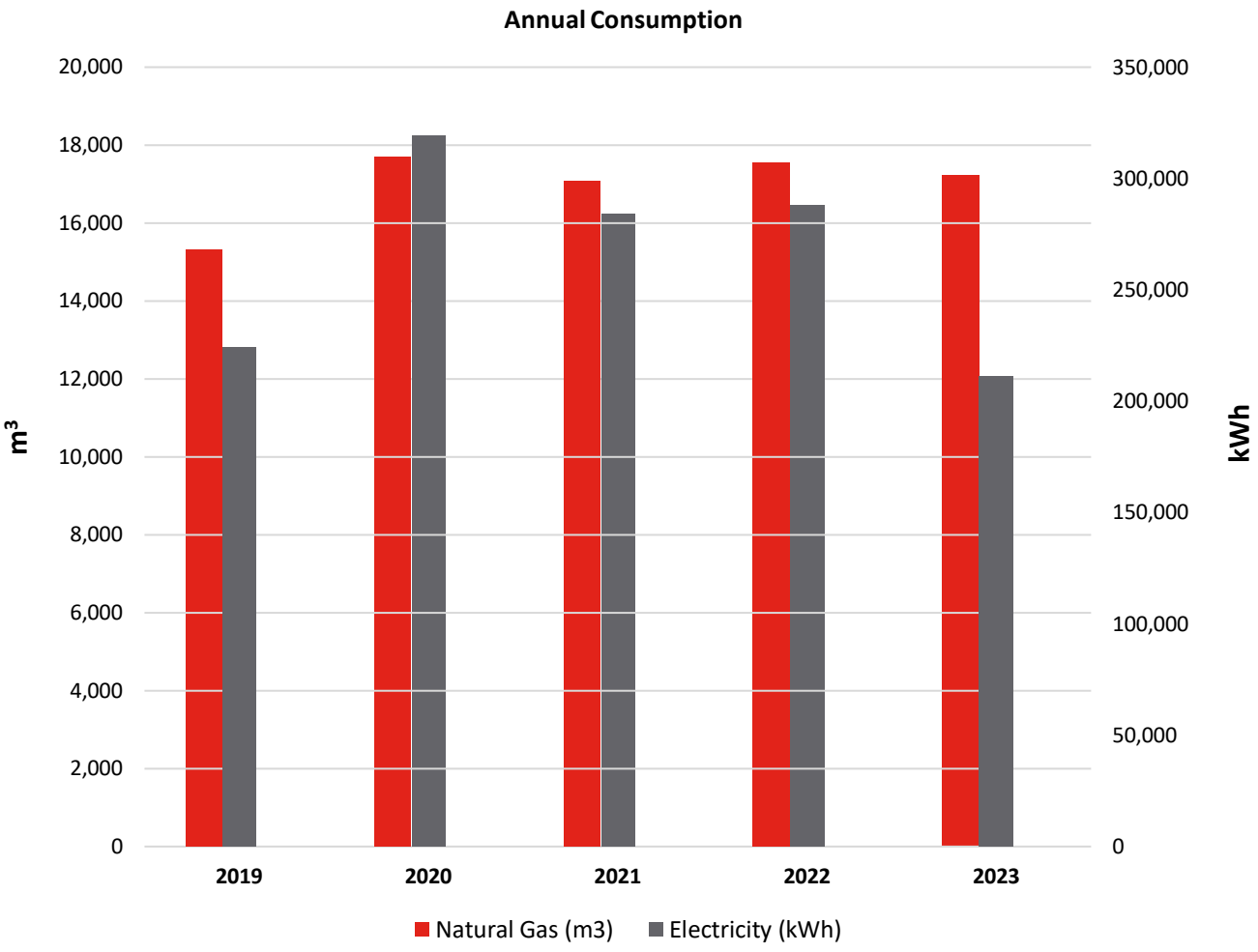


Figure 20. *Historic Annual Utility Consumption for the Woodstock/Oxford Regional Campus*

