



ENERGY CONSERVATION & DEMAND MANAGEMENT PLAN

2024



L'HÔPITAL
DU DISTRICT DE
GERALDTON
DISTRICT
HOSPITAL
GERALDTON
OODENA AAKOZIIWIGAMIG

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1 Regulatory Update

O. Reg. 397/11: Conservation and Demand Management Plans was introduced in 2013. Under this regulation, public agencies were required to report on energy consumption and greenhouse gas (GHG) emissions and develop Conservation and Demand Management (CDM) plans the following year.

Until recently, O. Reg. 397/11 was housed under the Green Energy Act, 2009 (GEA). On December 7, 2018, the Ontario government passed Bill 34, Green Energy Repeal Act, 2018. The Bill repealed the GEA and all its underlying Regulations, including O. Reg. 397/11. However, it re-enacted various provisions of the GEA under the Electricity Act, 1998.

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

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

As of February 23, 2023, O. Reg. 507/18 was replaced by **O. Reg. 25/23, and BPS Reporting and ECDM Plans** are under the Electricity Act, 1998.

2 Executive Summary

The purpose of this Energy Conservation and Demand Management (ECDM) Plan from Geraldton District Hospital (“Geraldton”) is to outline specific actions and measures that will promote good stewardship of our environment and community resources in the years to come. The Plan will accomplish this, in part, by looking at future projections of energy consumption and reviewing past conservation measures.

In keeping with Geraldton’s core values of efficiency, concern for the environment and financial responsibility, this ECDM outlines how the hospital will reduce overall energy consumption, operating costs and greenhouse gas emissions. By following the measures outlined in this document, we will be able to provide compassionate service to more people in the community. This ECDM Plan is written in accordance with O. Reg. 25/23 of the recently amended Electricity Act, 1998.

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

- Energy Use Index (EUI) was 81.78 ekWh/ft²
- Energy-related emissions equaled 508 tCO₂e

To obtain full value from energy management activities, Geraldton 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, Geraldton can expect to achieve the following targets by 2029:

- 59% reduction in electricity consumption
- 40% reduction in natural gas consumption
- 57% reduction in GHG emissions

