

2024
Niagara Health
Energy Conservation & Demand Management Plan

niagarahealth

Extraordinary Caring. Every Person. Every Time.

Table of Contents

| | | |
|--------------|--|-----------|
| 1 | Energy Conservation & Demand Management Plan – Overview | 4 |
| 2 | Introduction | 5 |
| 3 | Building Survey | 6 |
| 3.1 | St. Catharines Hospital | 6 |
| 3.2 | Welland Hospital | 7 |
| 3.3 | Greater Niagara General Hospital | 8 |
| 3.4 | Douglas Memorial Hospital | 9 |
| 3.5 | Port Colborne General Hospital | 10 |
| 4 | Energy and Utility Overview | 11 |
| 4.1 | Energy Consumption | 11 |
| 4.2 | Energy Cost | 12 |
| 4.3 | Past Project Summary | 13 |
| 4.3.1 | Douglas Memorial Hospital | 13 |
| 4.3.2 | Greater Niagara General Hospital | 13 |
| 4.3.3 | Port Colborne General Hospital | 13 |
| 4.3.4 | St. Catharines Site | 13 |
| 4.3.5 | Welland Hospital Site | 14 |
| 5 | 2024 Energy Conservation & Demand Management Plan Goals and Results | 15 |
| 5.1 | Conservation & Demand Management Plan Approval, Resources to Implement | 15 |
| 5.2 | Implement Financial Practices and Decision Making Processes | 15 |
| 5.3 | Establish Purchasing Specifications for Energy Efficient Equipment and Services | 15 |
| 5.4 | Implement Enhanced Design and Construction (D&C) Practices | 15 |
| 5.5 | Improve Building Operating Performance | 15 |
| 5.6 | Implement Cost –Effective Facility Upgrades | 16 |
| 5.7 | Actively Manage Energy Commodities | 16 |
| 6 | Energy Intensity and Emissions | 17 |
| 6.1 | Energy Intensity | 17 |
| 6.2 | Green House Gas Emissions | 17 |
| 7 | Energy Conservation & Demand Management Plan Goals | 18 |
| 7.1 | Goal: Receive Support for Future Projects | 18 |
| 7.2 | Goal: Increase the Frequency of Environmental Initiative Programing | 18 |
| 7.3 | Goal: Improve Building Operating Performance | 18 |

| | | |
|-----|---|----|
| 7.4 | Goal: Monitor and Track Progress | 18 |
| 7.5 | Goal: Implement Cost-Effective Facility Upgrades..... | 18 |
| 8 | Closing Comments | 18 |

1 Energy Conservation & Demand Management Plan – Overview

Originally created under Ontario’s Green Energy Act, the Energy Conservation & Demand Management Plans (ECDMP) now fall under the Electricity Act and Ontario Regulation 507/18 – Broader Public Sector: Energy Reporting and Conservation and Demand Management Plans. This ensures that targets are met, that this plan offers a comprehensive understanding of how Niagara Health has progressed over the past 5 years, and the vision Niagara Health has for the future.

Promoting Energy Conservation

Not only does energy conservation decrease costs associated with energy usage, it also decreases the demand on the electrical systems. This is particularly important, as Ontario has seen an increase in prolonged heat warnings, leading to intense strain on the province’s electrical system. With each energy conservation measure, the potential for blackouts associated with these strains during hot weather also decreases. This decrease in electrical demand, coupled with a decrease in natural gas demand will lead to a decrease in greenhouse gas emissions and overall costs to the organization.

Since the previously named *Conservation & Demand Management Plan* was first introduced, Ontario has made strides in decreasing the environmental footprint of the province. This is being achieved by a combination of measures, including:

- Switching to more sustainable electricity generation, primarily hydroelectricity.
- Improving the standard of efficiency in new appliances and buildings.
- Creating the *Save On Energy* program under the IESO, which promotes energy efficient upgrades through the offering of monetary incentives.

2 Introduction

Niagara Health (NH) is a regional health system consisting of five hospitals serving over 450,000 residents across the Niagara Region. With a wide range of services across our sites, Niagara Health is able to deliver extraordinary care to every patient that enters our facilities.

