CORNWALL COMMUNITY HOSPITAL

HÔPITAL COMMUNAUTAIRE DE CORNWALL

CONSERVATION AND DEMAND MANAGEMENT PLAN

July 1, 2024

Cornwall Community Hospital
840 McConnell Ave
Cornwall, Ontario
K6H 5S5

RE: RENEWAL OF 5-YEAR CONSERVATION AND DEMAND MANAGEMENT (CDM) PLAN

July 1, 2024

Cornwall Community Hospital would like to put forward the enclosed five-year Energy Conservation and Demand Management (CDM) plan as the next chapter in our strategic pursuit to reduce our overall energy intensity and carbon footprint. This plan renews our 2019 CDM plan while providing an update on our successes and outlines possible opportunities for future conservation.

You will note, our organization has continued to grow to meet the evolving needs of our community while implementing best practices when it comes to energy management. The sum of these efforts has not only made us more energy efficient but improved patient and staff experience and safety.

In line with our initial CDM Plan in 2014, this document will act as a blueprint to focus and guide our efforts and actions toward furthering our energy vision over the coming years.

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

Sincerely,

Jeannette Despatie
President and Chief Executive Officer
Cornwall Community Hospital

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CORNWALL COMMUNITY HOSPITAL

The City of Cornwall is nested along the north bank of the St. Lawrence River. The Cornwall Community Hospital is centrally located on McConnell Avenue, just south of Ninth Street and within proximity of the downtown. The site has good access to major city thoroughfares as well as to the highway 401 directly to the north providing access to the remainder of the region.

Cornwall Community Hospital (CCH) is a 150-bed acute care facility operating in the City of Cornwall. In addition, CCH operates several community mental health programs onsite, within the City of Cornwall, and counties of Stormont, Dundas and Glengarry. With a staff of 1,100 employees, CCH serves acute, in-patient, out-patient and community-based clients through a wide range of medical specialties. On an annual basis CCH typically sees 52,000 visits to the emergency department, performs 9,000 surgeries and conducts over 200,000 diagnostic/therapeutic exams.

In 2013 CCH opened its new West Wing addition, which saw 95,000 square feet being added to the hospital to house the new Emergency Department, Diagnostic Imaging Centre and Surgical Suites. Following this, CCH completed a major redevelopment project in 2014 and the construction of the Addiction and Mental Health Centre at the end of 2016. This consolidated all acute care and community services at one address, allowing CCH to better serve the community.

Our Mission

Our health care team collaborates to provide exceptional patient centered care.

Our Vision

Exceptional Care. Always.

Our I.C.A.R.E. Values

Integrity. Compassion. Accountability. Respect. Engagement.

ABOUT THE PLAN

In 2014 CCH developed a five-year conservation and demand management (CDM) plan to actively work towards decreasing our overall energy consumption and greenhouse gas (GHG) emissions which was subsequently renewed for an additional 5 years in 2019. The previous plans outlined goals that our hospital wished to achieve over the last ten years and listed several initiatives that we had planned on taking to achieve these goals. This plan, completed in 2024, is a reflection on our results over the past ten years and a renewal of our commitment to reducing our environmental impact.

The following table compares our utility consumption from the beginning of our initial CDM plan to the end of CCH's 2019 plan in 2023.

	Electricity [kWh]	Natural Gas [m^3]	District Heating [GJ]	GHG [kg CO_2e]	Energy Use Intensity [ekWh/m^2]
2013	12,092,030	769,821	38,850	3,916,753	6.59
2023	8,901,969	840,345	32,035	3,589,978	5.66
2013 vs. 2023	-26%	+9%	-18%	-8%	-14%

Note that while CCH's total square footage decreased in 2015 when CCH amalgamated the Second Street and McConnell sites, our overall capacity for care was centralized at our main location which has certainly impacted CCH's energy use intensity over the last 10 years and in particular during the Covid 19 Pandemic. During the height of the pandemic, the building was often well over capacity further increasing our energy intensity as compared to the original model developed in 2014. Recognizing the challenges associated with the pandemic, CCH is proud of the accomplishments we have made, including a 8% decrease in GHG Emissions which represents a total of 326,775 kg of CO_2e as well as a reduction of 14% in our energy use intensity.

