Queensway Carleton Hospital

Queensway Carleton Hospital

Energy Conservation & Demand Management Plan

June 2024

Our Vision

Trusted as one of Canada's most caring and innovative health partners, fostering vibrant, healthy communities.

Our Mission

To provide high-quality, compassionate, and coordinated care for the people and communities we serve.

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A. Executive Summary

The Conservation and Demand Energy Management Plan fulfils the reporting requirements of the Ontario Regulation 507/18 (formerly 397/11) providing the Queensway Carleton Hospital (QCH) with a structured approach to support continued energy and sustainability initiatives within our built environment as well as operations and programs. Implementation of all initiatives are subject to current and future budget approvals.

QCH submitted utility data to the Ministry of Energy every calendar year since 2019, as required under Ontario Regulation 397/11 and is compliant with the regulation requirements for reporting and planning.

The Energy Conservation and Demand Management Plan (ECDM Plan) for QCH began in June of 2019. The original plan was prepared using a planning framework that included the following tenets:

- Organization Commitment
- Opportunity Identification
- Awareness and Engagement
- Monitoring and Tracking

The success of this approach will be quantified and folded into a new vision that uses the initial framework as a springboard to 2029.

However, recent legislative changes, environmental fluctuations and market forces have created a greater sense of urgency in the arena of demand management. In particular, the frequency, unpredictability and intensity of recent natural disasters have clearly indicated that a fair measure of resilience must be included in the planning process.

Finally, energy costs for the campus have increased by 33% over the last five years and will continue to increase based on the proposed expansion of the hospital with the next 5 years and rising. Our new vision will decelerate our costs, increase our efficiencies, and lay the groundwork for the next generation by implementing the latest analytical tools and technologies. Appendix “A”.

B. Introduction

QCH opened in 1976 as a 240-bed acute care facility on a 51-acre campus in the west end of the City of Ottawa (Formerly Nepean). The original facility was 240,000 sq. ft. constructed in a period with somewhat limited environmental planning foresight. Since 1976 the facility has had several growth initiatives in 1986, 1998, 2005, 2008, 2009, 2012 and 2023 expanding the facility footprint to 670,000 sq. ft.

Located in fast-growing west Ottawa, Queensway Carleton Hospital has built its reputation as a leading acute care hospital by seeing the person in each of the nearly 500,000 people who turn to it for care each year. QCH’s agility and collaborative culture enable it to respond quickly to the most

pressing healthcare challenges facing its vibrant and growing communities through advanced programs that reinvent models of patient care. QCH has been named the #1 hospital in Ottawa by Newsweek magazine in 2021 and as a top employer in Canada by Forbes magazine.

Queensway Carleton Hospital, West Ottawa's only full-service hospital, offers a diversity of medical and surgical programs and services. With a team of over 2,700 health professionals, the 355-bed Queensway Carleton Hospital is the secondary referral centre for the Ottawa Valley.

QCH acknowledges we are on the traditional and unceded lands of the Anishinabe Algonquin Nation.

C. Energy Conservation and Demand Management Plan

The ECDM plan is made up of four key elements:

- Building impetus from our recent achievements.
- Re-defining and recalibrating goals.
- Expanding our conservation and demand platform and implementing improvement strategies.
- Evaluating and measuring results.

Building Impetus from Recent Achievements

Some of our many energy saving initiatives are listed below.

1. **Water**
   a. Our water consumption has decreased significantly by the introduction of low volume toilets and urinals.

   b. Additionally, our domestic hot water system is operating more efficiently by switching to programmable computer controls, high efficiency pumps and heat exchangers. Primary and secondary domestic hot water loops are now delivering the required temperature to consumers on demand without having to let taps run and wastewater.

c. Cooling tower upgrades resulted in reduced water consumption and electricity usage. The evaporation cycle is more efficient creating larger delta Ts, with less water consumption and an estimated decrease of $154,100 in electricity, annually.

