

2019 UPDATE TO THE FIVE-YEAR CONSERVATION AND DEMAND MANAGEMENT (CDM) PLAN

FORMERLY STRATEGIC ENERGY MANAGEMENT PLAN (SEMP) FOR 2013-2018



Introduction

When Holland Bloorview opened in February 2006, it was recognized by the International Academy for Design and Health. Many “green” features are present in this state-of-the art facility. Some of these features include the 52kW solar panel installation for green energy production; a 157,000 litre collection system to collect roof rainwater and re-use it for irrigation; low “e” windows; variable speed drives for all fans and pumps and a low voltage lighting control system. The facility was truly designed with conservation as one its goals.

The overall purpose of Holland Bloorview Kids Rehabilitation Hospital’s energy management plan and policies is to promote good stewardship of our environment and community resources. In keeping with our core values of Efficiency and Financial Responsibility, Holland Bloorview Kids Rehabilitation Hospital’s energy management program will continue to assist in the reduction of operating costs and enable us to provide a high level of quality service to a greater number of children in the community. In 2013, the Strategic Energy Management Plan placed Holland Bloorview Kids Rehabilitation Hospital in compliance with Ontario Regulation 397/11.

On January 1, 2019, the Green Energy Act, 2009 was repealed, along with its regulations. Select conservation and energy efficiency initiatives, such as the BPS energy reporting regulation, were moved to the Electricity Act, 1998. O. Reg. 397/11 (Energy Conservation and Demand Management Plans) was replaced by O. Reg. 507/18 (Broader Public Sector: Energy Reporting and Conservation and Demand Management Plans). No changes were made to the regulation when it was replaced.

CDM Results

- A) Annual energy consumption during the last year for which complete information is available for a full year (2017) and reported on the Broader Public Sector (BPS) portal**
- Utility and energy related costs remain a significant part of overall operating costs
 - Utility costs in 2013 were approximately \$1.27 million dollars annually.
 - ***In 2019 these costs have been reduced to under \$1.15 million dollars through many energy saving retrofits. Despite the rise in utility costs, we have been able to significantly reduce our utility expenditures and divert this funding to patient care.***
 - ***The Hospital’s Energy Use Index (EUI) (annual energy demand) in 2013 was 50.80086 ekWh/ft² and produced 2,504,363 kg of Green House Gas (GHG) emissions.***
 - ***In for 2017/18, our facility consumed 39.6172 ekWh/ft².and produced 1,706,137 kg GHG.***

- **The 5 year results identified in the following graph illustrate the progress made with a 32% reduction in kg of GHG produced and a 22% reduction of kWh/ft2:**

Year	GHG Emissions (Kg)	Energy Intensity (ekWh/sqft)
2013	2,504,363	50.80086
2014	2,314,690	51.6776
2015	2,060,067	47.28415
2016	1,830,112	42.78224
2017	1,706,137	39.6172

B) Goals & objectives

- To conserve and reduce energy consumption within the hospital, we will continue to utilize new technology (ie. LED 347V fixtures) to add to the overall efficiency of the hospital.
- To continue to re-invest revenue from various industry rebates to offset the cost of new projects with reasonable payback time periods (ie. less than 2 years)
- To monitor utilities used and address any fluctuation in abnormal usage.

C) Actual results

- **Proof of our efforts between 2013 and 2018 are outlined below:**

Hydro use has steadily declined from 2013 through 2018:

2013/14 = 7,714,967 kWh consumed

2014/15 = 7,181,135 kWh consumed

2015/16 = 6,913,735 kWh consumed

2016/17 = 6,367,176 kWh consumed

2017/18 = 6,049,445 kWh consumed



Current and Proposed Measures

2019 and Beyond

Our facility is now 13 years old. Active management of energy related costs and risks continues to provide a significant economic return to the organization and will support other key organizational objectives. Planning for upgrading activity associated with energy management began in 2009

The Facility Management team takes great pride in the operation of the building. Along with the maintaining the safety and comfort of our clients, families and staff, improving the energy efficiency in all areas of operations is our mandate.

The work accomplished by the Building Services Team has kept the original goal of energy conservation as important today as it was during design and construction. Recent activity has included a variety of initiatives within the facility as well as on the entire property. Lighting retrofits have had the largest focus and impact on net savings to our energy spending.

Forecast of expected results

With energy management continuing as an integral part of business decisions, Holland Bloorview Kids Rehabilitation Hospital will endeavor to achieve the following between 2019 & 2023:

- ***1 to 2 % reduction in energy use***
- ***\$20,000 annually in savings to help offset expected cost increases for utilities***

Cost and savings estimates for CDM measures

- ***Utility costs at the end of 2017/18 were \$1,019,426, a savings of \$251,000 compared to 2013 spending or a savings of 20%, not taking into account inflation and escalating hydro costs.***
- ***These savings were used to fund various other accounts over the 5 year period and also assist with continued reductions in funding from the Ministry.***
- ***Extensive Financial Optimization plans were completed by all hospital departments to offset reduced funding each year.***
- ***This is a savings of 1,665,522 kWh comparing usage in 2013/14 with 2017/18 or nearly 22% of consumption over 5 years.***

Time frame for CDM Plan

Facility Management is proud of the energy savings efforts achieved between 2013 and 2018. We will continue to seek new opportunities in 2019 through 2023.

