

ENERGY CONSERVATION AND DEMAND MANAGEMENT PLAN 2020 – 2024

Overview

St. Joseph's Healthcare Hamilton's Energy Conservation Plan provides a summary of accomplishments to date and projects planned in order to continue on our path to a greener Hospital. It is our goal to continuously improve our resource management; from our Healthcare practices to our Energy consumption.

As a Broader Public Sector (BPS) organization, St. Joseph's Healthcare Hamilton is required to develop a Conservation and Demand Management (CDM) Plan and update it every 5 years. This plan fulfills that requirement and was developed in compliance with O.Reg 507/18 (formerly 397/11). The plan has been reviewed and approved by senior management.

Goals & Objectives

Our goal as an organization is to reduce maintenance, increase reliability, improve patient & staff comfort and, of course, reduce energy. We aim to manage our Building Services & Utilities budget by performing the preventative maintenance tasks needed to eliminate sudden and costly breakdowns. In addition, we are continuously scanning our Building Automation System (BAS) for improvement opportunities and for anomalies that will drive up consumption.

Completed Measures

The following projects were completed over the last 5 years resulting in 3,122 MWh/yr & 808,700 m³/yr of savings; equivalent to removing 350 homes from the grid.

Project	Location	Annual Savings		Estimated Lifespan
		Electricity	Natural Gas	
High Efficiency (HE) Filters	Charlton Campus	170 MWh		2
Building Automation System Recommissioning*	Charlton Campus	1,038 MWh	192,670 m ³	10
Corridor Lighting	Charlton Campus	294 MWh		15
Parking Garage Lighting	Charlton Campus	202 MWh		15
Garage CO Exhaust	Charlton Campus	191 MWh		15
Boiler Economizer (x2)	Charlton Campus		220,000 m ³	15
Chiller Recommissioning	Charlton Campus	384 MWh		10
Cafeteria Window Replacement	Charlton Campus	4 MWh	5,820 m ³	35
Steam Trap Replacement/Line Insulation	Charlton Campus		330,440 m ³	5
Blowdown Heat Exchanger	Charlton Campus		11,870 m ³	15

Recirculation Dampers	Charlton Campus	12 MWh	29,420 m ³	15
Fontbonne Chiller	Charlton Campus	515 MWh		25
HE Dishwasher	Charlton Campus		18,480 m ³	15
BAS Recommissioning*	King St	146 MWh		10
Corridor Lighting	King St	83 MWh		15
HE Filters	King St	75 MWh		2
Parking Lot Lighting	King St	8 MWh		25

