

# Energy Conservation and Demand Management Plan 2025-29

## Overview

St. Joseph's Healthcare Hamilton (SJHH)'s Energy Conservation and Demand Management Plan (ECDM) provides a summary of accomplishments to date and projects planned to continue our path to a greener, sustainable Healthcare System.

As a Broader Public Sector (BPS) organization, SJHH is required to develop an ECDM Plan and update the same every 5 years. This plan was developed in compliance with O. Reg 25/23 (formerly 507/18). The plan has been reviewed and approved by senior management.

## Purpose and Goals

SJHH is committed to working towards net zero carbon emissions by year 2050. Efforts and initiatives are carried across four focused pillars: energy/utility management, waste reduction, pollution management and education and awareness.

SJHH seeks continual improvement in lessening its impact on the global environment through incorporating environmental sustainability measures into strategic planning, as well as day-to-day operations.

## Completed Measures

The following projects were completed or will be completed during the period 2020 through 2024:

Project	Location	Annual Savings			Net Cost	Annual Savings
		Electricity (MWh)	Natural Gas (m <sup>3</sup> )	CO <sub>2</sub> e (tonnes)		
Room/Corridor LEDs	Charlton	404		7.3	\$138,728	\$52,458
BAS Recommissioning	Charlton	541	557,000	1,061.4	\$0	\$279,150
Chiller Optimization	Charlton	384		6.9	\$0	\$49,929
Exterior Signs & Lighting	Charlton	18		0.3	\$3,015	\$2,340
Entrance Air Barriers	Charlton	119	67,300	129.2	\$13,000	\$40,701
Blowdown Heat Recovery	Charlton		78,000	147.3		29,242
Steam Trap Replacement/Line Insulation/Wireless Monitoring	Charlton and King		48,000	90.6	\$20,140	\$17,995
Electricity, Natural Gas, Water Online Dashboard	Charlton				\$10,000	
Reheat Control Valves	Charlton		31,400	59.3		\$11,772
King St Lighting	King St	57		1	\$18,288	\$7,410
<b>TOTAL</b>		<b>1,523</b>	<b>781,700</b>	<b>1,503</b>	<b>\$203,171</b>	<b>\$490,997</b>

- Calculated electrical energy reduction of 1,523 Megawatt Hours per year [MWh/yr.]
- Calculated natural gas consumption reduction of 781,700 cubic meters per year [m<sup>3</sup>/yr.]
- Calculated Greenhouse Gas (GHG) Carbon Dioxide equivalent (CO<sub>2</sub>e) emission reduction of 1,503 metric tonnes (tonnes)

- Equivalent to removing 734 passenger vehicles from the road for one year

### Proposed Measures

The following potential projects will be investigated over the next 5 years and those with the best business cases will enable St. Joseph's Healthcare Hamilton to meet its plan for a greener Healthcare System over the next 5 years. The projected annual savings are: 5,040 MWh & 1,688,220 m<sup>3</sup>

Project	Location	Projected Annual Savings			Estimated Cost	Projected Annual Savings
		Electricity (MWh)	Natural Gas (m <sup>3</sup> )	CO <sub>2</sub> e (Tonnes)		
Room/Corridor LEDs	West 5th	1,824		73	\$633,450	\$237,120
Room/Corridor LEDs	Charlton King St	438		18	387,109	\$54,869
Solar PV (1,000 kW)	King St	1,240		50	\$1,960,200	\$161,200
Window Films	Charlton	938	5,000	48	\$200,000	\$123,815
Condensing Heat Recovery	Charlton		1,593,220	3,186	\$3,450,000	\$597,298
Battery Electric Storage	Charlton				\$100,000	\$400,00
OR Unoccupied Setbacks	Charlton	450	75,000	168	\$250,000	\$86,618
Existing Building Commissioning, ISO 50001 Ready, EEBO Staff Training and BOMA Best/Energy Star Canada *	Charlton King St West 5th.	150	15,000	36	\$75,000	\$25,124
<b>TOTAL</b>		<b>5,040</b>	<b>1,688,220</b>	<b>3,578</b>	<b>7,055,759</b>	<b>1,286,044</b>