4.4.2. GHG Emissions

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

Utility Source (tCO2e)	2019	2020	2021	2022	2023
Electricity (scope 2)	6	8	7	20	17
Natural Gas (scope 1)	29	34	33	34	33
Totals	**35**	**42**	**40**	**54**	**50**

Table 26. *Historic Annual Greenhouse Gas Emissions for the Woodstock/Oxford Regional Campus*

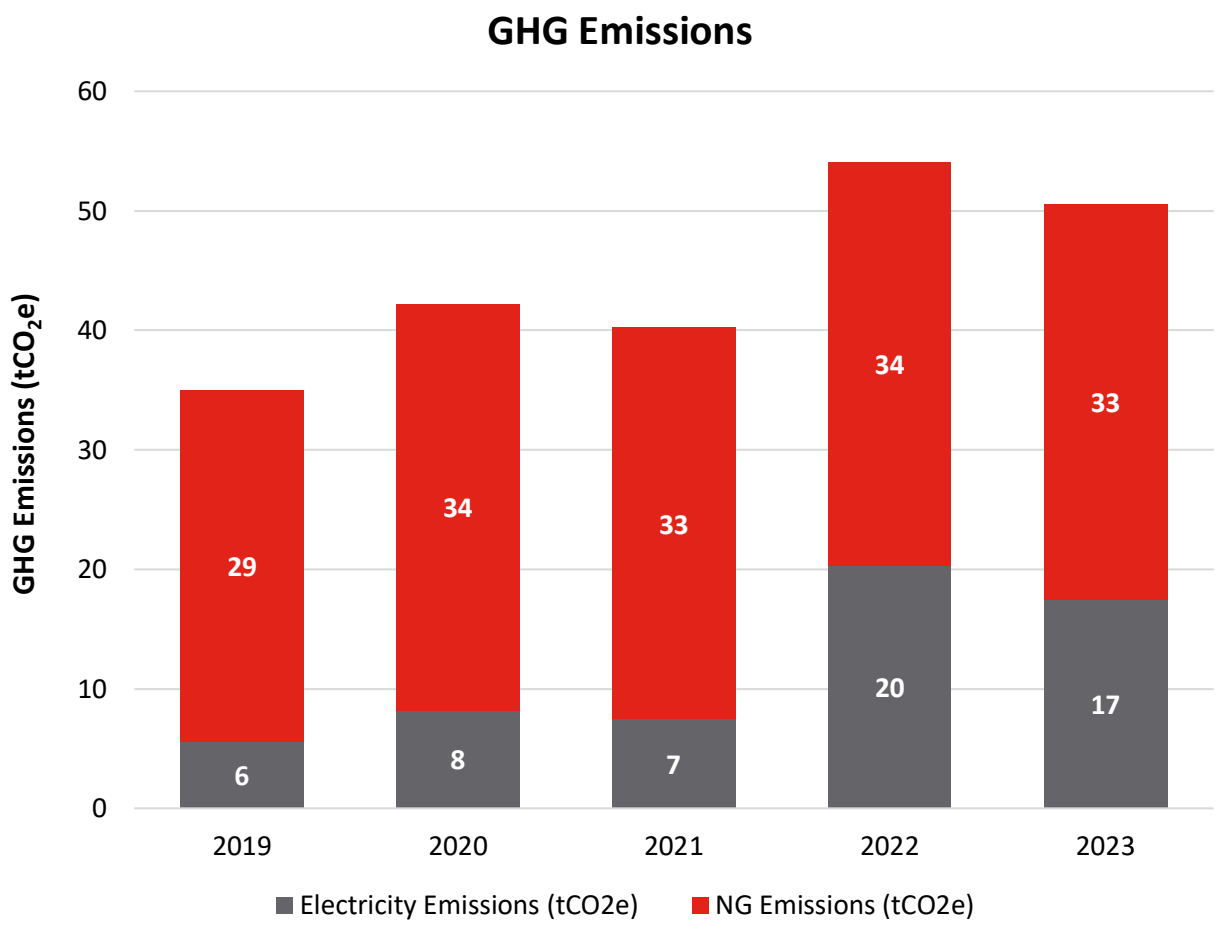


Figure 21. *Historic Annual Greenhouse Gas Emissions for the Woodstock/Oxford Regional Campus*