By 2028, CCH can expect the following results if we obtain the funding and resources to implement all of our proposed future projects highlighted in this plan.

- 25% reduction in total equivalent energy use.
- 573,597-kilogram reduction in CO_2e.

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

A REFLECTION ON CCH'S 2014 ENERGY EFFICIENCY VISION

In 2014 CCH made a commitment to reducing its energy usage to decrease our greenhouse gas emissions and electrical/natural gas demand. CCH created an energy efficiency vision that it set out to be achieve by 2018.

Cornwall Community Hospital's 2014 Energy Efficiency Vision

In 2018, Cornwall Community Hospital will have an energy wise culture and will be viewed by others as a leader in energy efficiency initiative. It will have reached its goal to be recognized within the top 25th percentile of energy efficiency hospitals in Ontario through innovation and continuous improvement initiatives. In addition, the carbon footprint and greenhouse gas emissions form the hospital will be reduced providing overall financial savings and improved patient comfort. The CCH Board of Directors, staff, patients, suppliers and community stakeholders will be committed to playing an active role in these initiatives and the hospital will strive to share its knowledge and experience gained with others.

Along with its energy efficiency vision, CCH also set a target of reducing its energy consumption from the baseline value in 2013 by 2018. Both CCH's vision and target put a focus on reducing the Hospital's carbon footprint and greenhouse gas emissions to realize overall financial savings and improved patient comfort.

VISION: Be in the top 25th percentile of energy efficiency hospitals in Ontario.

RESULT: Although CCH did not hit this goal within the first 10 years of the plan, we still managed to substantially decrease our electricity and thermal energy from District Heating and will renew this vision for the next five-year period.

TARGET: Reduce energy consumption from the baseline year of 2013 by 25%.

RESULT: Over the past ten years CCH has successfully reduced its total equivalent energy consumption by **14% (4,352,294 ekWh)**.

GOAL: Reduce CCH's carbon footprint and greenhouse gas emissions to provide overall financial savings and improved patient comfort.

RESULT: Since 2013, CCH has decreased its greenhouse gas emissions and thereby its carbon footprint by a total of 326,775 kg CO_2e which represents an **8%** overall reduction. We will continue to work towards Canada's goal of reducing by 40% from 2005 levels by 2030.

HOW WE WILL ACHIEVE SUCCESS

From our success over the past ten years, CCH will continue to apply our original guiding principles for energy management that were outlined in our 2014 report. These have been slightly revised to better match CCH's energy management vision.

A Whole Building, Integrated Systems Approach:

In 2014, CCH placed a focus on a comprehensive and integrated whole building approach for energy management solutions that would consider the connection between conservation opportunities. This has proved to be a successful principle to follow, one that CCH will continue going forward. Recognizing the many benefits that come with energy conservation measures, CCH will continue to integrate CDM measures into our everyday decision-making processes. This will include looking for greener and more efficient models when replacing equipment, introducing new processes to reduce consumption, and consistently looking for new opportunities to improve the hospital.

Community Engagement:

Building off the 2014 principle of engaging facilities stakeholders, including staff and patients, in the development and active implementation, measuring and reporting process, CCH will continue to work with all hospital members to implement CDM initiatives. While large scale projects are extremely effective in decreasing utility demand, changing human behaviour and habits can be just as effective. CCH will place a new focus on educating staff, patients, and visitors on what they can do to reduce their own demand, such as turning off lights when they leave a room and unplugging/powering off equipment when not in use. This patient and staff engagement will benefit both CCH and the Cornwall Community as a whole.

Sustainability

CCH will continue to look beyond energy to consider other resources such as water and materials to further the benefits seen through costs and savings initiatives streaming from efficiency and proper management. While CCH is proud of the accomplishments we have achieved over the past five years, we will continue to place a focus on sustainability of the organization and linking initiatives to see benefits beyond just electricity and natural gas demand reduction. CCH will continue to expand the scope of financial analyses to include co-benefits and the opportunity costs of managing risk more effectively over the next five years.