\*: Multiple initiatives (i.e. HE AHU filters, coil cleaning, compressed air leak survey etc.), training, employee engagement and initiate a limited energy management system

### Results

#### 2019 Data

Facility	Address	Electricity [kWh]	Natural Gas [m <sup>3</sup> ]	GHG Emissions [kg CO <sub>2</sub> ]	Energy Use Intensity [GJ/m <sup>2</sup> ]
Charlton Campus	50 Charlton Ave. E.	30,475,856	4,890,464	10,174,734	2.552
West 5 <sup>th</sup>	100 West 5 <sup>th</sup>	12,613,825	1,518,127	3,254,593	1.301
King Campus	2757 King St. E.	3,501,725	604,362	1,249,331	3.609
<b>Total</b>		<b>46,591,406</b>	<b>7,012,953</b>	<b>14,678,658</b>	<b>2.118</b>

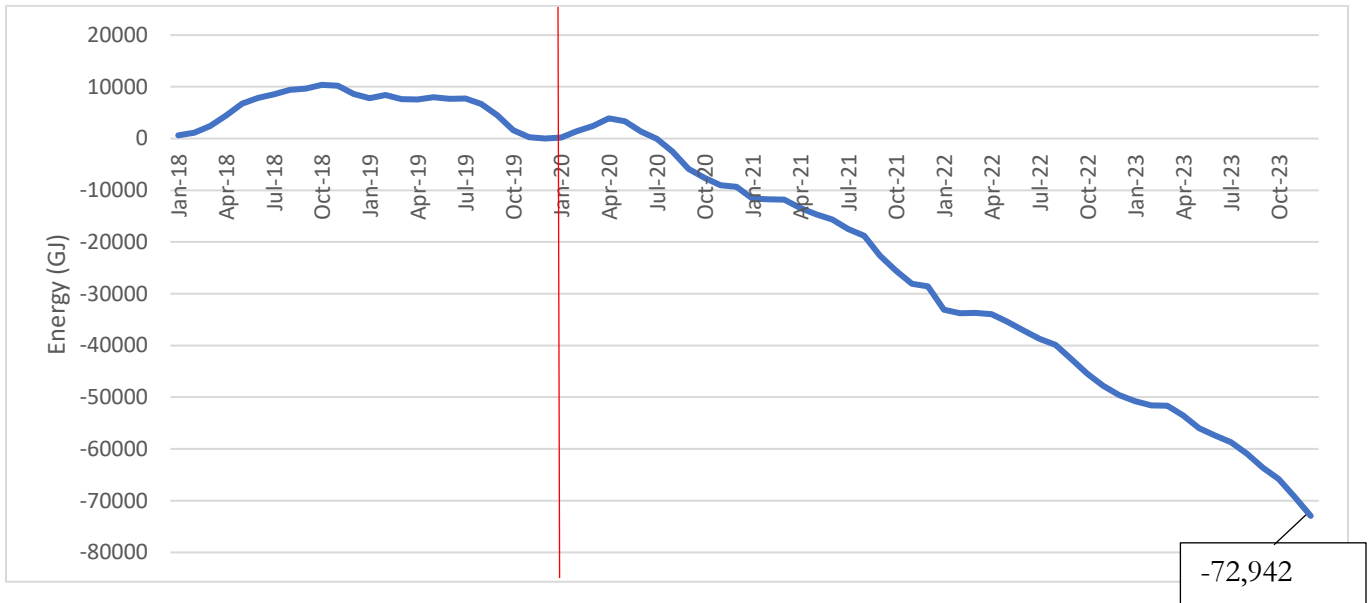
2023 Data

Facility	Address	Electricity [kWh]	Natural Gas [m3]	GHG Emissions [kg CO2]	Energy Use Intensity [GJ/m <sup>2</sup> ]
Charlton Campus	50 Charlton Ave. E.	30,068,726	4,134,648	8,738,345	2.308
West 5 <sup>th</sup>	100 West 5 <sup>th</sup>	12,193,018	1,355,197	2,936,596	1.259
King Campus	2757 King St. E.	3,339,890	562,932	1,166,352	3.262
<b>Total</b>		<b>45,601,634</b>	<b>6,052,777</b>	<b>12,841,290</b>	<b>1.938</b>

From the above data, it may be seen that utility consumption, energy use intensity and GHG emissions are all trending down as a result of the initiatives implemented from 2020 through 2023 and continuing in 2024.

