

HANOVER & DISTRICT HOSPITAL

Conservation and Demand
Management Plan

2024-2029



Hanover & District Hospital

90 7th Ave.

Hanover, ON

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July 2024

The Senior Team at Hanover & District Hospital is excited and pleased to present the enclosed five-year Energy Conservation and Demand Management (CDM) plan. This plan renews our 2019 CDM plan while providing an update on our successes and outlining possible opportunities for future conservation.

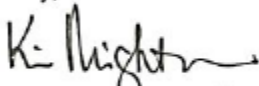
Our organization realizes that conservation takes many forms and provides benefits which include but are not limited to:

- Improved patient and employee experience
- Reduced utility bills to focus money on direct patient care
- Limiting our Green House Gas Emissions

In line with our initial CDM Plan in 2019, this document will act as a foundation for procurement, operational, and behavioural efforts over the coming years.

We look forward to providing an update on our efforts via our annual reporting and 2029 CDM Plan.

Sincerely,



Kim Mighton, Vice President of Finance & Operations

TABLE OF CONTENTS

Hanover & District Hospital	Page 4
Overview of Our Plan	Page 5
Reaffirm our Energy Management Vision	Page 5
Guiding Principles and Going Forward	Page 6
Annual Energy Consumption and Greenhouse Gas Emissions	Page 7
Results of Conservation Initiatives Since 2019	Page 8
Energy Management Goals	Page 10
Appendix	Page 12

HANOVER & DISTRICT HOSPITAL

The Hanover & District Hospital (HDH) provides a full range of primary care hospital services and selected secondary care services to the population of Hanover and the surrounding rural municipalities. The original hospital was established in 1923 and a new acute care hospital was built in 1973. It is a state-of-the-art facility with a 24-hour Emergency Department.

The Hospital's vision is to be a rural acute care center of excellence and its primary goal is to achieve organizational excellence in patient safety and care closer to home.



OUR SERVICES:

- Two state of the art Operating Rooms
- Day Surgery
- Obstetrics
- Emergency Department
- Specialist Clinics
- Medical/Surgical In-patient Unit
- Palliative Care
- Hemodialysis Unit
- Rehabilitation Services
- Restorative Care Unit
- Laboratory Services
- Diagnostic Imaging

OUR MISSION AND VALUES

HDH's mission is "Providing Exceptional Care."



PARTNERSHIPS & COMMUNICATION

The Board of Governors, staff, physicians, and community partners work together to accomplish seamless care that provides core rural health services close to home and formulates a clear pathway for referrals to additional services. HDH partners with peer acute hospitals, community agencies; long term care homes, mental health and addictions and social service providers.



OVERVIEW OF OUR PLAN

In 2014 HDH developed our initial five-year conservation and demand management (CDM) plan to actively work towards decreasing our overall energy consumption and greenhouse gas (GHG) emissions. The plan was updated and reaffirmed in 2019 to outlined goals that our hospital wished to achieve over the past five years. Once again in 2024 HDH is putting forward a new which reflects our results over the past five years and a renewal of our commitment to reducing our environmental impact.

HDH is proud to report that we have successfully decreased our total electricity consumption by 3% and saw a 13% drop in natural gas usages. This represents a decrease of 133 tCO₂e or 12% in GHG emissions. Using 2018 as a baseline and adjusting for weather, HDH sees a net 3% decrease in natural gas usages with a slight uptick in baseload power consumption resulting in less than a 1% increase. It is important to note that these achievements occurred during a period of increased service for the community.

	Electricity [kWh]	Natural Gas [m ³]	Greenhouse Gas [tCO ₂ e]	Energy Use Intensity [ekWh/ft ²]
2018	2,419,155	597,837	1,245	95
2023	2,342,418	530,990	1,112	87
2018 vs. 2023	3%	13%	12%	10%

By 2029, HDH is focused on identifying conservation measures which will continue to reduce overall energy and ultimately emissions intensity.

To further strengthen and obtain full value from energy management activities, a strategic approach will be taken: the organization will fully integrate energy management into its business decision-making, policies, and operating procedures.

Active management of energy related costs and risks in this manner will provide a significant economic return to the organization and will support other key organizational objectives.