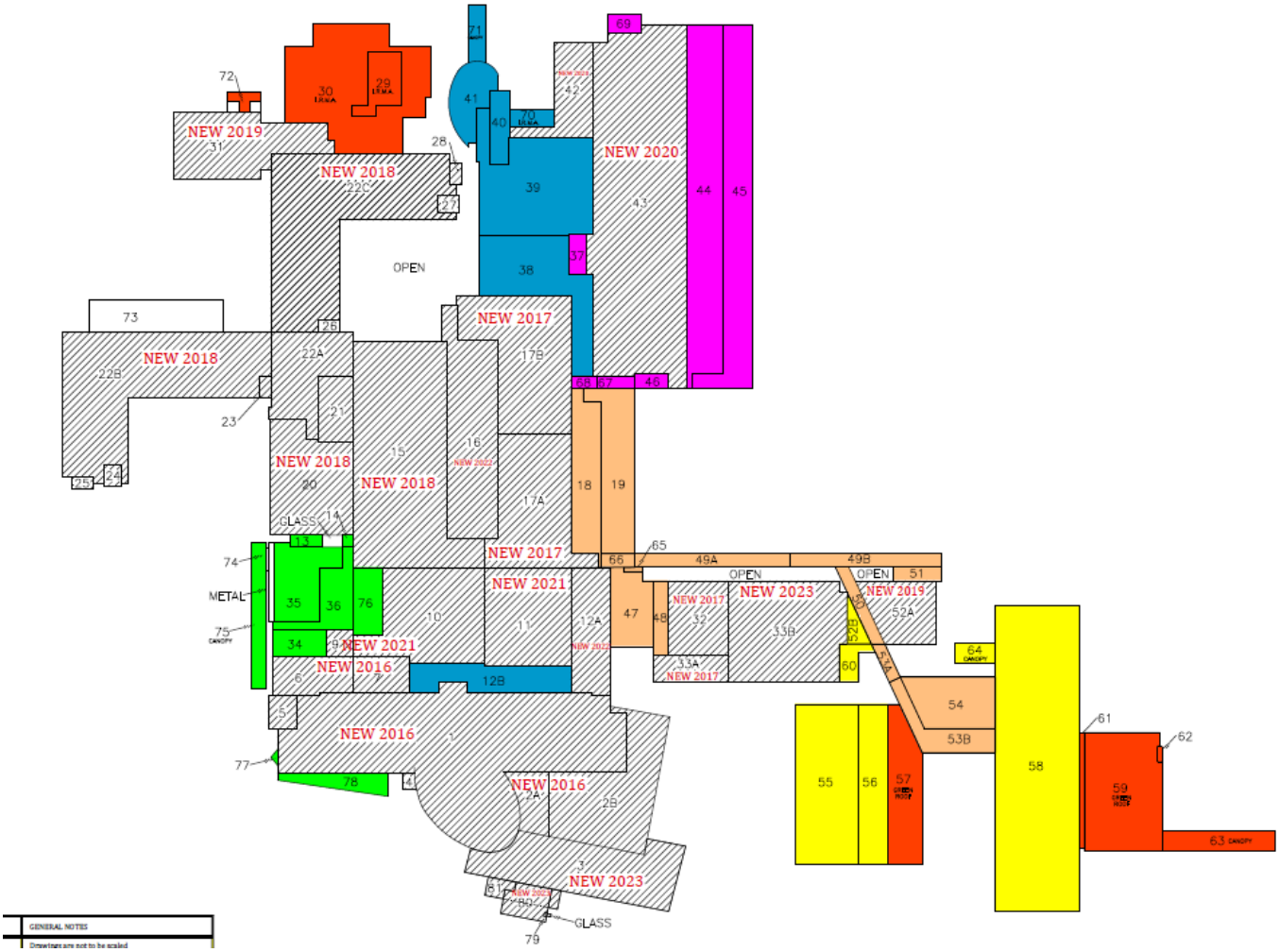
2. **Lighting**
An extensive re-lamping programme was initiated on a campus-wide basis, introducing low energy LED bulbs. This included the parking garage, ring road and parking lots lighting along with several departments within the Hospital. We are currently working on changing out all the remaining non-LED within in the Hospital's walls which will take our current Green House Gas reduction total to 115,00 kg CO2e.