Geraldton District Hospital's Energy Performance and Path Forward

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

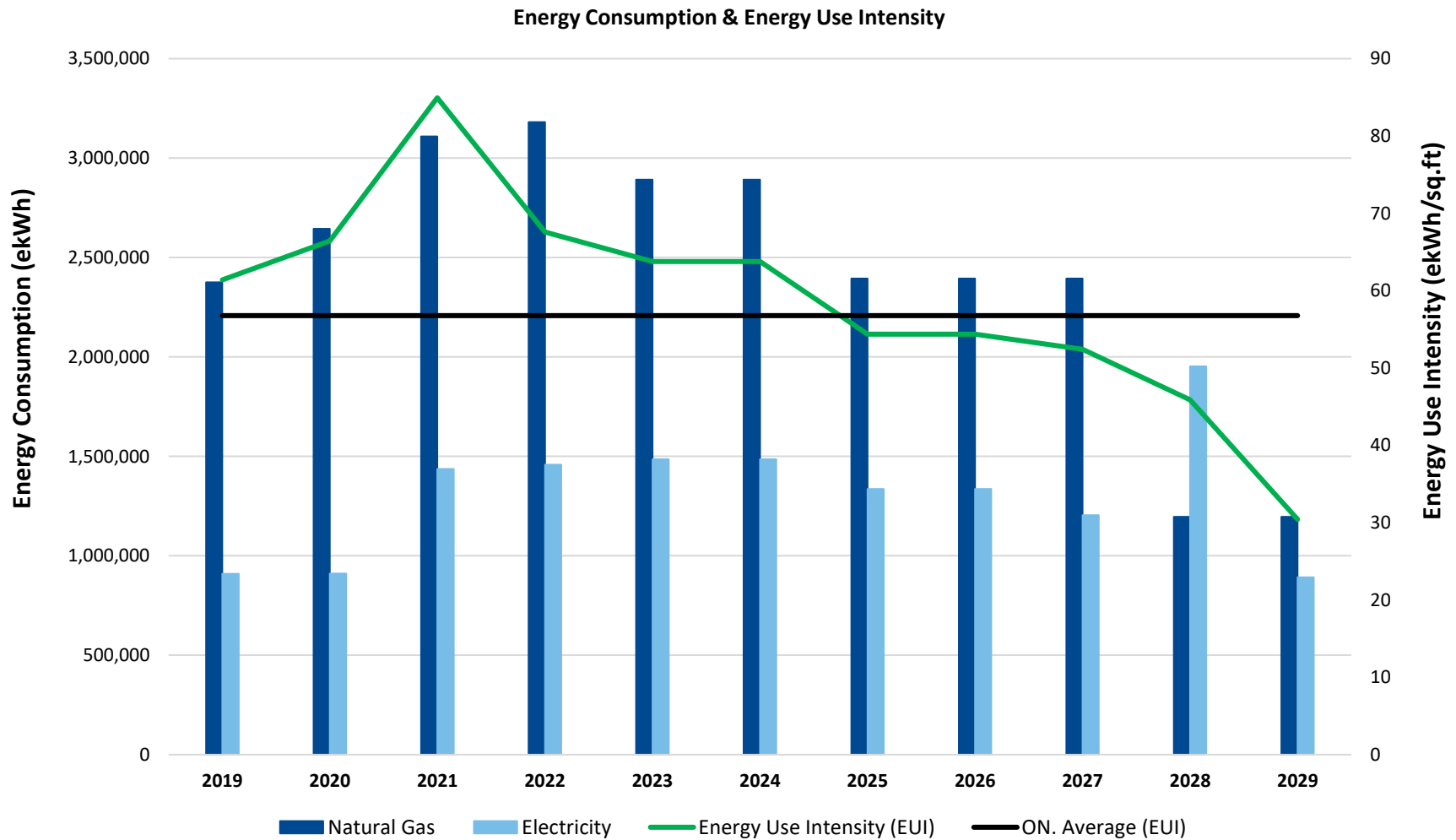


Figure 1. Energy Consumption Trends & Projections

3 About Geraldton District Hospital



Figure 2. Geraldton District Hospital

Geraldton District Hospital was built in 1963. We are a fully accredited facility with 23 acute care beds, 26 long-term care beds and a 24-hour emergency department. We provide many services including clinical nutrition, diagnostic imaging (x-ray & ultrasound), laboratory, outreach chemotherapy, rehabilitation (PT & OT), social work and telemedicine. We strive to ensure access to high quality health care and information to help build a healthier community.

| Facility Information | |
|--|------------------------------------|
| Facility Name | Geraldton District Hospital |
| Type of Facility | Healthcare Services |
| Address | 500 Hogarth Avenue, Geraldton, ON |
| Gross Area (Ft.²) | 68,632 |
| Average Operational Hours in a Week | 168 |
| Number of Beds | 49 |
| Number of Floors | 2 |

Table 1. Geraldton District Hospital Facility Information

In order to obtain full value from energy management activities, and to strengthen our conservation initiatives, a strategic approach must be taken. Our organization will strive to fully integrate energy management into our practices by considering indoor environmental quality, operational efficiency and sustainably sourced resources when making financial decisions.

Geraldton District Hospital views health care as a partnership between patients and their caregivers and is committed to providing a safe and healthy environment for clients, staff, volunteers and visitors. Our logo was constructed with our mission in mind – the color white symbolizes purity and is the international colour used by persons in the field of medicine; the different blues symbolize the blue water and the blue sky; the tree symbolizes the tree of life and the geographical region the hospital serves; and the circle symbolizes a protective space.

Geraldton District Hospital is a progressive health care organization committed to providing high quality services. We serve the residents of Greenstone (Geraldton, Longlac, Nakina, Beardmore, Caramat) and surrounding First Nations communities. We strive to continuously change and grow to meet the needs of our community. We are committed to healthy living and quality of care and are inspired by our patients.

Our Mission

We are committed to delivering Quality, Coordinated, Patient and Family Centered Care

Our Vision

Partnering for a Healthier Community

Our Values

- **Respect:** We respect and promote the dignity of each individual
- **Excellence:** As a team we provide quality inspired and seamless care to our patients/residents and their families
- **Accountability:** We are accountable to the communities we serve through ensuring that available resources are utilized efficiently and appropriately

MISSION, VISION AND VALUES

Our Mission, Vision & Values were developed through a collaborative approach that included engagement directly from the members of our community, as well as our fellow stakeholders.