4.4.3. Utility Consumption Forecast

There are currently no proposed energy savings measures for Woodstock Campus. Fanshawe College is committed to continuous review of opportunities for this site and will continue to operate with energy conservation and demand management in mind. The forecasted electricity and natural gas data is below, based on 2023 consumption. **The percentage of change is based on the data from the baseline year of 2023.**

	2023 (baseline)	2024		2025		2026		2027		2028		2029	
		Units	% Change	Units	% Change	Units	% Change	Units	% Change	Units	% Change	Units	% Change
Electricity (kWh)	**211,000**	211,000	0%	211,000	0%	211,000	0%	211,000	0%	211,000	0%	211,000	0%
Natural Gas (m^3)	**17,236**	17,236	0%	17,236	0%	17,236	0%	17,236	0%	17,236	0%	17,236	0%

Table 27. Forecast of Annual Utility Consumption for the Woodstock/Oxford Regional Campus

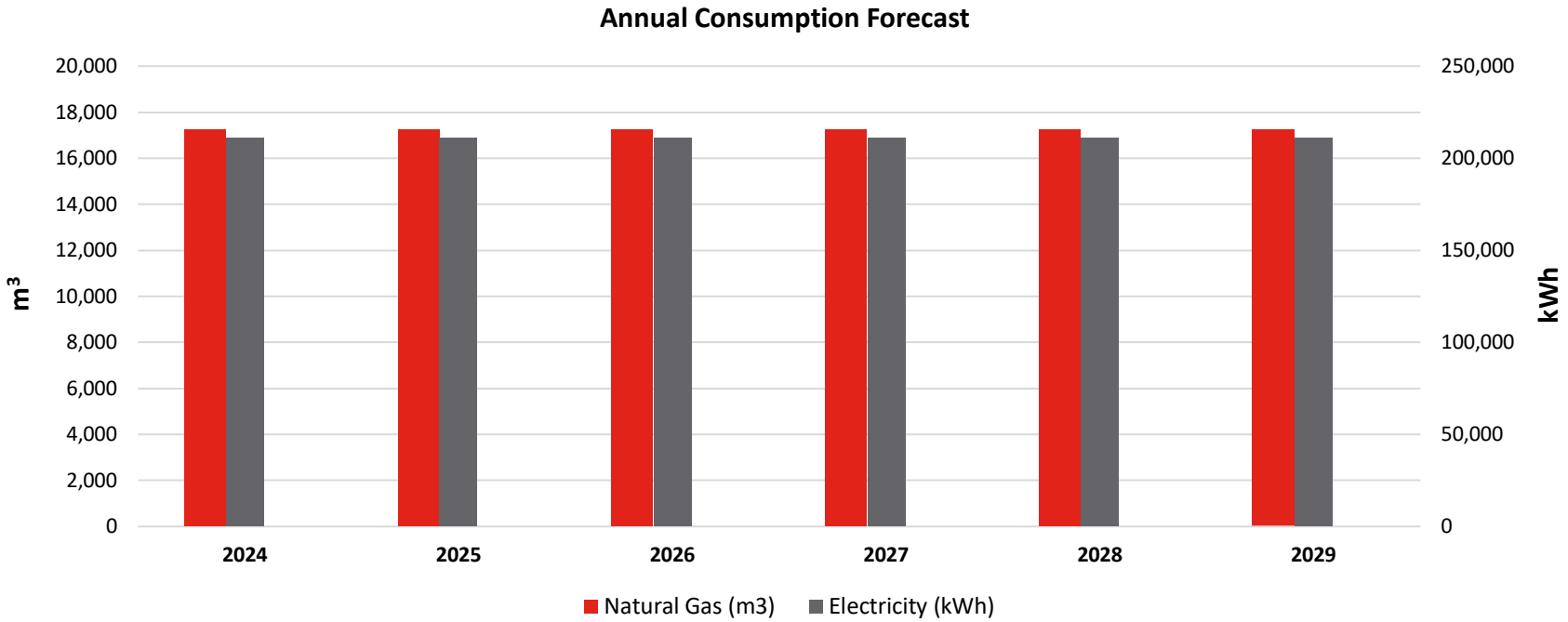


Figure 22. Forecast of Annual Utility Consumption for the Woodstock/Oxford Regional Campus

4.4.4. GHG Emissions Forecast

The forecasted greenhouse gas emissions for the Woodstock campus 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 on the data from the baseline year of 2023 and the provided emissions factors per year.**

Utility Source (tCO2e)	2023 (baseline)	2024	2025	2026	2027	2028	2029
Electricity (scope 2)	17	14	19	16	18	16	15
Natural Gas (scope 1)	33	33	33	33	33	33	33
Totals	**50**	**47**	**52**	**49**	**51**	**49**	**48**
Reduction from Baseline Year (2023)		**7%**	**2%**	**3%**	**2%**	**3%**	**6%**

Table 28. Forecast of Annual Greenhouse Gas Emissions for the Woodstock/Oxford Regional Campus