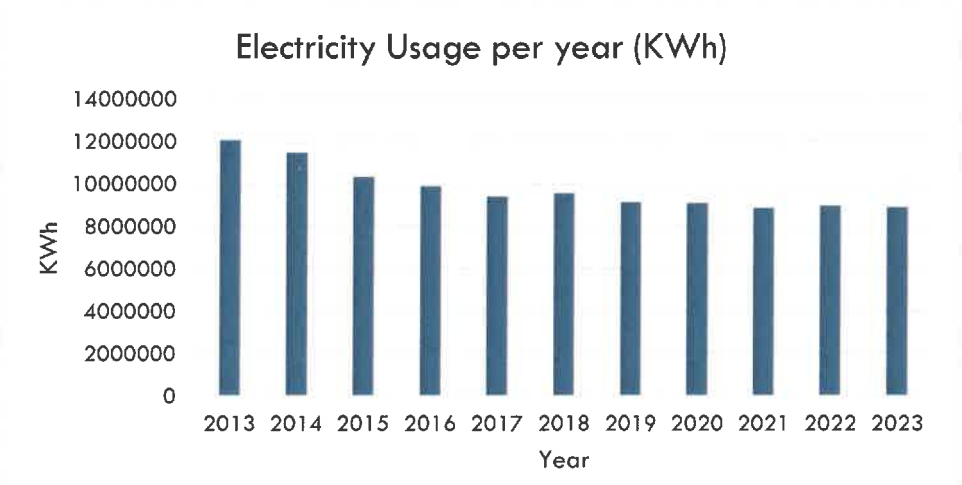
By applying these principles, CCH will continue to work towards decreasing our overall utility consumption and thereby our annual greenhouse gas emissions. CCH's effective energy management will also lead to additional benefits, including an enhanced healing and work environment, improved financial health and operating cost reduction, and a strengthened community leadership.

ANNUAL REPORTING UNDER ONTARIO REGULATION 507/18

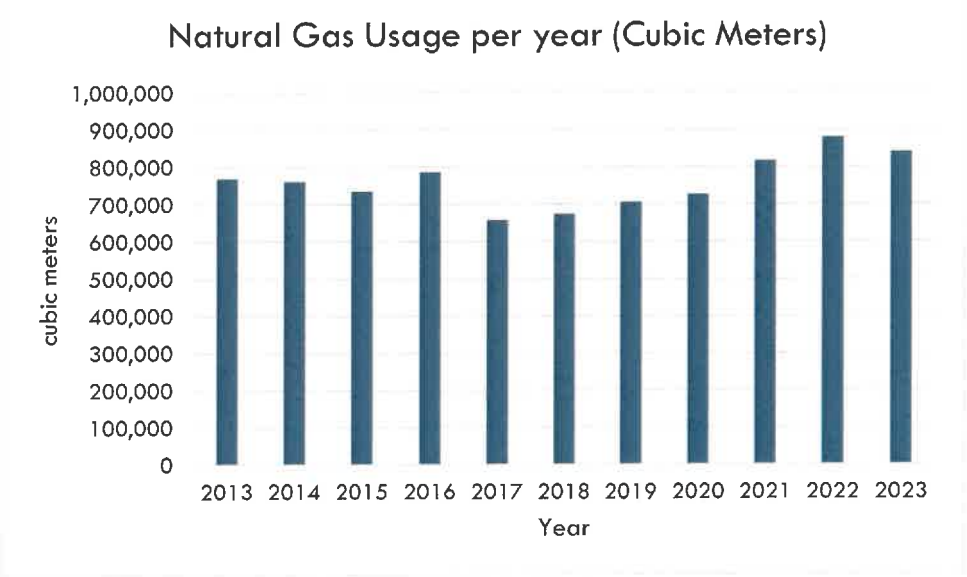
As part of Ontario Regulation 507/18 under the Electricity Act, 1998, CCH publishes and makes available to the public its annual energy consumption and resulting greenhouse gas (GHG) production. In addition, CCH actively tracks our monthly electricity, natural gas and thermal capacity (district heating) to help monitor our progress towards our energy management goals. Note that CCH's total floor area increased in 2014 when the 95,000 ft^2 addition was reported, then decreased by over 160,000 ft^2 when CCH's two locations were consolidated.