Project	Timing	Annual Energy Saving	Annual GHG Saving	Investment
		kWh	kg CO2e	$
Parking Garage	2013-2014	Indeterminate	Ind.	50,000
Ring Road & Parking Lots	2018-2019	Ind.	Ind.	Ind.
C4, D4 & D3	2021-2022	112,015	13,755	composite
C3 & C2	2022-2023	74,677	9,170	composite
Balance of campus	2024	746,775	91,704	211,082

3. **VFDs**
All large motors in continuous service are being outfitted with energy saving VFDs. We are currently undertaking a project to add 23 VFDs that will reduce annual electrical consumption by 915,760 kWh at an investment of $181,875. The estimated annual electrical cost reduction is $137,364. Anticipating 6 months in duration with at project completion in fall of 2024 and an annual GHG reduction of 112,455 kg CO2e.

4. **Roofing**

Major portions of the campus roof were resurfaced with high-insulating materials to limit heat loss. The Hospital has been heavily invested in restoring and replacing roofs on campus since 2016. The visual below shows the areas of the campus restored/replacement by year since 2016. The Hospital Infrastructure Renewal Fund (HIRF) has supported several roofing replacement projects over the years. The Hospital has a 5-year roofing replacement plan that is reviewed and updated on an annual basis.



5. **Windows and doors**

A replacement program for windows and doors is under way, with annual financial commitments, to reduce energy losses. Investments have been earmarked for several initiatives this fiscal year.

6. **HVAC systems**
   All large HVAC energy consumers such as chillers, boilers, cooling towers and distribution pumps were refurbished and upgraded for higher efficiency between 2021-2024. A comprehensive steam trap audit was conducted, and corrective action was taken.

   All instrumentation and sensory components were re-commissioned between 2021-2022 to assure accuracy and tighten up operational control limits. All schedules were revised to reduce service to some areas during periods of dormancy.

   A comprehensive Air Handling Unit replacement / upgrading program was set in motion in 2021 with the Mental Health Renovations & Addition project which will soon be followed by 2 units in the Fall of 2025. The ultimate goal is to replace all AHUs (Air Handling Units) that are approaching end-of-life within a specified time frame while mandating energy saving units for all new construction.

Re-defining and Recalibrating Goals

Our current strategies are divided into short-term and long-term goals.

1. **Short-term goals**

   Having achieved all objectives of our previous CDM plan, the current mission is the pursuit of the following short-term goals.
   a. Expand current controls environment to increase data collection, analysis, and optimization. This will involve the integration of AI with our current automation systems to achieve more granular insights of our operating profile.
   b. Increase electrification of the campus with concurrent reduction of natural gas dependency. This will entail converting current gas-dependent machines to electricity-based models.
   c. Increase electrical generation capability by integrating one or more of the current renewable technologies such as PV, geothermal, with traditional sources.
   d. Design for climate change and energy resilience.

2. **Long-term goals**

   Target GHG emissions by 30% by 2030 from 2019 level.

Expanding our Conservation & Demand Platform & Implementing Improvement Strategies

Our data collection and analysis initiative has informed and enlightened our CDM planning outlook, our improvement strategies along with our current infrastructure expansion. We will make a significant investment in this area within the near future to better understand our consumption profile and match it against external forces and variables such as energy market trends, weather patterns, consumer behaviour, user requirements and industry trends.

Evaluating and Measuring Results

QCH is committed to evolving and improving our plan and approach over the next five years and beyond. As with all improvement initiatives, regular evaluation will provide the ability to determine whether we are on course or need recalibration. There will be annual objectives that are geared to the 2030 goals. Progress of the annual objectives will be reviewed quarterly to ensure that we are on target and moving towards our ultimate plan goals. The master plan and next major project initiative will provide a platform to continue building the future of QCH with a greener, clearer and more resilient and sustainable infrastructure.

Appendix A

Yearly Energy Consumption

2019- 2024

	2019-20	2020-21	2021-22	2022-23	2023-24
Electricity ($)	14,893,889	13,939,114	13,999,438	19,921,125	19,938,336
Gas Volume (M3)	4,328,342	4,154,494	4,301,380	3,700,563	2,659,144
Gas cost ($)	808,467	1,017,606	1,092,908	1,205,489	1,037,920