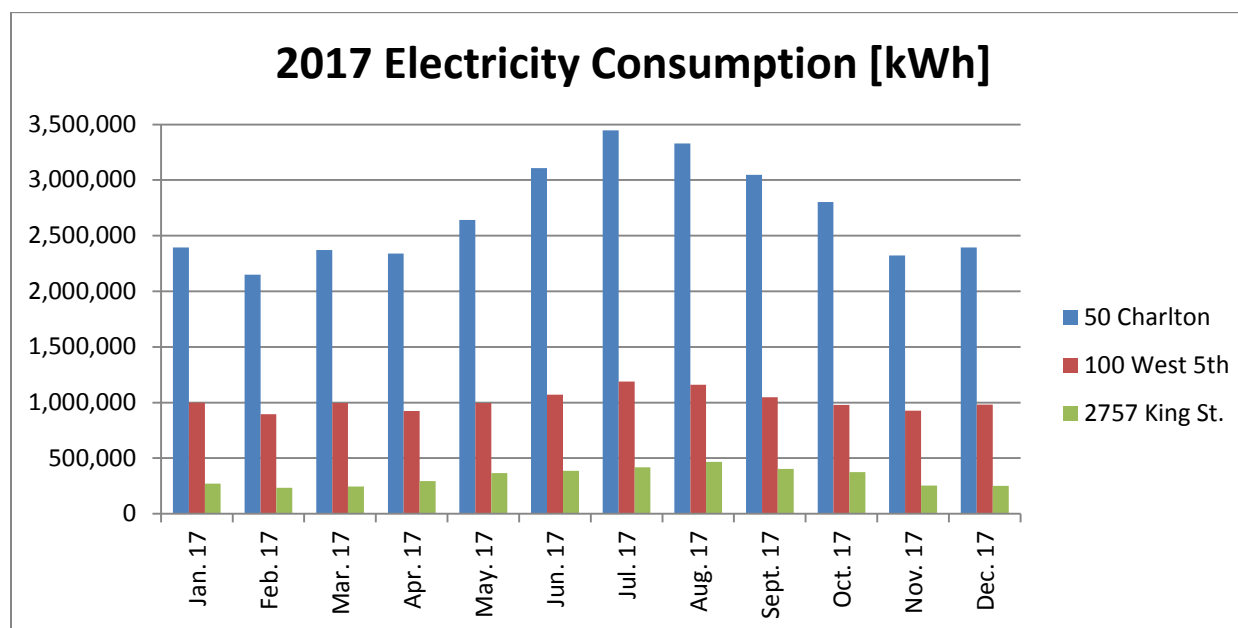
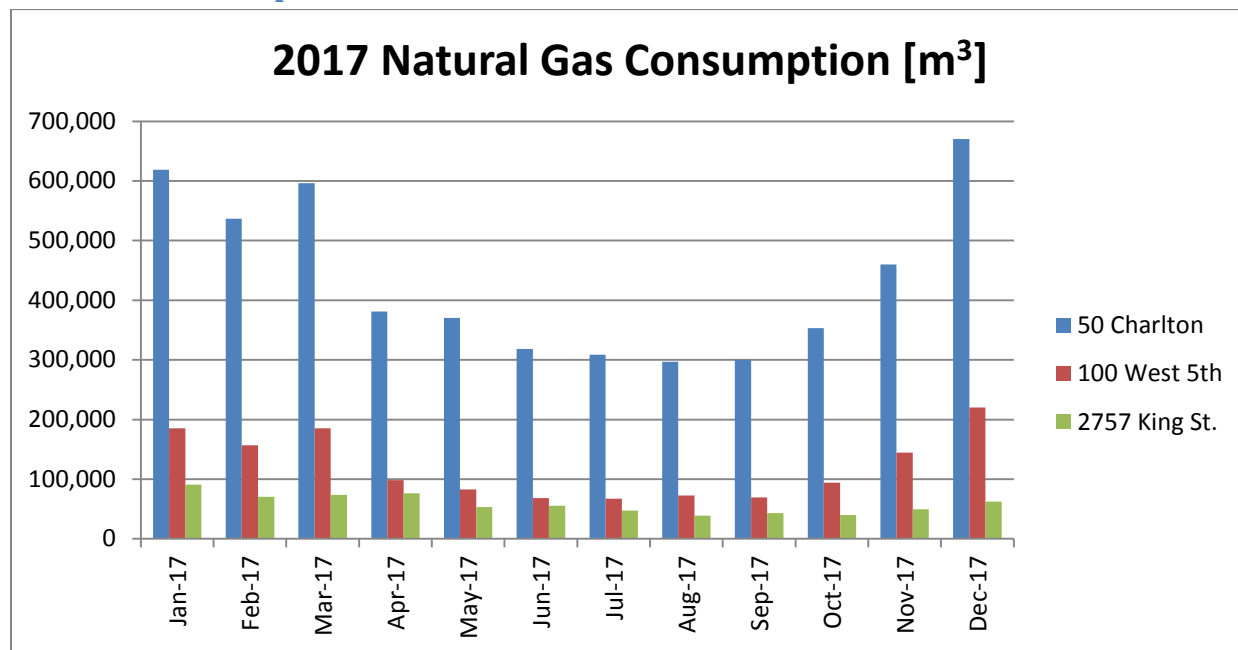
Proposed Measures

The following proposed projects, many of which are underway, will continue St. Joseph's Healthcare Hamilton on its path to a greener Hospital over the next 5 years. The projected annual savings are; 1,677 MWh & 320,640 m³

Project	Location	Projected Annual Savings		Estimated Cost	Estimated Lifespan
		Electricity	Natural Gas		
Room LEDs	Charlton Campus	229 MWh		\$25,000	15
BAS Recommissioning*	Charlton Campus	500 MWh	45,000 m ³	\$0	10
VFD Installations	Charlton Campus	220 MWh	30,000 m ³	\$30,000	15
Exterior Signs & Lighting	Charlton Campus	20 MWh		\$18,000	15
Entrance Air Barriers	Charlton Campus	119 MWh	67,300 m ³	\$18,000	15
Air Compressor Leak Surveys	Charlton Campus	100 MWh		\$10,000	5
Daylight Sensors	Charlton Campus	15 MWh		\$15,000	15
Exhaust/Fume Hood Controls	Charlton Campus	30 MWh		\$25,000	15
OR Unoccupied Setbacks	Charlton Campus	334 MWh	164,340 m ³	\$580,000	15
Room LEDs	King St	22 MWh		\$2,500	15
Exterior Signs & Lighting	King St	13 MWh		\$12,000	15
Chiller Optimization	King St	65 MWh		\$2,000	10
Linkageless Controls	King St		14,000 m ³	\$10,000	15
Lights Off Campaign	All Sites	10 MWh		\$0	1

*BAS Recommissioning is composed of multiple measures: discharge temperature reset strategies, AHU pressure/VFD reductions, scheduling & setbacks, reducing pump enable setpoints, recirculation dampers, and enthalpy wheel operation.