The purpose of this plan is to promote and maintain environmental stewardship in the local communities, and better identify and allocate resources in order to achieve ambitious results. In keeping with our CORE values of *Compassion in Action*, *Driven by Optimism*, *Achieving Ambitious Results*, and being *Extraordinary*, Niagara Health will aim to reduce our energy consumption while promoting social responsibility to over 4,800 staff members and the community.

To obtain full value from this plan and all energy management activities, a strategic approach will be taken. This will include the consultation of Facilities Management, a review of simple return on investments, the projected lifespans of projects, and the future construction of a new Niagara South Hospital. This is all intended to provide the most efficient use of resources to better suit Niagara Health.

3 Building Survey

3.1 St. Catharines Hospital

The St. Catharines Hospital is the newest Niagara Health facility and the headquarters for all administrative operatives. This site is home to Niagara’s leading cancer clinic, the Walker Family Cancer Centre, the Women’s and Children’s unit, mental health services, and much more.

| St. Catharines Hospital | |
|-------------------------|--|
| Address | 1200 Fourth Avenue, St. Catharines, ON |
| Acronym | SCS |
| Size (ft ²) | 983,000.00 |
| Year Build | 2013 |
| Beds | 419 |
| Emergency Service Type | Emergency Department |



3.2 Welland Hospital

The Welland Hospital is Niagara Health's second largest facility, located in the heart of the Niagara Region. With services ranging from the Niagara Diabetes Centre, to the Region's primary Extended Care Unit, Welland services a large population.

| Welland Hospital | |
|-------------------------|------------------------------|
| Address | 63 Third Street, Welland, ON |
| Acronym | WHS |
| Size (ft ²) | 405,000.00 |
| Year Build | 1958 |
| Beds | 316 |
| Emergency Service Type | Emergency Department |



3.3 Greater Niagara General Hospital

The Greater Niagara General is located in the tourism driven municipality of Niagara Falls. As such, this hospital caters to individuals from around the world and is able to provide services ranging from day surgery, diagnostic imaging, to regional stroke services.

| Greater Niagara General Hospital | |
|----------------------------------|--------------------------------------|
| Address | 5546 Portage Road, Niagara Falls, ON |
| Acronym | GNG |
| Size (ft ²) | 333,773.00 |
| Year Build | 1958 |
| Beds | 215 |
| Emergency Service Type | Emergency Department |



3.4 Douglas Memorial Hospital

Located in the border community of Fort Erie, DMH often serves patients who are visiting from outside of the community. It is one of Niagara Health's small community hospitals along the shores of Lake Erie, but is still able to provide Urgent Care, and a Complex Care Unit.

| Douglas Memorial Hospital | |
|---------------------------|----------------------------------|
| Address | 230 Bertie Street, Fort Erie, ON |
| Acronym | DMH |
| Size (ft ²) | 94,149.00 |
| Year Build | 1931 |
| Beds | 50 |
| Emergency Service Type | Urgent Care Clinic |



3.5 Port Colborne General Hospital

This hospital is located along in southern Niagara along the shores of Lake Erie. As Niagara Health's smallest site, it still provides Urgent Care, a Complex Care Unit, and Niagara Health's addiction clinic, the New Port Centre.

| Port Colborne General Hospital | |
|--------------------------------|---|
| Address | 260 Sugarloaf Street, Port Colborne, ON |
| Acronym | PCG |
| Size (ft ²) | 37,774.00 |
| Year Build | 1951 |
| Beds | 61 |
| Emergency Service Type | Urgent Care Clinic |



4 Energy and Utility Overview

4.1 Energy Consumption

Hospitals are among the highest energy consumers in the public sector due to the nature of their facilities and being in use 24 hours a day. Knowing and understand energy consumption can help the organization make informed decisions and identify conservation opportunities (excluding water).