Year	Total Floor Area (ft^2)	Electricity (kWh)	Natural Gas (m^3)	District Heating (GJ)	GHG Emissions (kg CO_2e)	Energy Use Intensity ($ekWh/m^2$)
2013	434,688	12,092,030	769,821	38,850	3,916,753	6.59
2014	529,688	11,498,169	762,137	43,808	4,138,225	6.75
2015	361,249	10,344,000	735,751	39,536	3,826,155	6.19
2016	361,249	10,252,500	814,463	33,145	3,606,494	5.86
2017	361,249	9,748,500	680,126	33,457	3,271,668	5.39
2018	361,249	9,576,000	674,231	34,066	3,397,458	5.56
2019	361,249	9,154,500	705,900	35,026	3,493,855	5.59
2020	361,249	9,100,495	726,837	29,448	3,243,512	5.30
2021	361,249	8,876,649	817,383	31,596	3,521,982	5.58
2022	361,249	8,985,986	879,719	34,266	3,784,484	5.90
2023	361,249	8,901,969	840,345	32,035	3,589,978	5.66

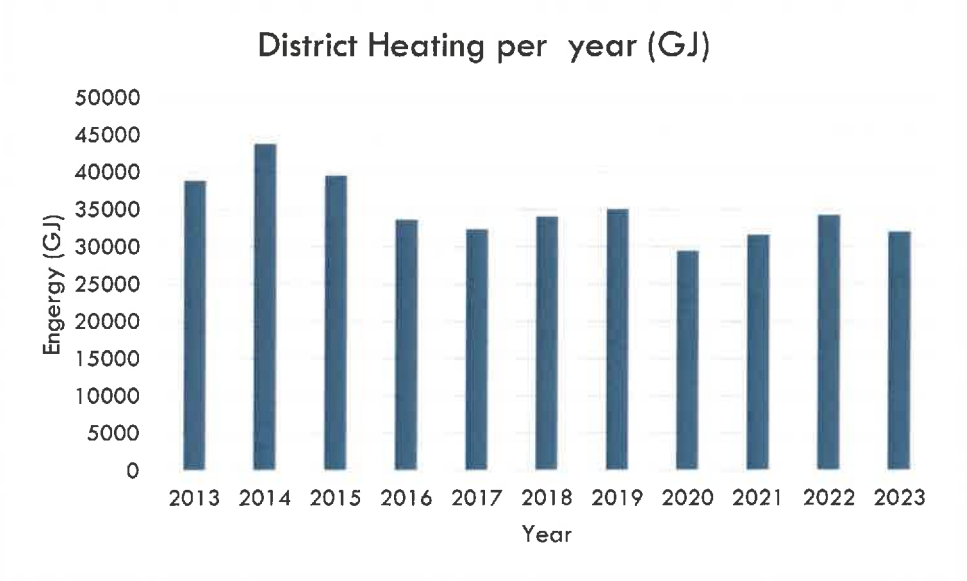
CCH's total annual electricity, natural gas and district heating consumption was plotted from 2013-2023. Overall, CCH's electricity consumption has decreased by 26% since 2013 and 14% since the amalgamation of the two CCH sites.



CCH's natural gas usage increased over the last five years as result of an increase in humidification in the building. During the pandemic, the world health organization advised that building operators increase building relative humidity from a minimum of 30%RH to 40%RH. CCH started to increase humidification levels in 2019. Overall, CCH's onsite fuel consumption has increased by 9% since 2013.



CCH's district heating has decreased by 18% overall since 2013. However has increased by 8% since 2020. The increase over the current cycle has been as result of increases in fresh air being delivered to the spaces within the building. During the Covid 19 Pandemic, the air handling systems serving the building were setup to deliver as much fresh air as possible as a mitigation strategy to reduce the spread of the virus within the building.



CONSERVATION AND DEMAND INITIATIVES UNDERTAKEN SINCE 2019

The following projects were completed between 2019 and 2023 to reduce CCH's energy consumption, greenhouse gas emissions, as well as improve staff and patient comfort and hospital infrastructure.