Energy savings may be calculated by means of Cumulative Sum analysis and weather normalization. Below is a Cumulative Sum (CUSUM) graph that represent the savings obtained starting in 2020. Weather Normalized regression analysis is the starting point for the analysis. The consumption difference between actual energy consumption and the regression predicted values provides a robust means of identifying changes in energy consumption. Positive, increasing values indicates over-consumption or poor performance. Negative, decreasing values indicate improvement or savings. Operating 'status quo' is represented by a flat line.

Charlton/West 5<sup>th</sup>/King St – Total Energy Consumption (GJ) CUSUM



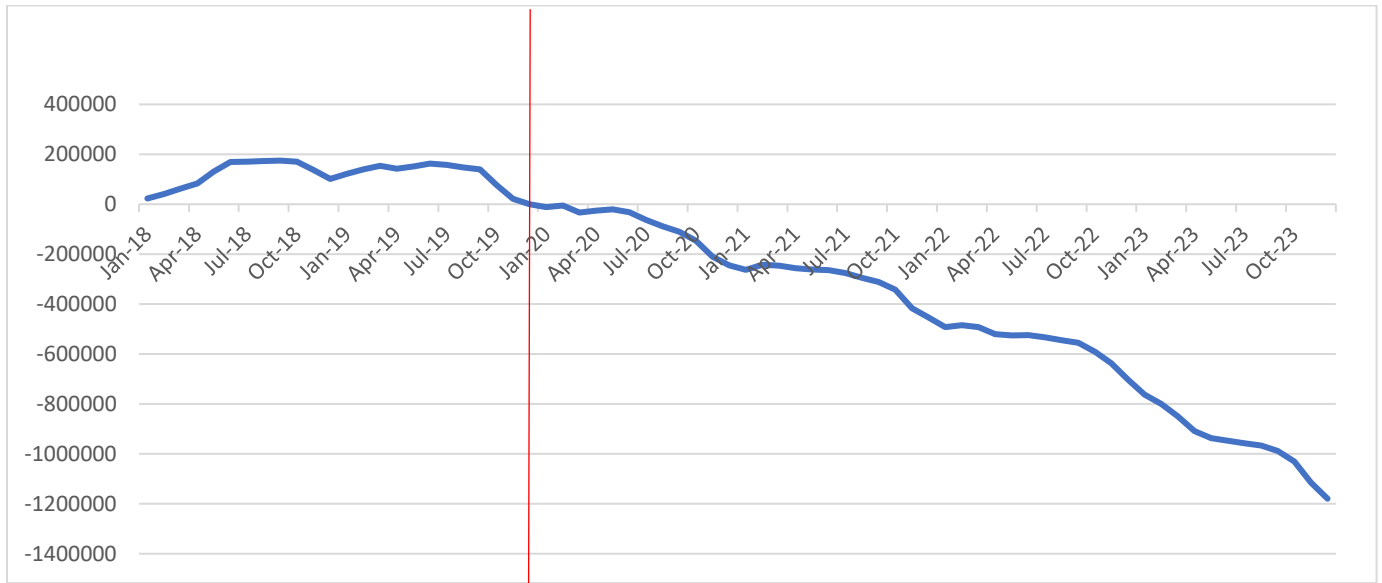
The cumulative energy savings and resulting GHG emissions reduction is the equivalent of taking 1,505 cars off the road for one year.

The West 5<sup>th</sup> site is a much newer building and is a part of an Alternative Finance & Procurement (P3) contract with Plenary Group. The hospital continues to be one of the most energy efficient in Ontario as may be seen by the low Energy Use Intensity (EUI) value of 1.259 GJ/m<sup>2</sup>.