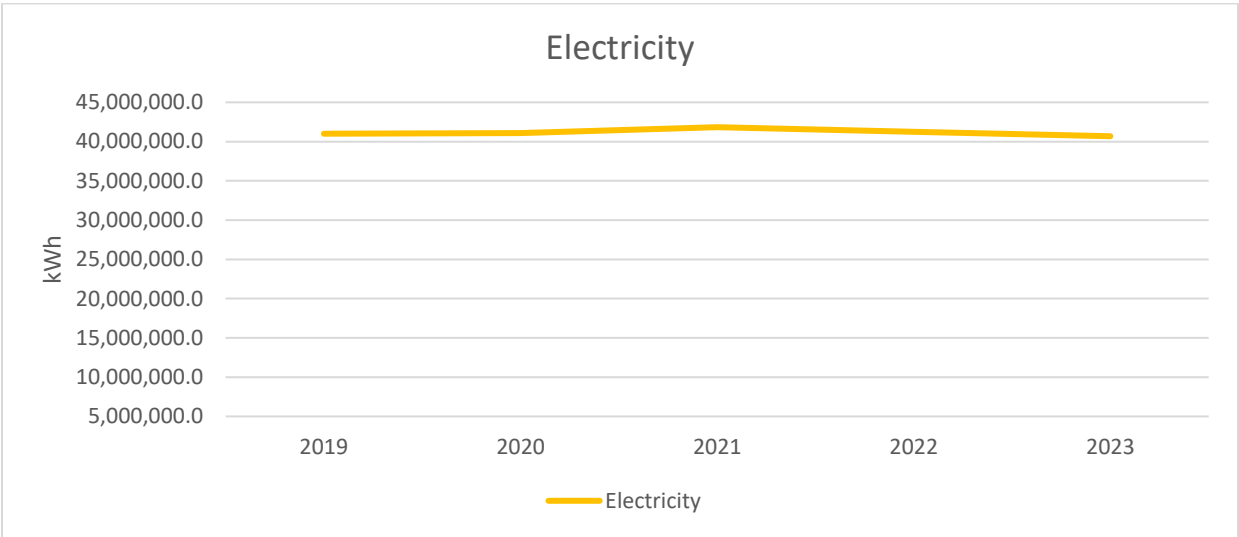


Figure 1: Electricity consumption at Niagara Health between 2019 and 2023

Between 2019 and 2023, Niagara Health saw an decrease of approximately 305,000 kWh. There continues to be improvements to the energy efficiency of Niagara Health’s buildings through various retrofit projects.

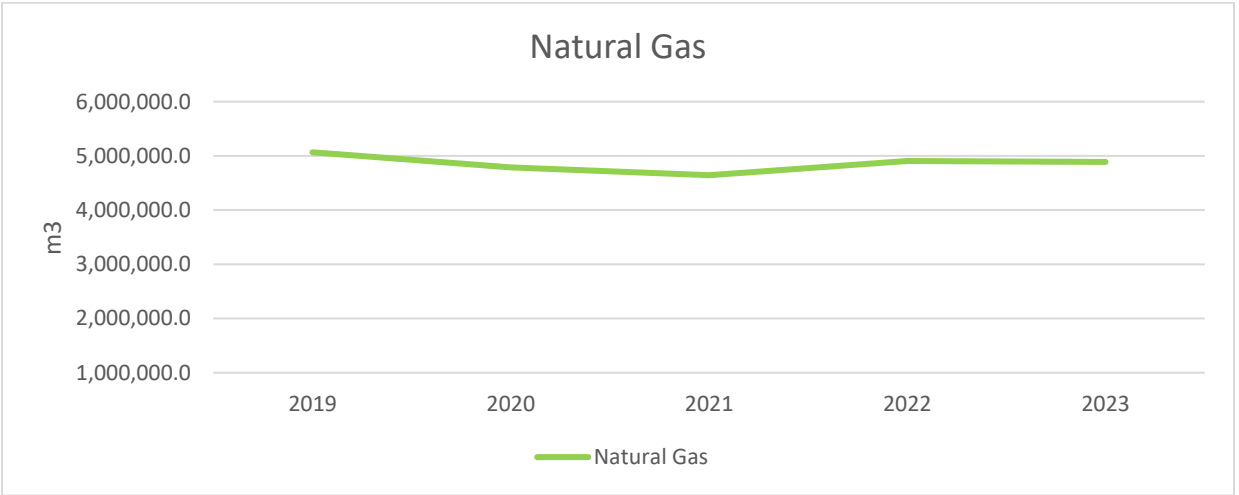


Figure 2: Natural Gas costs at all Niagara Health sites between 2014 and 2018

Between 2019 and 2023, Niagara Health saw a decrease in natural gas consumption of approximately 175,000 m³. This can be attributed to improvements in building and equipment efficiencies.