REAFFIRM OUR ENERGY MANAGEMENT VISION

In 2014 HDH made a commitment to reducing its energy usage and greenhouse gas emissions by creating an energy efficiency vision. Recognizing the role HDH has in the community, we put a focus on using our natural resources wisely, including conserving energy and reducing our impact on the environment whenever possible. The vision developed for the hospital and the community is:

To improve energy efficiency and reduce waste by improving infrastructure, by developing forward-think policies and processes, and by incorporating new best practices and technologies.

HDH also recognizes the additional benefits that come with effective energy management including a reduction in operating costs, enabling us to place more focus on the health care needs of our community. Additionally, many energy conservation measures positively effect the environment of the hospital, whether it be through lighting conditions, staff, and patient comfort, or by having a more reliable and effective system in place.

Going forward, HDH will renew this energy management vision, in addition to applying the energy management principles discussed later in this report. Over the next five years, HDH will continue to place a focus on reducing our energy consumption (both electricity and natural gas) with the goal of reducing both and overall GHG emissions.

GUIDING PRINCIPLES AND GOING FORWARD

Going forward, HDH will apply the same guiding principles implemented in 2019 to achieve our reduction goals and improve our consumption performance. We recognize that integrating conservation and demand measures into our everyday operation is key to being successful. Detailed below are the guiding principles.

Incorporate Energy Efficiency Considerations in Infrastructure Renewal

When deciding on infrastructure renewal projects, HDH will incorporate energy efficient options into the process. HDH recognizes that improving our infrastructure not only benefits staff, patient, and visitor experience, but also enhances the hospital's efficiency, thereby reducing our energy consumption and greenhouse gas emissions. We will continue to place a focus on choosing options that are the best fit for the hospital and will do the most to improve our patient care while also offering a smaller environmental footprint.

Being Strategic in Our Policies and Processes

Continuing to track electricity and natural gas usages, we strive to significantly improve our energy-related performance. Internalize energy management into HDH's everyday decision-making, policies, and operating procedures to help assure substantial and long-lasting reductions in energy, operating costs, and environmental impact.

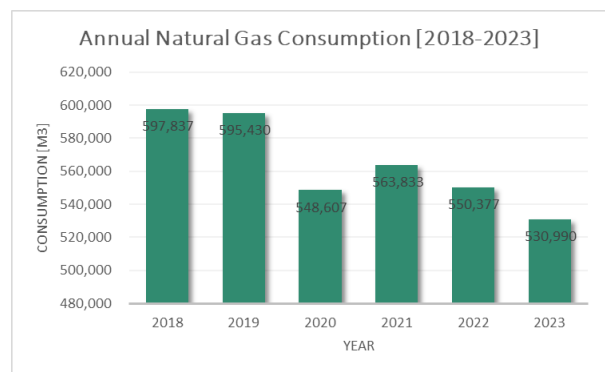
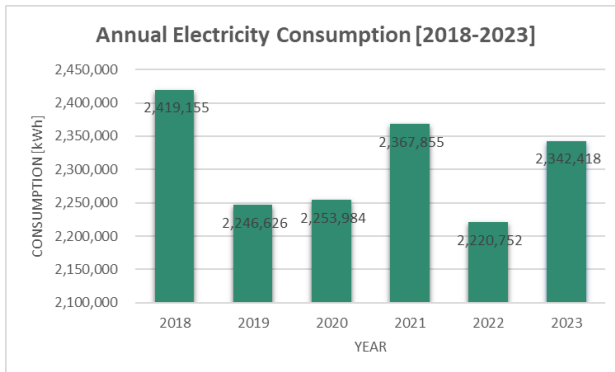
Pursue New Best Practices and Technologies

HDH will look to new practices and technology to better improve our hospital. HDH will continue to stay up to date with current best practices and work towards motivating staff and patients to implement such practices such as turning lights off when leaving a room or unplugging equipment when not in use. With new technologies offering better and cleaner options for equipment, HDH will look for medical equipment with shorter run times and higher efficiency to not only reduce consumption but also improve patient comfort and experience while ensuring high quality care.

ANNUAL ENERGY CONSUMPTION AND GREENHOUSE GAS EMISSIONS

As part of Ontario Regulation 25/23 under the Electricity Act, 1998, HDH prepares, publishes, and makes available its annual energy consumption and resulting greenhouse gas (GHG) emissions. The historical consumption data for our hospital has been included below.