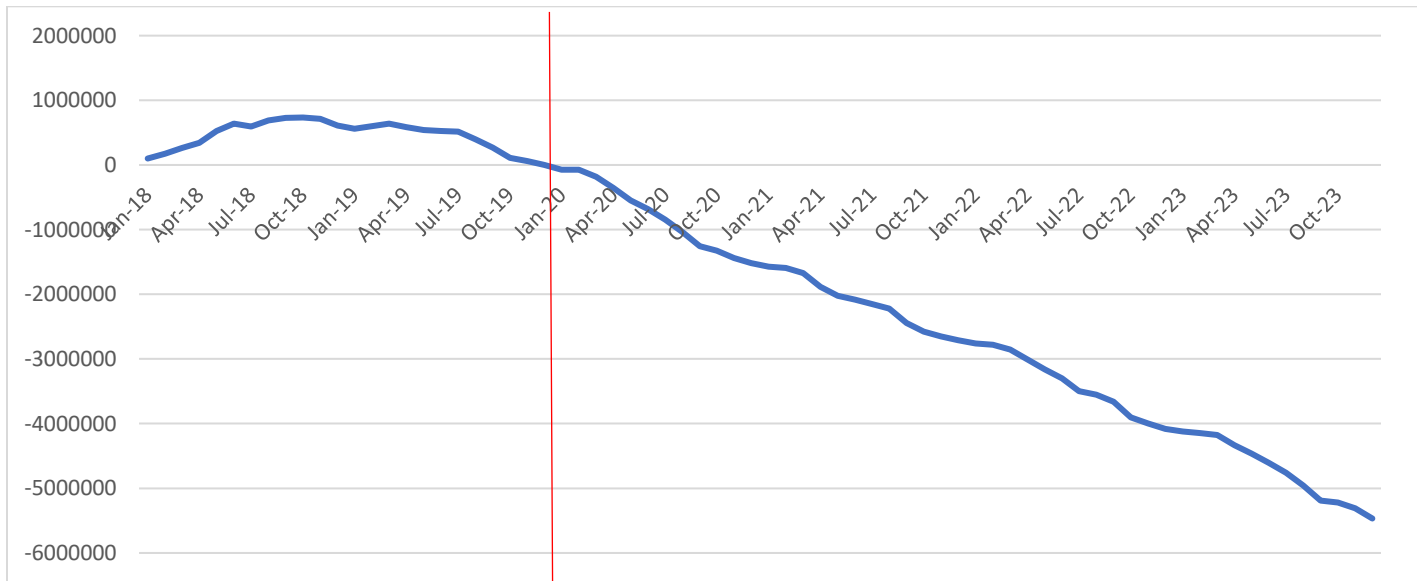
The King St. Campus is significantly smaller than the other sites but has a greater EUI. Our goal is to install LED lighting throughout this location and improve the Building Automation System (BAS) operation to maintain employee and patient comfort. Decreasing the number of operator override decisions via improved BAS logic will reduce the site EUI.

Energy consumption reduction activities have focused on the Charlton Campus as approximately 70% of the natural gas and 65% of the electricity is used at this acute, academic hospital location.

Charlton Campus – Natural Gas (m<sup>3</sup>) CUSUM



Charlton Campus – Electricity (kWh) CUSUM



St. Joseph's Healthcare Hamilton has seen a significant decrease in electricity and natural gas consumption at the main site (50 Charlton Ave E) since 2020 primarily driven by the prior noted completed measures.

## Next Steps: 40% Reduction in GHG Emissions by 2030, Continuous Improvement and Renewables

### 40% Reduction in GHG Emissions by 2030

Implementation of proposed measures will reduce GHG emissions in line with the federal Canadian Net-Zero Emissions Accountability Act. A major initiative is underway at the Charlton Campus to install a Condensing Heat Recovery system at the boiler plant.

### Continuous Improvement

Healthcare is a continuously evolving environment where energy efficiency will quickly vanish if not monitored and maintained. Staff engagement (“Green Team”) and training are key initiatives to maintain and improve energy efficiency and sustainability.

### Renewables

The Energy Demand from the Hospital will not go away. In order to reduce our demand from ‘the grid’, we will investigate and incorporate where feasible renewable energy into our supply mix. This may include the installation of solar Photovoltaic and Battery Electric Storage. These projects require careful analysis, due to their long lifespans projected to last 25+ years.