Figure 3. Geraldton Mission, Vision, Values

4 Historical Analysis

4.1 Historical Energy Intensity

Energy Utilization Index is a measure of how much energy a facility uses per square foot. By breaking down a facility’s energy consumption on a per-square-foot-basis, we can compare facilities of different sizes with ease. In this case, we are comparing our facility to the industry average for Ontario hospitals (derived from Natural Resources Canada’s Commercial and Institutional Consumption of Energy Survey), which was found to be 56.77 ekWh/sq. ft.

| Year | 2019 | 2020 | 2021 | 2022 | 2023 |
|-----------------------------|-------|-------|-------|-------|-------|
| Geraldton District Hospital | 61.38 | 66.43 | 84.94 | 67.60 | 63.77 |

Table 2. Historic Energy Intensity

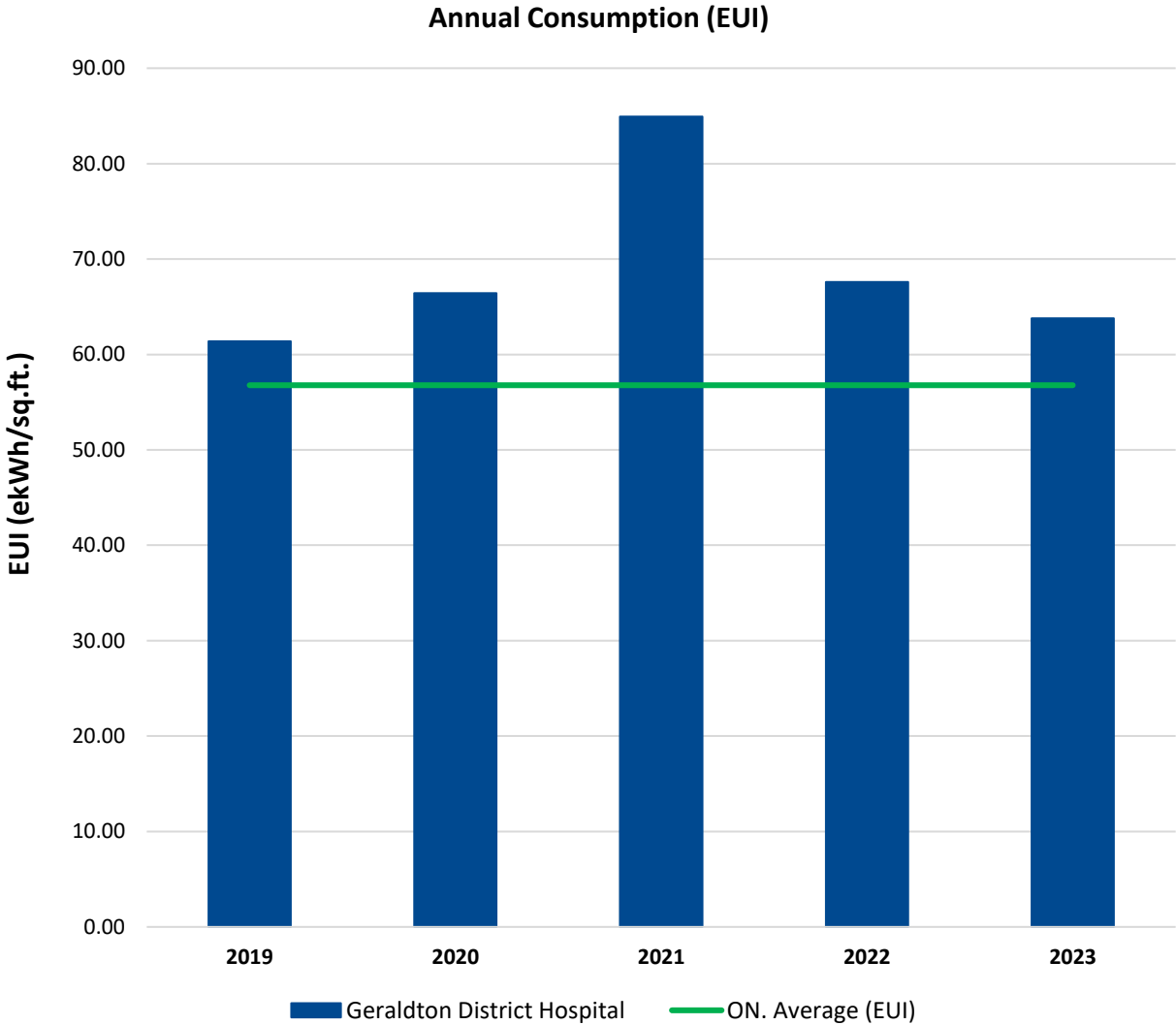


Figure 4. Historic Energy Intensity

4.2 Utility Consumption Analysis

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

| Year | 2019 | 2020 | 2021 | 2022 | 2023 |
|-------------------------------|---------|---------|-----------|-----------|-----------|
| Electricity (kWh) | 909,640 | 911,533 | 1,436,596 | 1,458,205 | 1,485,107 |
| Natural Gas (m ³) | 224,951 | 250,361 | 294,469 | 301,239 | 273,843 |