Project Name	Description	Electricity [kWh]	Natural Gas [m^3]	GHG Emissions [kg CO_2e]	Annual Savings [$/year]
LED Retrofit	CCH continuously replaces bulbs as they burn out with LED alternatives	51,266	-	1,769	$6,665
Chiller Plant Optimization	Chiller plant was re-commissioned to improve operating efficiency and reliability including modifications to the building automation system algorithms.	108,993	-	3,760	$14,169
Tower south wing roof replacement	Thermal insulation value (R-value) of the roof increased.	7,155	4,236	8,430	$753
Tower perimeter heating pumps replacement	Tower perimeter heating pumps (quantity 16) changed from constant volume pumps to six (6) pumps equipped with variable frequency drives.	104,738	-	3,613	$13,616
TOTAL		**272,152**	**4,236**	**$15,690**	**$32,203**

In addition to the energy savings and reduced emissions of our past initiatives, the projects also helped improve patient experience.

- Increasing the thermal insulation of the roof offers more stable inside temperature control.
- Chiller plant optimization was completed in 2020. A comprehensive review of the operating parameters of the central chilled water plant was completed. A number of programming changes were made to improve the system operation. The system was rebalanced and the chillers were completely overhauled to ensure efficient operation. The changes made greatly improved the reliability of the central chilled water plant and resulted in much better temperature and humidity control in the building for occupants.
- Replacing fixtures with LED reduces the hazard of heat emission while producing virtually zero UV emissions: LEDs are a safe and reliable lighting source which enhance patient safety and comfort.

GOING FORWARD – OUR REVISED OBJECTIVES AND PROPOSED MEASURES

In 2014 CCH developed an extensive list of objectives that we wished to achieve over our initial five-year CDM Plan. Moving forward, CCH would like to renew these efforts to include both old and new measures. These objectives and proposed measures are set to be implemented for, at minimum, the five years that this plan covers but some will be in place well beyond 2024.

Establish Staff Commitment

- The Senior Team at CCH has approved this CDM Plan and continues supports our efforts to conserve energy and reduce our overall impact to the environment.
- Engaging key staff (Purchasing/Procurement, Construction, Building Operations, etc.) via communication, education, and recognition for their efforts to reduce energy use are will be critical to the success of our objectives and measures.

Initiate Low Cost No Cost Actions

Implement Cost-Effective Facility Upgrades

- Replace equipment and supplies at end of lifecycle with energy efficient equivalents.
- Implement equipment and system upgrades where justified by life-cycle cost analysis.
- Continue to deliver proper Preventative Maintenance Programs.
- Expand use of qualified service providers as needed. Utilize standard RFP documents, contract terms, and reporting standards.

Actively Manage Energy Commodity

- Minimize utility costs and exposure to market risks. Utility costs include natural gas, electricity, water, district energy, and sewer.
- Participate and keep abreast of energy/utility regulatory process.

Improve Building Operating Performance

- Equipment tune-up and improved Operations and Maintenance (O&M) will optimize performance while supporting patient care, and facility comfort and safety.
- Optimize Building Systems (BAS) between current and expanded facility to ensure synchronisation.

Determine New Capital Requirements

Implement Financial Practices and Decision-Making Processes

- Money spent to achieve energy efficiency is viewed as an investment, not a cost.
- Financial decision makers consistently use Life Cycle Cost Analysis (LCCA) on all new construction, major renovations, and equipment replacements.

- Decisions about energy management investments will be part of CCH's high-level, long range process of budgeting for capital and operations.
- To support the achievement of our energy conservation measures, CCH requires investment in energy-related capital and operating improvements, via municipal, provincial and federal sources.

Determine Finance and Budget Requirements and Opportunities

- Recognizing that many of the most effective energy conservation and demand initiatives are expensive, CCH will continue to work with national, regional and local sources for strategic, technical and financial assistance to help achieve our goals. For example, leveraging the use of such programs as The Ministry of Health and Long-Term Care's Hospital Infrastructure Renewal Fund (HIRF) to help implement projects which complement our energy management values.
- Apply established purchasing procedures and specifications and include incentives and tax credits wherever available.
- Consider a prudent return on investment

Manage Accountability and Responsibility

- Track and report on energy use by department to illustrate opportunities to conserve and engage staff.
- Install sub-meters for the main hospital departments to allow detailed tracking of energy use and benchmarking for each zone.
- Participate in Strategic Energy Management incentive programs for sub-metering funding which will provide process data and justification for business case requirements for future capital investments.