4.2 Energy Cost

In addition to having an inherent social responsibility to the community to decrease energy consumption, there is also a monetary component to it. As Niagara Health decreases energy consumption, the organization will incur lower utility costs, which can then be spent in patient areas or on patient care. For this plan the utilities and their costs under review are electricity and natural gas. All values shown will be the cost of delivery and total consumption prior to provincial and federal tax.

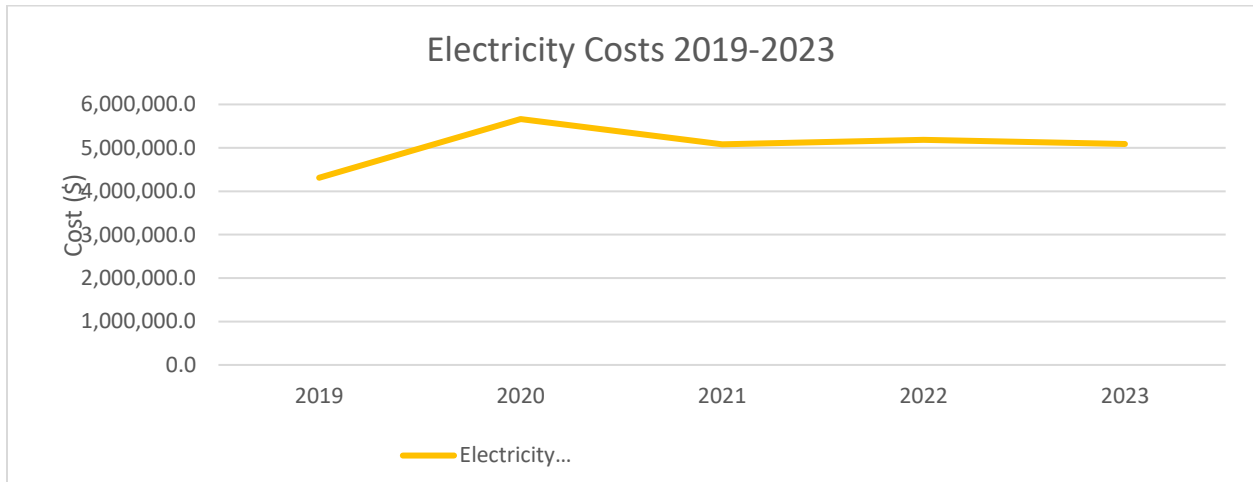


Figure 3: Electricity costs for Niagara Health between 2019 and 2023

The cost of Niagara Health’s electricity from 2019 to 2023 was incredibly similar to the past reporting period, averaging \$5,064,805.50 per year. There is a slight increase in electricity cost in 2020 that is being attributed to a warmer than average summer; requiring air conditioning units and chillers to run at higher than normal capacities.