Table 3. Historic Annual Utility Consumption

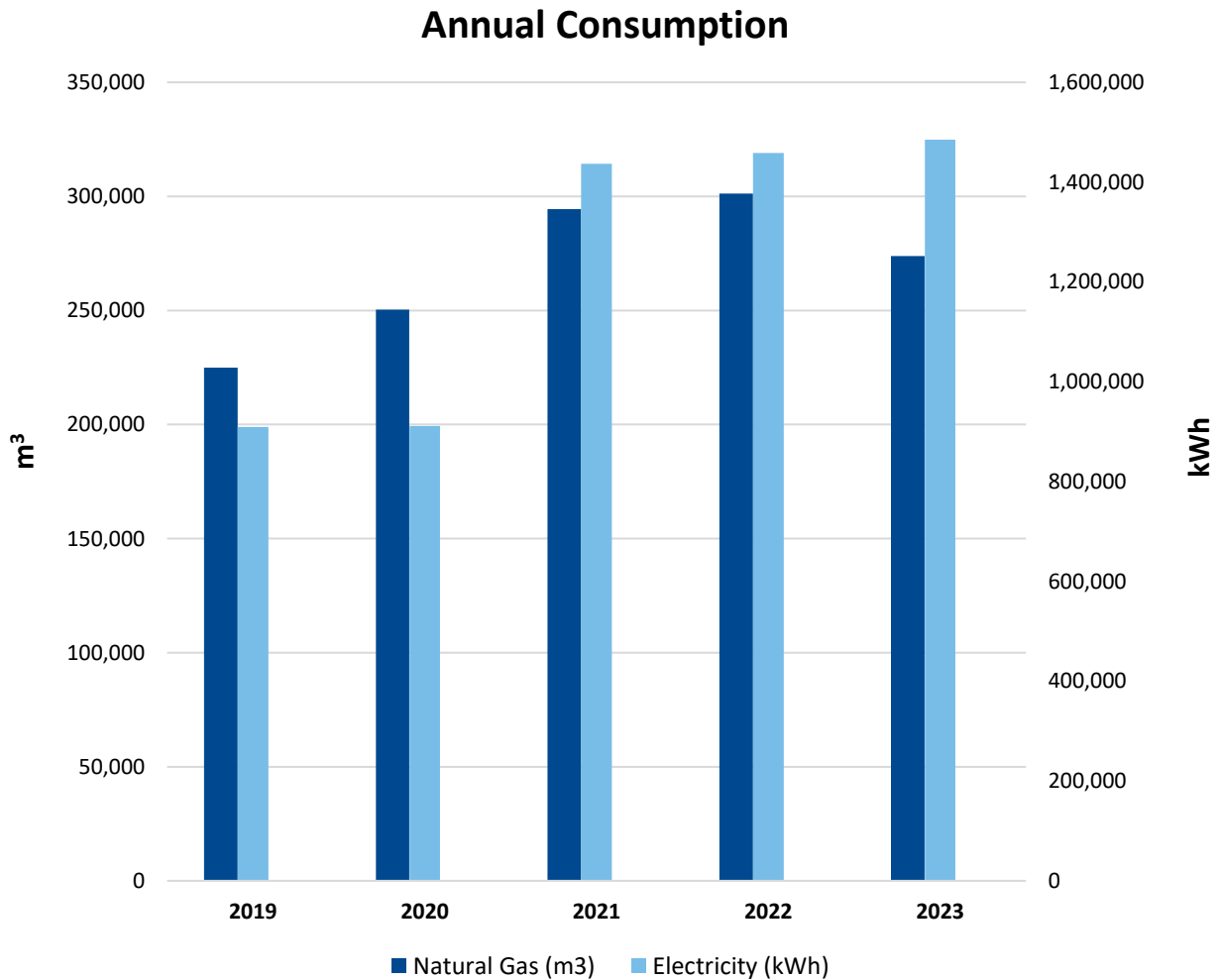


Figure 5. Historic Annual Utility Consumption

4.3 GHG Emissions Analysis

Greenhouse gas (GHG) emissions are expressed in terms of equivalent tonnes of carbon dioxide (tCO₂e). The GHG emissions associated with a facility are dependent on the fuel source — for example, hydroelectricity produces fewer greenhouse gases than coal-fired plants, and light fuel oil produces fewer GHGs than heavy oil.