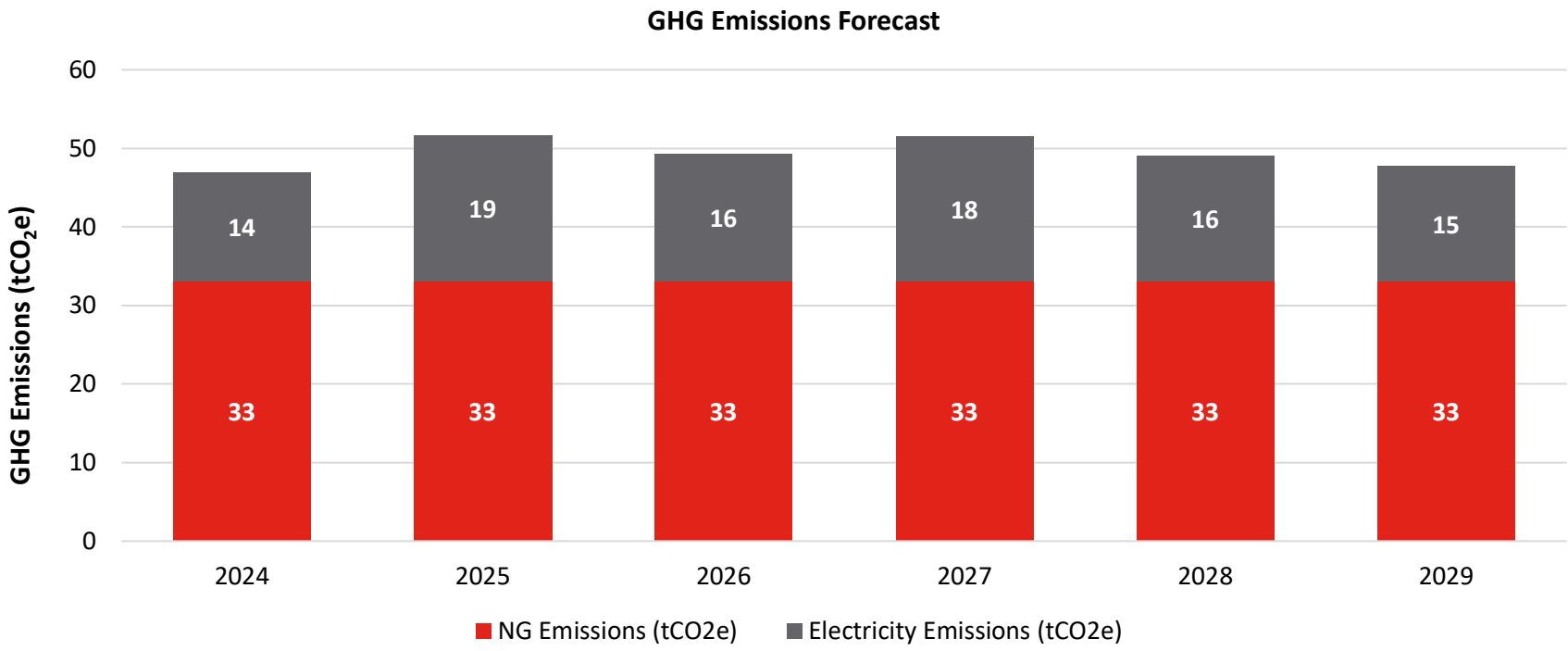


Figure 23. Forecast of Annual Greenhouse Gas Emissions for the Woodstock/Oxford Regional Campus

5. College Outlook

5.1. Campus-Wide Utility Consumption

From implementing the energy conservation measures stated in the previous sections, in respective campuses, Fanshawe Colleges' campus-wide projected electricity and natural gas use could be forecasted based on the utility savings generated from individual measures. The campus-wide forecasted utility consumption is tabulated below. **The percentage of change is based on the data from the baseline year of 2023.**

	2023 (baseline)	2024		2025		2026		2027		2028		2029	
		Units	% Change	Units	% Change	Units	% Change	Units	% Change	Units	% Change	Units	% Change
Electricity (kWh)	**29,281,072**	29,281,072	0%	28,368,963	3%	27,429,318	6%	25,980,728	11%	25,619,298	13%	26,929,487	8%
Natural Gas (m^3)	**2,228,230**	2,228,230	0%	2,218,086	0%	2,222,462	0%	2,134,277	4%	2,134,277	4%	1,591,467	29%