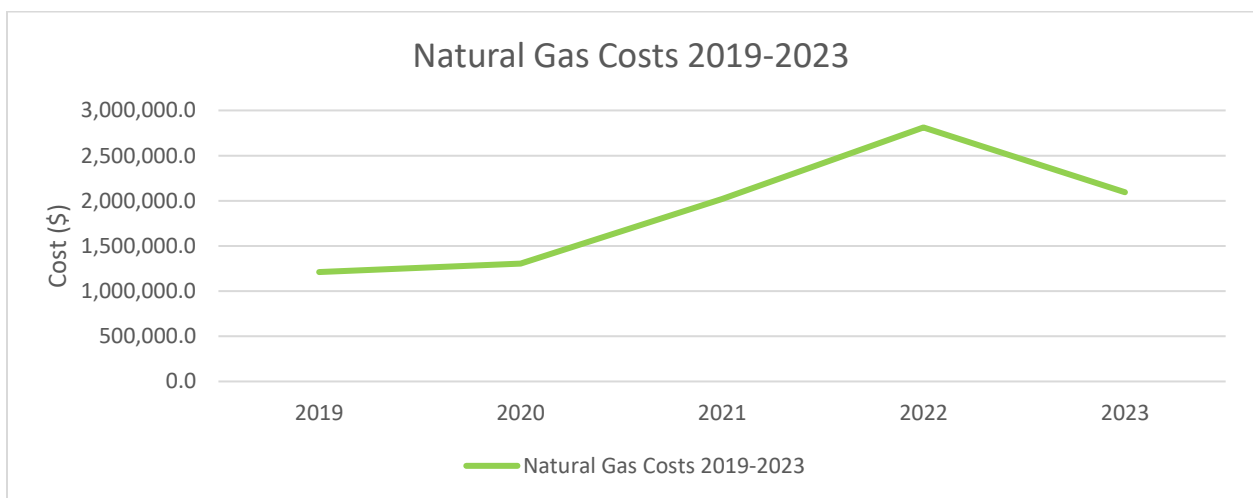


Figure 4: Natural gas costs for Niagara Health between 2014 and 2018

Between 2019 and 2023, Niagara Health increased the amount spent on natural gas from \$1,211,176 to \$2,094,416. This increase in cost can be attributed to colder than normal winters, including the historic Christmas Blizzard of 2022, resulting in higher natural gas consumption.

4.3 Past Project Summary

Niagara Health understands that there is the potential for documented energy savings with many of the projects that occur on a regular basis, as well as those that may not appear to have an energy related component. When possible, projects are tracked and details of project cost, assumed savings and return on investments are recorded. Not only is this vital to ensure transparency, it also allows a direct comparison to annual electricity and natural gas consumption to determine if there are noticeable decreases.

It has been found that not all projects will have a noticeable impact, as the volume of service Niagara Health provides has increased over time. In these cases, it is assumed that the reduction in energy usage has offset the increases that resulted from increased services. This still indicates that the energy savings are effective and will continue to be in place going forward.

4.3.1 Douglas Memorial Hospital

Douglas Memorial Hospital has had extensive lighting retrofits over the past several years. This includes replacing the majority of the fluorescent lights inside with LED, and upgrading all of the exterior lighting to LED. Site wide window film was installed to help with heat load in 2019 and an elevator modernization occurred in 2023 as well as a final T12 lighting retrofit.

4.3.2 Greater Niagara General Hospital

The Greater Niagara General Hospital has completed several projects over the past several years in order to decrease the building's energy consumption. Of all of the projects, that with the largest scope was the replacement of fluorescent bulbs with LED bulbs, both throughout the interior and the exterior. There has been an upgrade to the OR humidifier and the MRI chiller as well as a core lab cooling upgrade, cooling tower refurbish and window replacements.

4.3.3 Port Colborne General Hospital

Over the past several years, Port Colborne has had an extensive lighting retrofitting across the site. This included the majority of interior lights, as well as through on the exterior of the building and in the parking lots. In 2021, upgrades were made to the aging chiller plant was replaced and obsolete water-cooled AC units were replaced as well as newer, more energy efficient PTAC units replaced obsolete units at our Newport Centre from 2019-2022.

4.3.4 St. Catharines Site

St. Catharines was constructed with energy efficiency in mind. It was among the first hospitals in Ontario to be a LEED certified and thus has always maintained below-average energy consumption. This was done through a variety of initiatives including passive solar light throughout patient rooms, a Building Automation System (BAS), and the installation of efficient building equipment.

4.3.5 Welland Hospital Site

As with all of the legacy sites, Welland has retrofitted the majority of all interior and exterior light bulbs with LED. Any that have not yet been replaced are currently in progress to be replaced as rooms become available. There have been upgrades to replace aged AC units and air handlers throughout the site as well as a final T12 retrofit for lighting. Welland continues to focus on energy savings improvements throughout the upcoming redevelopment.

5 2024 Energy Conservation & Demand Management Plan Goals and Results

5.1 Conservation & Demand Management Plan Approval, Resources to Implement

In 2014, the CDM Plan had a primary goal of being approved by the appropriate levels of management at Niagara Health, which occurred. Since then there have been resources put in place and staff trained in order to continue the implementation of various goals and objects previously identified. This continues to grow and be implemented with each year, while being mindful that the new South Niagara hospital will be opening in 2028.

5.2 Implement Financial Practices and Decision Making Processes

Since the implementation of the 2014 plan, an emphasis has been placed on investing in energy efficient infrastructure, as well as identifying when and where savings occur and capturing their assumed value. Using project costs and assumed savings through energy reduction, staff are able to calculate a basic return on investment (ROI), and from there can determine if a project fits into Niagara Health's current strategic plan. This continues while being mindful that the new South Niagara hospital will be opening in 2028.