Electricity from the grid in Ontario is relatively “clean”, as the majority is derived from low-GHG hydroelectricity, and coal-fired plants have been phased out. Scope 1 (natural gas) and Scope 2 (electricity) consumptions have been converted to their equivalent tonnes of greenhouse gas emissions in the table below. Scope 1 represents the direct emissions from sources owned or controlled by the institution, and Scope 2 consists of indirect emissions from the consumption of purchased energy generated upstream from the institution.

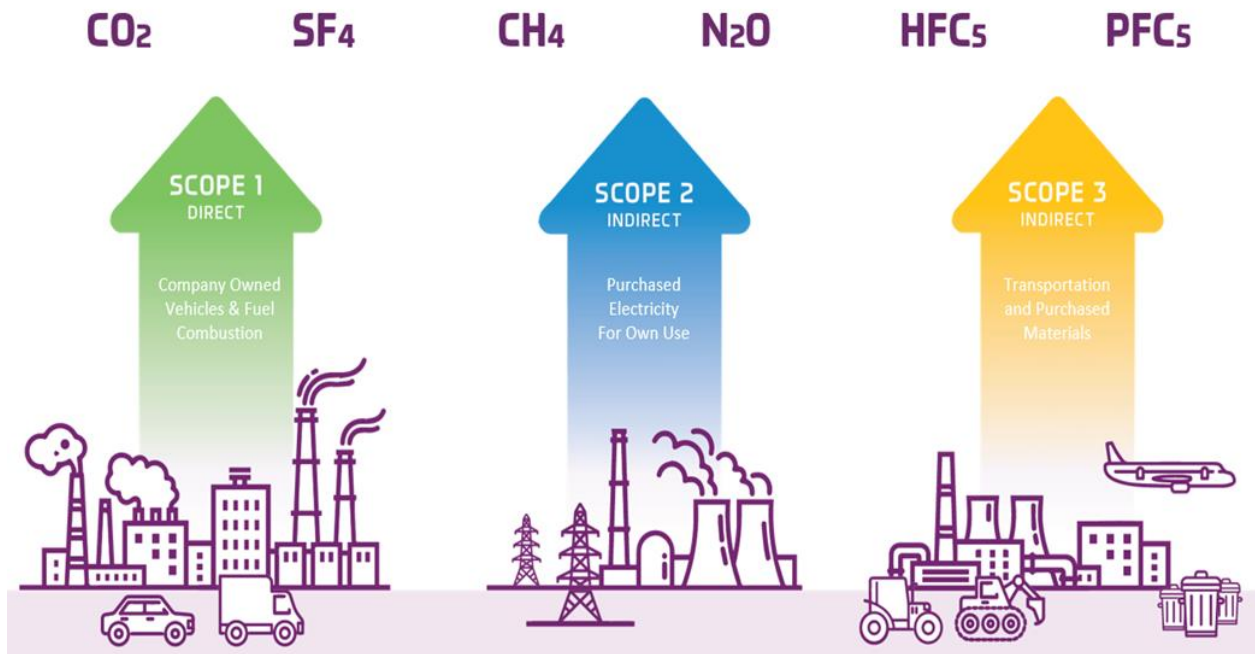


Figure 6. Examples of Scope 1 and 2

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

| GHG Emissions (tCO ₂ e) | 2019 | 2020 | 2021 | 2022 | 2023 |
|------------------------------------|------|------|------|------|------|
| Natural Gas (Scope 1) | 432 | 481 | 566 | 579 | 526 |
| Electricity (Scope 2) | 23 | 24 | 38 | 103 | 123 |
| Totals | 598 | 382 | 465 | 451 | 508 |