Historic Consumption



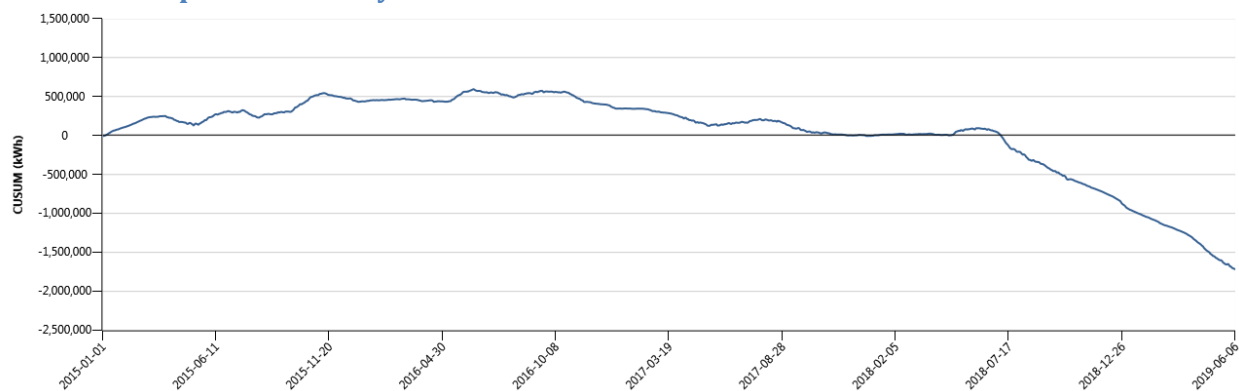
2017 Data

Facility	Address	Electricity [kWh]	Natural Gas [m3]	GHG Emissions [kg CO2]	Energy Intensity [ekWh/ft2]
Charlton Campus	50 Charlton Ave. E.	32,343,927	5,218,231	10,425,213	70.15
West 5 th	100 West 5 th	12,161,789	1,447,371	2,946,813	32.18
King Campus	2757 King St. E.	3,957,316	701,030	1,393,840	107.06

Results

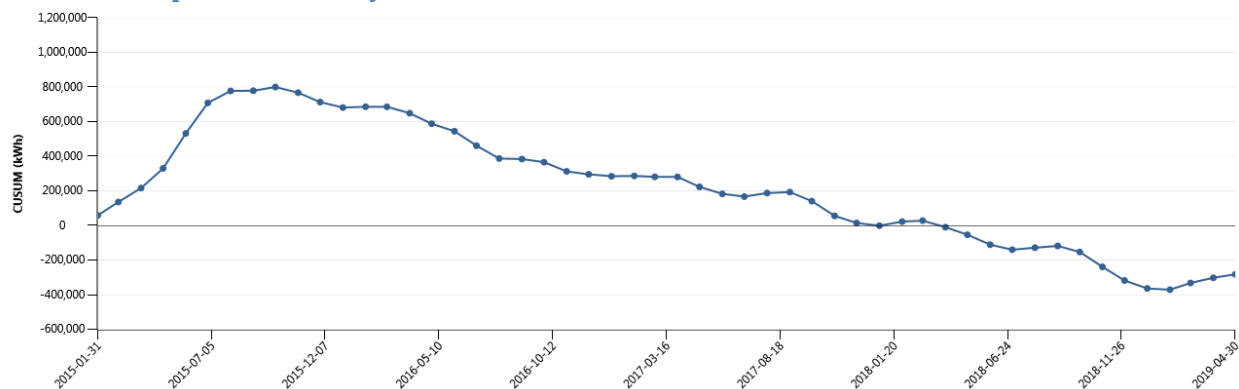
Below is a series of Cumulative Sum (CUSUM) graphs that represent the savings obtained starting in 2018, which coincide with the commencement of our new Energy Manager and the aforementioned completed measures. A CUSUM graph begins with a Weather Normalized regression analysis of the key driving forces for energy (namely weather). The consumption variance away from what the regression analysis predicts will translate to upturns (over-consumption or poor performance) or downturns (improvements). Operating 'status quo' would be represented by a flat line.

Charlton Campus - Electricity CUSUM



St. Joseph's Healthcare Hamilton has seen a considerable downturn in energy consumption at the main site (50 Charlton Ave E) in 2018 primarily driven by the prior noted completed measures.

West 5th Campus - Electricity CUSUM



The West 5th site is a much newer building and is a part of an Alternative Finance & Procurement contract with Plenary Group. When the new building was in its infancy, the consumption was not well controlled. Plenary utilizes their contract with Honeywell for building maintenance and control and Honeywell has been working diligently to continue to reduce the consumption. This is now a top performing Hospital in Ontario.

King Campus – Electricity CUSUM



The King St. Campus is significantly smaller than the other sites. The small size means that breakdowns, failures or poor operator decisions have greater impacts to the overall variability in consumption at the site. We are working on installing LED lighting throughout this location and reprogramming the Building Automation System to maintain employee and patient comfort while removing the variability inherent with Operator overrides and decisions.

Renewable Energy Projects

We have been investigating the feasibility of installing Solar PV on some of our open land. The decision has been narrowed between carport style and solar tracking systems. This requires careful consideration due to the future implications of the installation, projected to last 25+ years.