Table 29. Forecast of Annual Utility Consumption for All Campuses

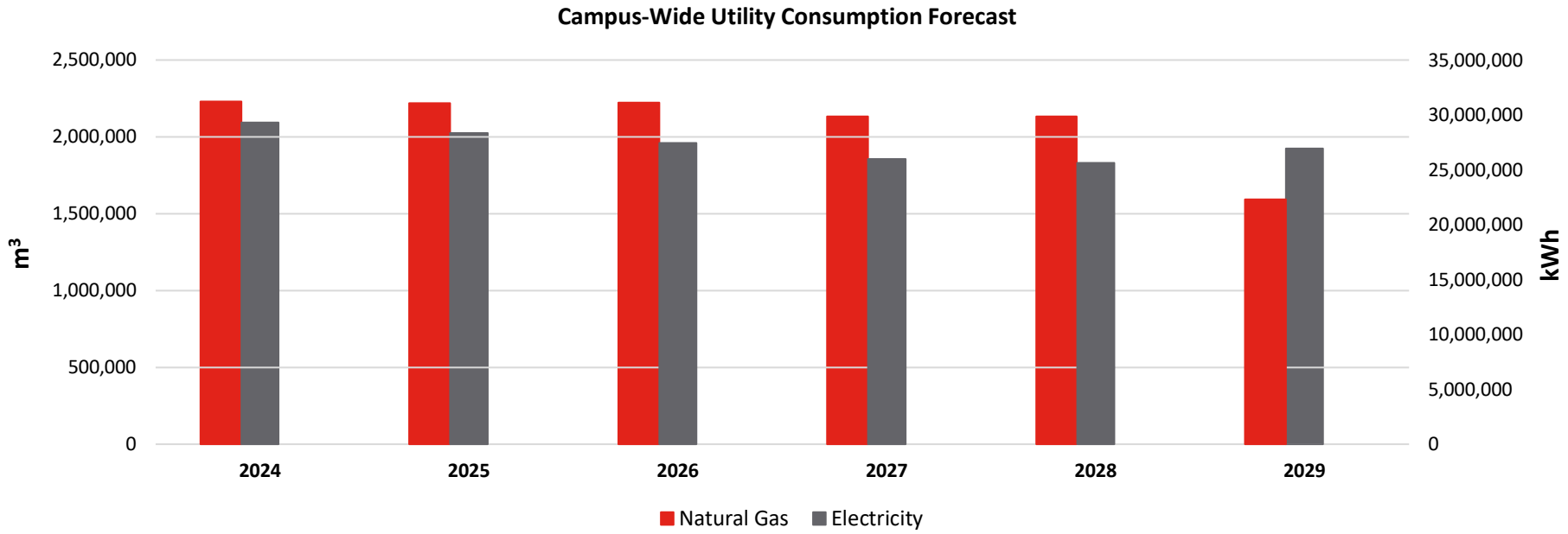


Figure 24. Forecast of Annual Utility Consumption for All Campuses

5.2. Campus-Wide GHG Emissions

The organizational greenhouse gas emissions for Fanshawe College are calculated based on the forecasted campus-wide energy consumption data analyzed in the previous section and are tabulated in the following table. **The percentage of reduction is based on the data from the baseline year of 2023.**

Utility Source (tCO2e)	2023 (baseline)	2024	2025	2026	2027	2028	2029
Electricity (scope 2)							
Natural Gas (scope 1)							
Totals	6,705	6,198	6,752	6,373	6,363	6,032	4,923
Reduction from Baseline Year (2023)		8%	1%	5%	5%	10%	27%