Table 4. Historic Greenhouse Gas Emissions

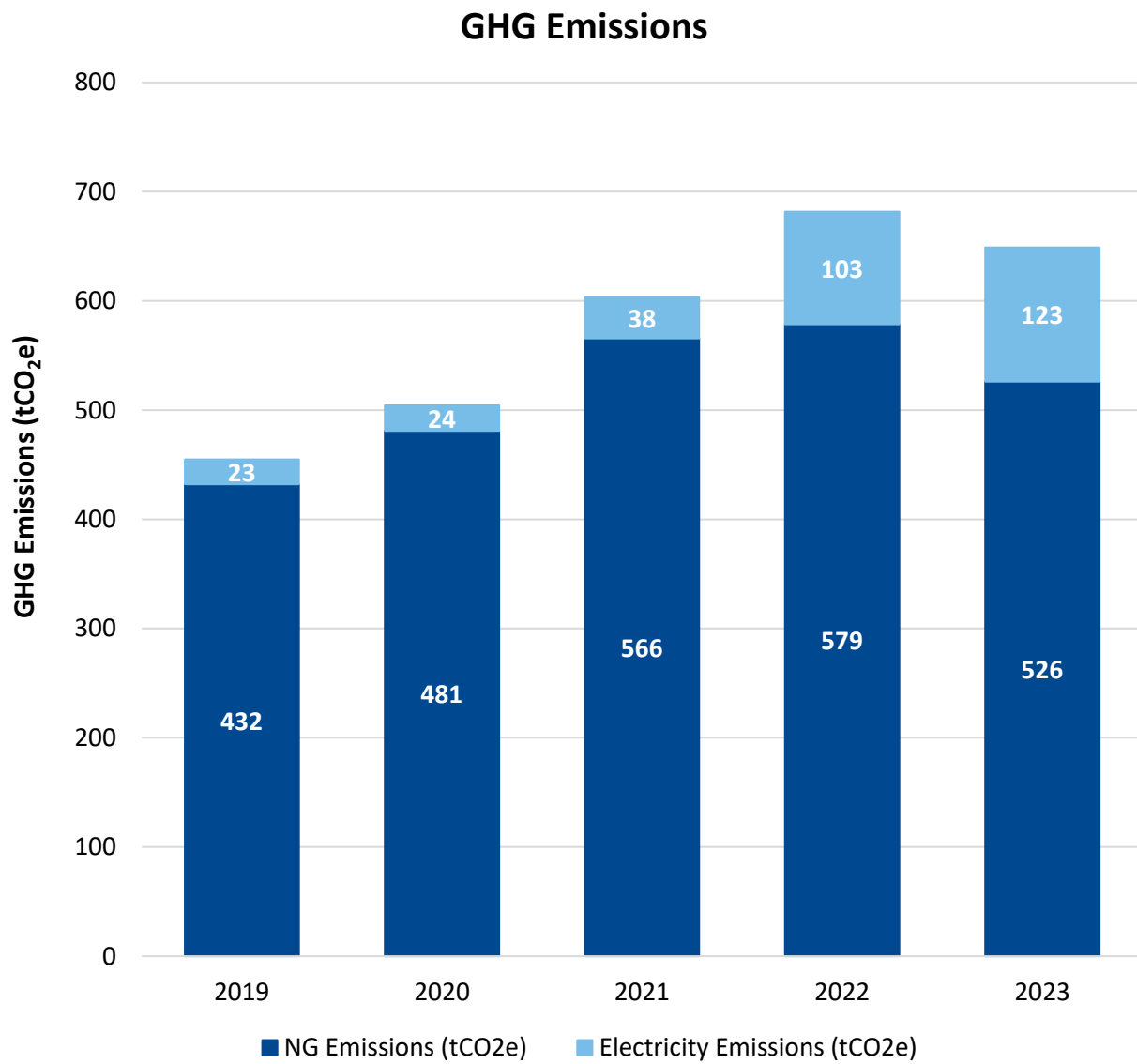


Figure 7. Historic Greenhouse Gas Emissions

5 Measures

5.1 Energy Conservation and GHG Reduction Strategies to Date

Over the previous years, Geraldton District Hospital has undertaken various energy conservation and demand management measures. The summary of the main activities is shown in the following table.

| Measure Name | Scope/Results |
|--|--|
| New Emergency department with all new air handling units, boilers, chiller, etc. | These measures have resulted in more energy efficient and reliable operations, reductions in GHG emissions and reductions in energy use. |
| New Fulton Steam Boiler for sterilization and MDRD | |
| LED Lighting retrofit | |
| New MDRD Washer | |
| New Sump Pumps | |

Table 5. Previously Implemented Measures and Initiatives

5.2 Proposed Energy Conservation and GHG Reduction Measures

Our energy analysis has revealed several conservation strategies for the facility. Geraldton'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 (\$) | | | |
| LED Lighting Retrofit | 10,715 | -51 | \$1,364 | \$10,495 | 7.7 | 2025 |
| BAS RCx and blackPAC Installation | 138,102 | 47,090 | \$37,150 | \$588,115 | 15.8 | 2025 |
| ASHP Installation | -749,102 | 113,500 | -\$38,615 | \$1,923,926 | N/A | 2028 |
| Install 115kW Rooftop Solar PV | 132,480 | 0 | \$17,116 | \$253,000 | 14.8 | 2027 |
| Install 930 kW ground Mount PV | 1,061,100 | 0 | \$137,094 | \$2,557,500 | 18.7 | 2029 |
| Total | 593,295 | 160,539 | \$154,109 | \$5,333,037 | 34.6 | - |