5.3 Establish Purchasing Specifications for Energy Efficient Equipment and Services

Although identified as a previous goal, there has been no specific implementation of a plan to prioritize the purchasing of energy efficient equipment and services. Despite there being no formal plan in place, the Energy Star ratings do factor in to the overall decision to purchase or not purchase an item or service. For all infrastructure improvements, emphasis is placed on purchasing energy efficient items (i.e. LED lighting, HVAC systems with variable frequency drives and occupancy sensors, etc.). There is opportunity for continuous growth within this goal.

5.4 Implement Enhanced Design and Construction (D&C) Practices

No formal plan has been implemented in order to achieve this goal. Staff will continue to work with design and construction firms and place an emphasis on energy efficient improvements.

As of the writing of this report, the design process of the new Niagara Falls hospital is underway, and there is currently a focus on energy performance targets for the building pre and post-construction.

5.5 Improve Building Operating Performance

Niagara Health set a goal of having measured changes in our operating performance.

Goal of continuing to reduce utility operating costs by an average of 5% between 2019 and 2023

- Between 2019 and 2023 the operating costs accrued through the purchasing of electricity and natural gas increased from \$6,277,648 to \$6,985,149. This is an increase of \$707,500. Energy costs have risen and services have increased.

Reduce the system-wide EI from 325.59 ekWh/ft² in to 275 ekWh/ft².

- The previous system wide EI was last calculated in 2012 and included aged and energy intense buildings that are no longer part of Niagara Health, and a LEED Certified replacement building. Due to the removal of aged buildings and the inclusion of a LEED certified building, the most recent system-wide EI is 46.24 ekWh/ft².

Reduce energy consumption by 500,000 kWh/ year (2,500,000 kWh total)

- Between 2019 and 2023, Niagara Health decreased kWh consumption from 40,987,209 kWh to 40,682,441 kWh. This is a decrease of 304,768 kWh. Even though the decrease is positive, it results in this goal not being met, again as energy costs and services have increased.

Improve Energy Star rating

- Niagara Health does not currently use an Energy Star rating system.

5.6 Implement Cost –Effective Facility Upgrades

Niagara Health had the goal of using life-cycle analysis to justify equipment and system upgrades and improvements. Currently an approximate ROI is calculated in order to determine if a large equipment or system upgrade can be rationalized in order to fit with Niagara Health's strategic plan and 5-year goals. Although this is not a full life-cycle analysis, it aides in the decision making process.

5.7 Actively Manage Energy Commodities

As outlined in the 2019 plan, Niagara Health had a goal of managing and monitoring energy consumption across the health system. This has been done through a variety of methods outlined below:

- Monthly data input of all utility bills (consumption and cost)
- Annually reporting energy usage through the Broader Public Sector (Portfolio Manager) reporting portal
- Annually reporting energy consumption to Greening Healthcare in the form of the Ontario Hospital Scorecard

6 Energy Intensity and Emissions

6.1 Energy Intensity

In order to accurately determine the efficiency of Niagara Health’s buildings, the Energy Intensity (EI) was calculated based on the equivalent kilowatt-hours (ekWh) consumed by square footage. This provides a value that can be directly compared to similar organizations, and already takes into account the total geographic footprint of the building.

The EI is determined by combining electricity consumption (kWh) and converting natural gas consumption (m³) into ekWh. The combined total ekWh is then dividing by the facility’s floor space.

6.2 Green House Gas Emissions

Greenhouse Gas emissions are a measure of the equivalent tons of carbon dioxide (T CO₂^e) emissions that are generated by the consumption of various energy sources used to run the hospitals. These emissions directly contribute to climate change. Typically Greenhouse Gas emissions are created using scope 1 (natural gas), scope 2 (electricity), and scope 3 (water) usage. As this report focuses on energy used by Niagara Health, the emissions are created using scope 1 and scope 2.