Table 30. Forecast of Annual Greenhouse Gas Emissions for All Campuses

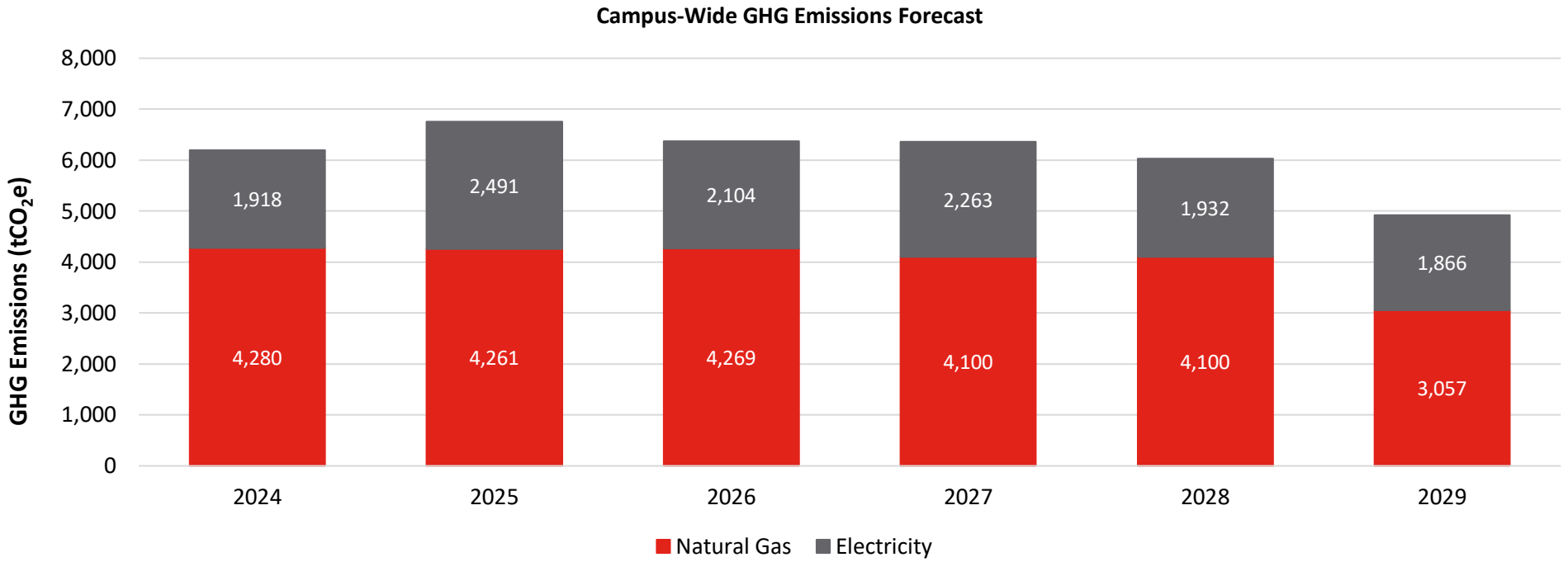


Figure 25. Forecast of Annual Greenhouse Gas Emissions for All Campuses

6. Closing Comments

Thank you to all who contributed to Fanshawe College's Energy Conservation & Demand Management Plan. We consider our facilities a primary source of education and an integral part of the local community. Our goal is to be able to use our facilities efficiently and effectively to maximize our ability to provide the highest quality of education services while integrating environmental stewardship into all aspects of facility operations.

The Senior Management Team at Fanshawe College, approved this Energy Conservation & Demand Management Plan.

This ECDM plan was created through a collaborative effort between Fanshawe College and Blackstone Energy Services

7. Appendix 1: Facility Information

Building	Address	Campus	Building Type	Own/Lease	Area (GSF)
A Building	1001 Fanshawe College Blvd, London	London Campus	1,2,3,6	Own	120,912
B Building	1001 Fanshawe College Blvd, London	London Campus	1,2,3,6	Own	199,552
C Building	1001 Fanshawe College Blvd, London	London Campus	1,2,3,	Own	79,842
D Building	1001 Fanshawe College Blvd, London	London Campus	1,2,3,6	Own	239,302
E Building	1001 Fanshawe College Blvd, London	London Campus	1,2,3,6	Own	49,455
F Building	1001 Fanshawe College Blvd, London	London Campus	1,2,3,6	Own	135,970
G Building	1001 Fanshawe College Blvd, London	London Campus	1,2,3,6	Own	30,819
H Building	1001 Fanshawe College Blvd, London	London Campus	1,2,3	Own	77,135
J Building	1001 Fanshawe College Blvd, London	London Campus	1,2,3,5,6	Own	143,547
K Building	1001 Fanshawe College Blvd, London	London Campus	1,2,3	Own	13,369
L Building	1001 Fanshawe College Blvd, London	London Campus	1,2,3,6	Own	57,127
M Building	1001 Fanshawe College Blvd, London	London Campus	1,2,3,6	Own	91,503
N Building	1001 Fanshawe College Blvd, London	London Campus	1,2,3,	Own	4,024