Table 6. Proposed Conservation Measures

6 Geraldton District Hospital Outlook

6.1 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 (m ³) | 273,843 | 0% | 226,804 | 17% | 226,804 | 17% | 226,804 | 17% | 113,304 | 59% | 113,304 | 59% |
| Electricity (kWh) | 1,485,107 | 0% | 1,336,290 | 10% | 1,336,290 | 10% | 1,203,810 | 19% | 1,952,912 | -31% | 891,812 | 40% |

Table 7. Forecast for Annual Utility Consumption

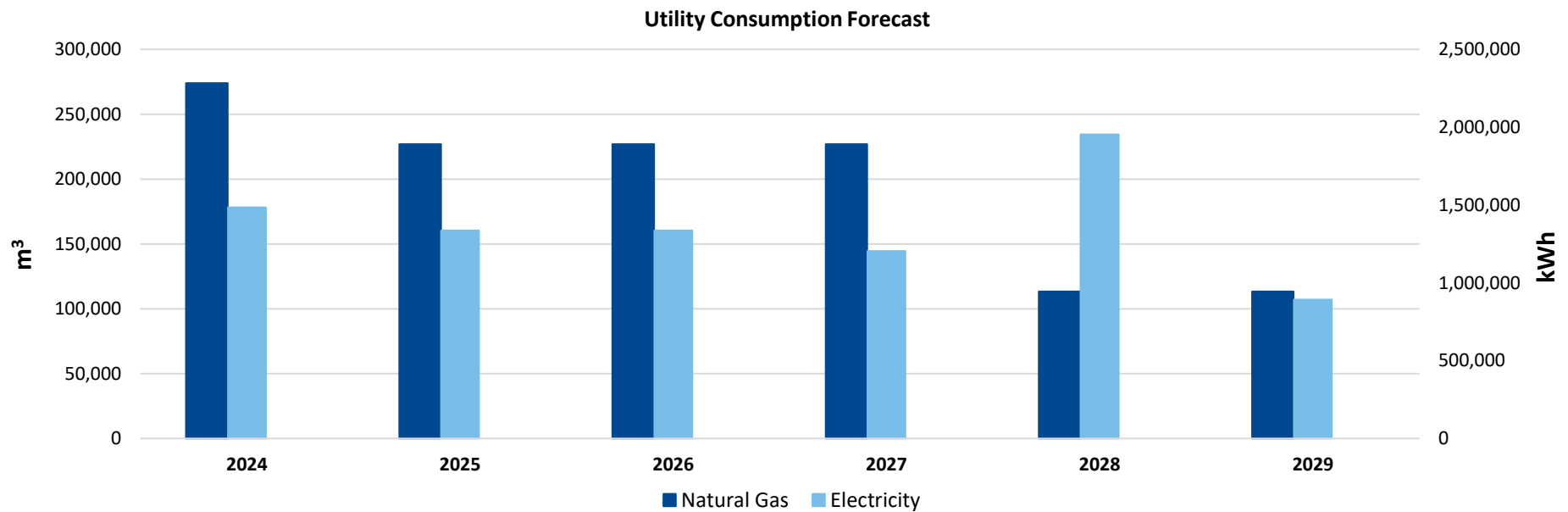


Figure 8. Forecast for Annual Utility Consumption

6.2 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) | 526 | 436 | 436 | 436 | 218 | 218 |
| Electricity (scope 2) | 97 | 117 | 102 | 105 | 147 | 62 |
| Totals | 623 | 553 | 538 | 541 | 365 | 279 |
| Reduction from Baseline Year | 4% | 15% | 17% | 17% | 44% | 57% |