Develop EE Policy and Document Operating Procedures and Standards

Purchasing Specifications for Energy Efficient Equipment & Services

- Consistently use purchasing specifications that minimize life-cycle costs for energy efficient equipment and services.
- Utilize efficiency specifications for standard equipment routinely replaced (e.g. lights, motors, and unitary HVAC equipment).
- Enforce efficiency guidelines that apply LCCA for custom equipment purchases (e.g. chillers).
- Continue to use a Green purchasing Policy that includes energy efficiency that will be a key consideration of future procurement of goods and services at CCH.
- Have suppliers provide reporting on the impact energy for all projects/purchases.

Efficiency standards for design and construction, and for building operations and maintenance

- Implement Enhanced Design & Construction (D&C) Practices

- Implement improved new construction practices in all projects that specify early team collaboration and "Integrated Design" (ID).
- Integrated design required for funding.
- RFPs, contract terms & conditions, & fee structures will support ID.
- Apply LCCA and financial hurdle rates described above to design decisions.

- Use LEED or LEED shadow standards for future construction and retrofit projects.

Establish Necessary Partnerships

- CCH will continue to collaborate with industry groups and partners such as: Cornwall Electric, Embridge Gas, Other suppliers of equipment and expertise, City of Cornwall, HealthPRO, etc.

Measure and Report on Results

- Make energy management a line item during general staff meetings to track and report progress.
- Report energy reductions and unexpected increases to senior management.
- Involve and inform staff and the Board regularly on status of the Plan, savings, and return on investment, etc.
- Learn from setbacks.

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

- Establish baseline for measuring performance goals (e.g. code, or national reference standards like ASHRAE 90.1).
- Target each building at less than MNEC for buildings.

Future Projects

In addition to the above objectives, CCH has several projects that we hope to complete within the next five years that will not only improve the hospital environment for both patients and staff, but also further improve the hospitals energy efficiency and performance. The following table summarizes these projects. The below projects, which are technical based, will be in place until the end of their service life, which is dependent on the make and model that we install (funding permitted).

Initiative	Electricity (kWh)	Natural Gas (m^3)	GHG Emissions (kg CO2e)	Annual Savings ($/year)
LED Light Fixture Upgrade	457,120	-	16,228	$61,254
On-Site Boiler Plant	TBD	TBD	TBD	TBD
Heat Recovery Chiller	TBD	TBD	TBD	TBD
Steam Boiler Plant Replacement	TBD	TBD	TBD	TBD
Tower Domestic Hot Water Recirculation	TBD	TBD	TBD	TBD
Replace Fan in ICU Isolation Room with 2 VFD Fans	2,511	-	87	$326
Add VFD's to JMP AHU 2	46,515	-	1605	$6,047
TOTAL	**506,146**	**-**	17,462	**$65,799**

CCH has plans to engage in a complete analysis of a proposed on site heating plant to eliminate the need for heat from the offsite cogeneration plant. As part of the study and eventual project, the existing on site steam boiler plant for humidification and sterilization will be replaced with new technology. Upgrading our humidification system would further improve the hospitals efficiency; the audit will provide energy savings estimates and will be completed in 2024. The items listed above as "TBD" will be added to our 5 year plan as the information becomes available.

BUSINESS PROPOSITION

The following are considerations to be included in CCH's business philosophy and budgetary process. The business proposition is as follows:

- If energy management considerations are integral to relevant business practices, policies, procedures, and decision-making processes, CCH's energy-related costs can be mitigated further over the coming 5-year period.
- Considering the future CDM projects for 2024-2029 outlined above, CCH can expect to see the following additional reductions/avoidances in utility usage for the items listed as "TBD" based on preliminary reports generated as part of an energy performance contract review that was completed for CCH in 2020:
    - $500K per year in utilities cost savings
    - 250 tons/year of CO2e reduction