R1 Residence Building	1001 Fanshawe College Blvd, London	London Campus	1,2,4	Own	150,017
R2 Residence Building	1001 Fanshawe College Blvd, London	London Campus	1,4	Own	142,163
R3 Residence Building	1001 Fanshawe College Blvd, London	London Campus	4	Own	154,886
SC Building	1001 Fanshawe College Blvd, London	London Campus	1	Own	50,715
SUB Building	1001 Fanshawe College Blvd, London	London Campus	1	Own	13,320
T Building	1001 Fanshawe College Blvd, London	London Campus	1,2,3,6	Own	111,668
R4(12 Buildings)	900 Fanshawe College Blvd. London	London Campus	4	Own	136,488
Y Building	1001 Air Ontario Blvd. London	London Campus	1,2,3,	Own	86,203
Z Building	1764 Oxford Street. London ON	London Campus	1,2,3,6	Own	149,865
LD-A Building	137 Dundas Street London ON	London Downtown	1,2,3,6	Own	58,593
LD-B Building	130 Dundas Street London ON	London Downtown	1,2,3,6	Own	120,451
2 Cuddy Warehouse	2 Cuddy Crt London ON	London Campus	2	Own	45,456
LR-A CCPV	2555 Bonder Rd. London ON	London Research	1,3	Own	35,575
Nelson Plaza	155 Clarke RD, London ON	London Campus	1,2	LEASE	3,467
431 Richmond (LDXB)	431 Richmond Street London ON	London Downtown	1,2	LEASE	8,142
Cuddy Farm	28443 Centre Rd, Strathroy ON	London Campus	3	Own	10,624
St Thomas Elgin Campus	120 Bill Martyn Pkwy, St. Thomas	St. Thomas	1,2,3,6	Own	48,871
Woodtsock/Oxford County Regional Campus	369 Finkle Street Woodstock	Woodstock	1,2,3,6	LEASE	17,674
Woodstock/Oxford County Regional Campus	634 Ireland Rd, Simcoe	Simcoe	1,2,3,6	Own	32,237
Elgin Mall (St. Thomas)	417 Wellington St. St.Thomas ON	St. Thomas	1,2	LEASE	2,855
LC Sign	1001 Fanshawe College Blvd, London	London Campus	-	Own	-
Oxbury plaza	1299 Oxford St london, ON	London Campus	1	LEASE	34,690
London South Campus	1060 Wellington rd London On	London Campus	1,2,6	LEASE	39,921
London South Campus Sign	Bradley St London On	London Campus	-	LEASE	-
45 Metcallf (WCXJ)	45 Metcalf Woodstock	Woodstock	1,2	LEASE	7,667
Total	**38**	**-**	**-**	**-**	**2,704,105**