Year	Electricity (kWh)	Natural Gas (m ³)	GHG Emissions (tCO ₂ e)	Energy Use Intensity (ekWh/ft ²)
2018	2,419,155	597,837	1,245	95.16
2019	2,246,626	595,430	1,233	92.97
2020	2,253,984	548,607	1,139	87.70
2021	2,367,855	563,833	1,177	90.70
2022	2,220,752	550,377	1,146	87.53
2023	2,342,418	530,990	1,112	86.67



RESULTS OF CONSERVATION INITIATIVES SINCE 2019

HDH developed goals in 2019 and green initiatives to decrease the facilities annual energy consumption and resulting greenhouse gas emissions. Our 2019 CDM Plan also included details on significant projects and initiatives the hospital was targeting to help achieve these goals. Outlined below are some of the projects completed over the past 5 years along their overall benefit energy consumption, lowering annual operating costs, and reducing greenhouse gas emissions summarized in a table.

Roof Replacement

Replacing a roof presents an excellent opportunity to increase the insulation which prevents heat loss in the winter and heat penetration during the summer. The extent to which insulation resists heat flow is measured as an R-value. The higher the R-value, the more the resistance and the better the material is at insulating a home.

As identified in our 2019 plan, the current roofing system exhibited wear and damage with minimal rigid insulation. In the past couple years, HDH was able to replace 13,595 square feet of roofing and replace old ineffective insulation with new 3-inch R-17.1 rigid insulation.

Lighting Upgrade

Replacing old inefficient lights such as compact fluorescent with highly efficient LEDs can drive significant energy savings especially for hospital which requires 24/7 lighting in significant portions of the building. Just as important, LED lights typically provide better lighting levels and quality improving staff/patient safety and experience while reducing maintenance costs because of their prolonged life cycle. HDH has recently undertaken a two-stage lighting upgrade throughout the hospital whereby approximately 1,000 T8 lights were exchanged with LEDs on the first and second floors. In addition, the over bed T12 lights in approximately 100 patient rooms were replaced with LEDs.

As part of these projects, HDH worked with our local electricity utility to capture \$11,103 in incentives while recycling old lamps which diverted glass, metals, phosphor, mercury, porcelain, and plastic from landfills.

Variable Speed Drive on Chiller/ Cooling Tower Replacement

HDH implemented Adaptive Frequency Drive (AFD) which combines chiller control systems and frequency drive technology to convert the chiller from a constant speed to variable speed compressor operation.

Variable speed operation improves chiller efficiency by reducing chiller energy consumption and electrical demand charges. Slowing chiller motor speeds also provides operational savings reducing compressor wear and the soft start provided by a drive greatly reduce stress on compressor components. In our experience, typical savings range from 18% to 25%, with paybacks often under 3 years.

Pump & Motor Replacement

In an effort to improve energy efficiency and provide more reliable cooling to the facility, NHH replaced the existing Condenser Water Pump, Stand by Pump, and Chiller Pump and associated motors which were at the end of their useful life. All three new motors installed are VFD which regulate the cycles of motors, reducing the wear and tear on the machine components while driving efficiencies when compared to constant running motors.

New Walk-in Cooler & Freezer

Replacing end of life appliances and equipment with more energy efficient models is often an effective way to reduce overall energy intensity. In most cases, not only is a reduction in energy usage achieved but performance and safety are also improved. Leveraging HIRF funding, HDH was able to replace the dietary walk-in cooler & freezer which was at the end of its useful life. In some cases, new appliances can reduce overall energy usage by up to 25%. In addition to more efficient compressors, some of the other energy saving measures associated with this project include:

- ✓ Increased R-value providing better insulation for the cooled space.
- ✓ LED lighting equipped with automatic shut off.
- ✓ Automatic door closers
- ✓ Meeting energy efficiency standards set out by Natural Resources Canada and the Energy Efficiency act.

Energy Savings Table

Project Description	Electricity (kWh)	Natural Gas (m ³)	GHG Emissions (tCO ₂ e)	Savings (\$)
Roof Replacement	53,784	-	1.16	6,992
1 st Floor - Lighting Upgrade	149,853	-	4.50	19,481
2 nd Floor – Lighting Upgrade	77,248	-	2.32	10,042
Overbed Lighting Upgrade	1,775	-	0.05	231
Cooling Tower Replacement/VFD on Chiller	76,063	-	2.28	9,888
Pump & Motor Replacement	90,496	-	2.72	11,764
New Walk-in Cooler & Freezer	4,315	-	0.09	561

It is always important to point out that, in addition to the energy savings outlined above and resulting reductions in operating costs, each one of these measures provides additional benefits the hospital and the community we support, including but not limited to: improved patient and staff comfort and safety with enhanced infection control measures.