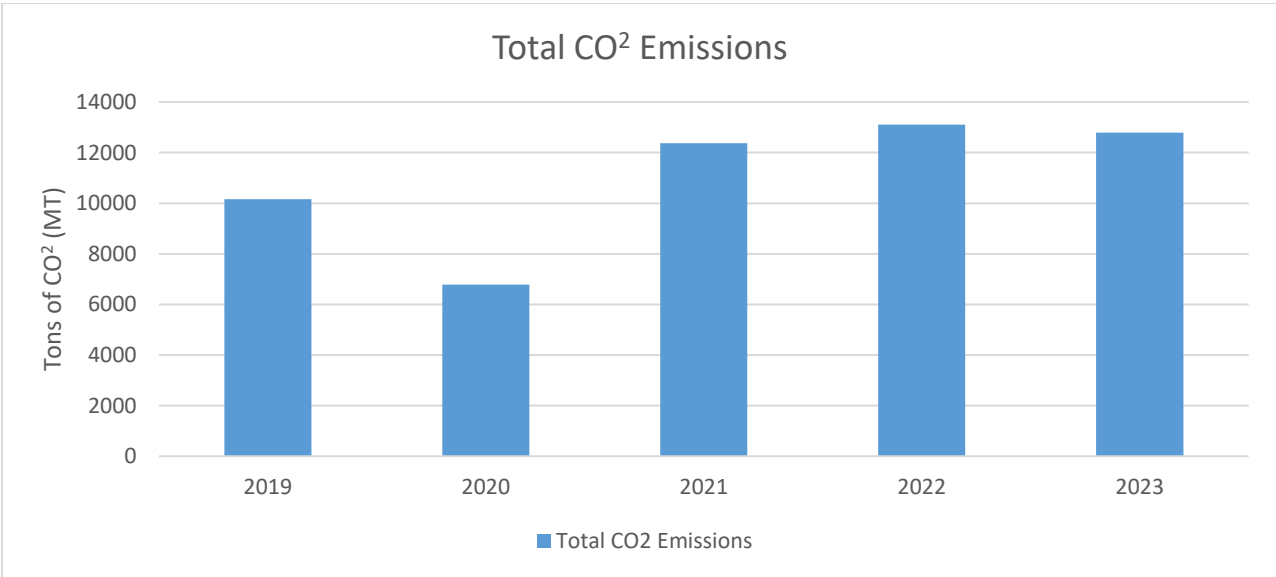


Figure 5: Tons of CO₂e Produces by Niagara Health between 2019 and 2023.

The overall carbon emissions produce by Niagara Health has increased slightly from 2019 to 2023 with a difference of 2619.7 tons. As mention previously, this can be attributed to the increase in patient visits and services that have been offered at Niagara Health.

7 Energy Conservation & Demand Management Plan Goals

In order for this Energy Conservation & Demand Management Plan to be successful in the long-term, adequate plans and targets need to be made and set. Using data shown throughout this plan, areas of interest have been targeted and will be explored further while being mindful of a new state of the art hospital in our near future.

7.1 Goal: Receive Support for Future Projects

As Niagara Health moves forwards in a society that places emphasis on improved social responsibility and environmental awareness, improvements will need to be made with the support of key staff. This will be a continuation of a goal identified in the previous plan.

7.2 Goal: Increase the Frequency of Environmental Initiative Programing

Create an annual schedule to in order to have environmental initiatives promoted throughout the year. This can be on a quarterly basis and can cover a range of topics. Various media types will showcase different environmental topics and aim to improve or change staff behaviors.

7.3 Goal: Improve Building Operating Performance

Niagara Health will continue to improve building performance through a variety of measures in order to achieve the following:

- Reduce energy operating costs by an average of 5% over 5 years
- Reduce Greenhouse Gas emissions by 5% over 5 years
- Reduce average energy consumption by 500,000 kWh per year

7.4 Goal: Monitor and Track Progress

- Track progress through monthly and annual data analysis
- Continue reporting and actively being a member of Greening Health Care and the Ontario Broader Public Sector Reporting

7.5 Goal: Implement Cost-Effective Facility Upgrades

As several of Niagara Health's sites are aging, it is important to implement cost effective projects with justifiable life-cycle analysis, and reasonable payback periods.

8 Closing Comments

Prior to, and during the creation of this plan, plans are underway to construct the South Niagara Hospital. The completion and opening of the new hospital will occur in 2028 shortly after this plan is renewed in 2024. Due to the reinvestment and potential shuttering of undisclosed hospitals mentioned in this plan, priority and return on investments have been discussed prior to committing to targets.