Building Activity	Description
1	Administrative offices and related facilities
2	Classrooms and related facilities
3	Laboratories
4	Student residences that have more than three storeys or area of 600sqM
5	Student recreational facilities and athletic facilities
6	Libraries
7	Parking Garages

8. Appendix 2: 2023 Energy Usage

Building	Electrical (MWh)	Natural Gas (eMWh)	Solar (eMWh)	Total Energy (eMWh)	Natural Gas m^3	Total GHG (tCO_2e)
A Building	1,552	134		1,686	12,682	153
B Building	2,225	1,648		3,873	156,075	484
C Building	432	88		520	8,373	52
D Building	3,162	4,741		7,903	448,923	1,124
E Building	709	0		709	0	59
F Building	1,151	1,489		2,640	140,989	366
G Building	799	87		886	8,214	82
H Building	1,003	1,078	219	2,301	102,096	279
J Building	1,471	689		2,160	65,253	247
K Building	124	125		249	11,808	33
L Building	388	0		388	0	32
M Building	1,604	557		2,161	52,773	234
N Building	159	342		501	32,344	75
R1 Residence Building	1,149	904		2,053	85,599	260
R2 Residence Building	1,187	919		2,106	86,993	265
R3 Residence Building	1,148	940		2,088	89,017	266
SC Building	604	254		858	24,018	96
SUB Building	427	580		1,007	54,907	141
T Building	1,820	914		2,734	86,512	317
R4(12 Buildings)	552	674		1,226	63,785	168
Y Building	631	629		1,260	59,562	167
Z Building	1,278	1,656		2,934	156,811	407
LD-A Building	886	458		1,344	43,386	157
LD-B Building	1,851	2,412		4,263	228,377	592
2 Cuddy Warehouse	103	317		420	30,057	66
LR-A CCPV	419	424		843	40,143	112
Nelson Plaza	46	51		97	4,814	13
431 Richmond (LDXB)	78	36		114	3,414	13
Cuddy Farm	55	49		104	4,620	13
St Thomas Elgin Campus	776	624		1,400	59,073	178
Woodtsock/Oxford County Regional Campus	211	141		352	13,380	43
Woodstock/Oxford County Regional Campus	77	254		331	24,018	53
Elgin Mall (St. Thomas)	22	34		56	3,215	8
LC Sign	1	0		1	0	0
Oxbury plaza	221	0		221	0	18
London South Campus	647	244		891	23,143	98
London South Campus Sign	0	0		0	0	0
45 Metcallf (WCXJ)	0	41		41	3,856	7
Total	**28,968**	**23,530**	**219**	**52,717**	**2,228,230**	**6,679**

9. Appendix 3

9.1. 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.
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.

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