ENERGY MANAGEMENT GOALS

Established in 2019, the following goals are what HDH uses to work towards achieving our energy vision. These same goals will continue to be an important set of objectives over the next 5 years.

1. Obtaining Executive Approval

For HDH to have the resources available to achieve our energy management goals, we will need executive approval. Ensuring that all departments, specifically key staff including financial management, purchasing/procurement, construction and building operations are aware of and ready to support HDH's CDM plans will be essential to our success. This will include clarifying and communicating staff roles and responsibilities, performance foals, and energy management reporting. In addition, creating mechanisms and processes to make resources available will assist in this process.

2. Implement Financial Practices and Decision-Making Processes

Hospitals primarily rely on available funding from the province community and volunteer organizations, and as such, need to make good decisions about how to utilize funding. HDH already has solid decision-making processes in effect but will continue to fine tune these and recognize money spent to achieve energy efficiency as an investment, not a cost. We will continue to use Life Cycle Cost Analysis (LCCA) on all new construction, major renovations, and equipment replacement. The decisions we make about energy management investments will become a part of HDH's high-level, long-range process of budgeting for capital and operations.

3. Implement Strategic Energy Management Practices

Energy management is a process of monitoring, controlling and conserving energy and involves many steps. This goal is broken down into sub-goals to better explain what HDH will be working towards over the next five years.

Utilize purchasing specifications for energy efficient equipment & services

HDH consistently use purchasing specifications that minimize life-cycle costs for energy efficient equipment and services. We also deploy efficiency specifications for standard equipment routinely replaced (e.g. lights, motors, and unitary HVAC equipment) as well as focus on LCCA for custom equipment purchases (e.g. chillers).

Set and meet clear energy performance targets; measure and improve over time.

To measure our performance goals, HDH will use 2023 as our new baseline year. This will become our target for EUI (normalized for weather and changes to care offerings) to measure our performance and improve over time.

Improve Building Operating Performance

By implementing energy efficiency standards and energy management procedures, hospital equipment will see a tune-up and operations and maintenance will see improvements, all of which will support patient care

and facility comfort and safety. As equipment reaches the end of its service life and infrastructure requires upgrades, the improved and up-to-date standards that replace the old equipment/structure will directly improve the hospitals building operating performance.

Implement Cost-Effective Facility Upgrades

When justified by LCCA, HDH will implement equipment and systems upgrades and expand our use of qualified service providers as needed. Additionally, HDH will utilize standard RFP documents, contract terms, and reporting standards.

Actively Manage Energy Commodity

HDH already actively manages energy commodity but will continue to minimize utility costs and exposure to market risks, with utility costs including natural gas, electricity, water, and sewage. We will also participate in the energy and utility regulatory process.

4. Monitor, Report, and Reward Progress

Over the next five years HDH will track our progress on achieving the goals laid out in this plan through active reporting and regular meetings. We will report energy reduction and unexpected increase so senior management and reward staff for their successes. Most importantly, we will learn from set-backs and make changes based on them to reach our energy conservation and demand management goals.

5. Continue with Facility Upgrades

HDH will continue to renew, replace, and upgrade our facility infrastructure, systems, and equipment, much of which will directly affect our annual energy consumption. These changes not only improve the hospital itself, but also its efficiency, environmental impact, and patient/staff/visitor experience. The below table includes projects that, funding permitted, we will be targeted over the next five years.

Project	Present State	Proposed State
Emergency Room (ER) Redevelopment	The HDH ER is in need of redevelopment to bring up to today's standards while improving patient and staff experience.	While undertaking redevelopment of the ER, HDH will look to include the most up to date technology including but not limited to: LED lighting, energy efficient equipment, new AHUs, etc.
Replace Air Handling Unit (AHU)	Several AHUs are approaching the end of their useful life.	As funding becomes available, HDH will replace AHUs in order of necessity while implementing new more energy efficient units.
Update 3 rd Elevator	Currently not in service.	Bringing the 3 rd elevator back into service will allow HDH to utilize newer, safer, more energy efficient equipment while improving service to staff and patients.
Identify New Conservation Measures	HDH has implemented significant conservation measures over the past 5 years, with a need to look for new opportunities to capitalize on going forward.	As part of our efforts over the next 5 years, HDH will look to engage third party experts to help identify opportunities for improvement.

APPENDIX