Table 8. Forecast for Annual Greenhouse Gas Emissions

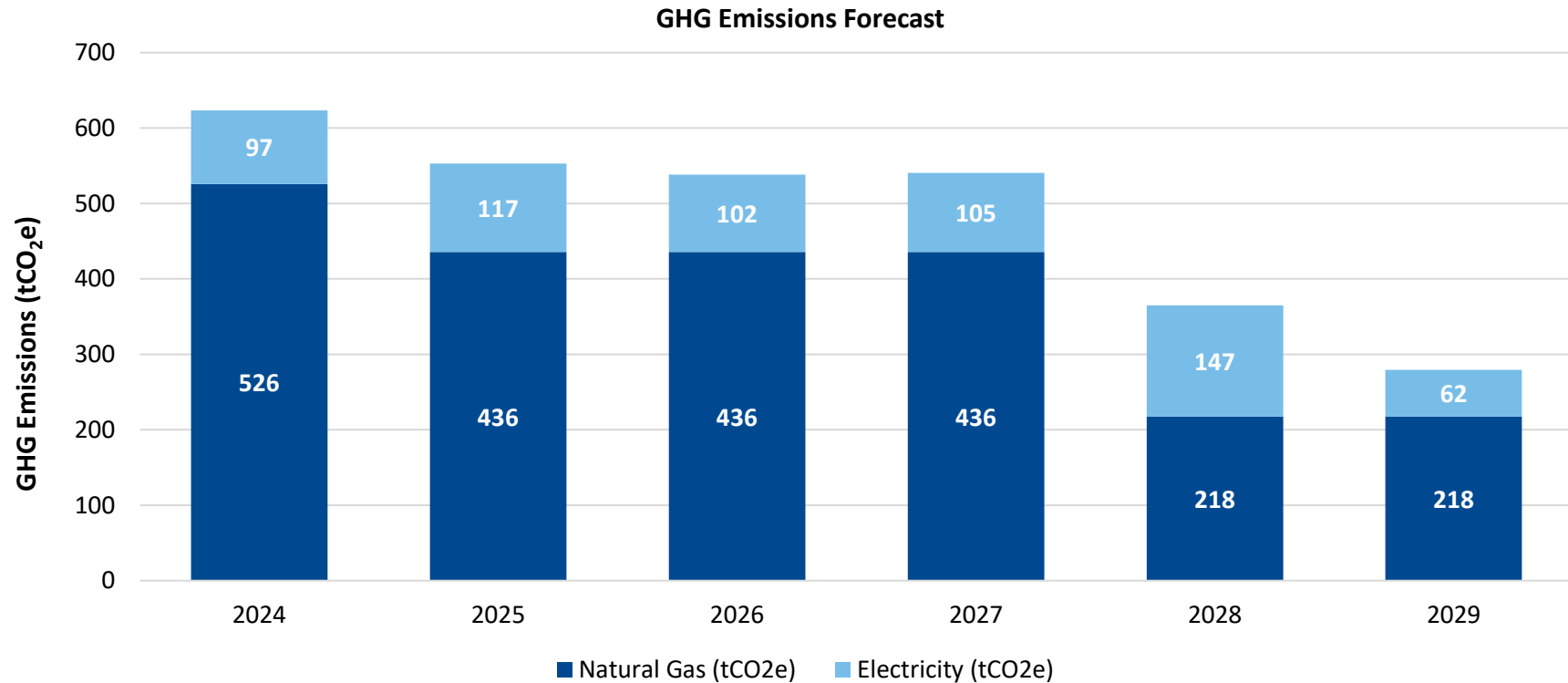


Figure 9. Forecast for Annual Greenhouse Gas Emissions

7 Closing Comments

Thank you to all who contributed to Geraldton District Hospital's Energy Conservation & Demand Management Plan. We consider our facility a primary source of care, and an integral part of the local community. The key to this relationship is being able to use our facilities efficiently and effectively to maximize our ability to provide the highest quality of healthcare services while integrating environmental stewardship into all aspects of facility operations.

On behalf of the senior management team here at Geraldton District Hospital, we approve this Energy Conservation & Demand Management Plan.

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This ECDM plan was created through a collaborative effort between Geraldton District Hospital 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. |
| Greenhouse Gas | GHG | Greenhouse gas means a gas that contributes to the greenhouse effect by absorbing infrared radiation, e.g., carbon dioxide and chlorofluorocarbons. |
| Metric Tonnes | t | Metric tonnes are a unit of measurement. 1 metric tonne = 1000 kilograms |
| Net Zero | | A net-zero energy building, is a <u>building</u> with zero net <u>energy consumption</u> , meaning the total amount of energy used by the building on an annual basis is roughly equal to the amount of <u>renewable energy</u> created on the site, |
| Variable Frequency Drive | VFD | A variable frequency drive is a device that allows for the modulation of an electrical or mechanical piece of equipment. |

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