Our facility will carry out the CDM through 2023 and beyond.

Proposed Operating Cost & Space changes over the next 5 years

- *Facility related Operations and Maintenance (O&M) costs were \$1.36 million dollars annually in 2013*
- *For 2019, O&M costs are budgeted at approximately \$1.5 million dollars annually.*
- *Facility capital project costs were projected at \$1.5 million over 5 years in 2013*
- *These costs were greatly exceeded in 2016, 2017 and 2018 due to required repairs to air intake plenum spaces, window leak issues as well as replacement of our west zinc roof. These costs were due to construction deficiencies and the hospital has undertaken legal action to recover the costs.*
- *For 2019, capital costs for the new research MRI suite are projected to be \$5,000,000. Energy costs related to the operation of the suite will be paid for by the Bloorview Research Institute. We will partner with them to help keep costs at a minimum.*
- *For the years 2020, 2021 and 2022, a 10,000 ft² expansion for the Bloorview Research Institute is planned. Facility Management is part of the planning process and will help ensure energy efficiency is built into the new environment.*



Business Plan

Holland Bloorview Kids Rehabilitation Hospital opened in 2006 as a state of the art facility. Many energy-efficient systems were designed into the facility, and Facility Management staff have worked over the last 13 years to maintain and improve/update these systems.

Since our opening day, many energy reducing initiatives were implemented.

If energy management considerations are integral to relevant business practices, policies, procedures and decision-making processes, Holland Bloorview Kids Rehabilitation Hospital's energy and utility related consumption will continue to be reduced between 1 to 2 % per year

over the next five year period. Assuming commodity costs remain stable, these savings can be utilized for other needs within the facility.

Based on 2019 utility rates, this will result in approximately \$15,000 in annual value to the bottom line based, or a total \$75,000 over a 5-year period. Continued integration of energy management into organizational decision making and business practices will continue to produce value annually for a much longer period of time. We have achieved very good energy savings opportunities between 2013 and 2018. In reality, we have few options left to improve the facility's infrastructure that provide a minimal investment and reasonable payback time.

2019 Update to the Business Plan

- ***During the last 5 years, the Facility Management Team has partnered with Toronto Hydro, Enbridge, Johnson Controls and George Brown College on a number of projects.***
- ***2014: Various LED retrofits such as elevators, 0W220 conference room***
- ***2015: when did we change the in-wall lights at cafeteria & front & mound lights***
- ***2016: Constant Air Volume (CAV) to Variable Air Volume (VAV) conversion for selected air handling units; rebates received from TO Hydro + Enbridge***
- ***2017: Steam Trap 3rd party energy efficiency analysis; upgrade of steam traps; rebate received from Enbridge. LED Parking lot lighting retrofit project***
- ***2018: Variable Frequency Drive (VFD) upgrade project with Toronto Hydro assistance and rebate. LED internal lighting upgrade project.***
- ***Holland Bloorview Kids Rehabilitation Hospital will continue to invest capital funding into the newest proven technology to assist the Facility Management team's pursuit of energy savings.***
- ***Government funding has been, and will continue to be, integral to our planning. Rebates received for proven savings will be re-invested in future projects.***

BASELINE ENERGY USE

The baseline energy profile was selected using 2013 data for the original SEMP report.. For this 2019 CDM update, the Ministry of the Environment, Conservation and Parks continues to require annual reports on hydro & natural gas consumption. The Ontario Hospital Association (OHA) also requires energy and waste reporting data annually. We continue to be awarded "silver" recognition for our hospital's efforts. We have participated in this Green Hospital Scorecard since 2014.

KEY OBSERVATIONS:

- **The total utility costs for calendar year 2013 were:
Natural Gas: \$251,863; Hydro: \$941,159; Water & Sewer: \$81,356
*2018/19 budgeted amounts are:
Natural Gas \$213,000; Hydro: \$1,039,087; Water & Sewer: \$96,206.***
- ***Hydro consumption was reduced 22 % between 2013 and 2018/19***

- **Boiler efficiency upgrades in 2012 and our CAV/VAV project in 2016 have assisted with our reduction in natural gas usage.**
- Revenue from Toronto Hydro for our 52 kWh solar installation rebate under the Ontario Power Authority's FIT Program remains steady, in the \$40,000 range. Our system consists of a 39 kW capacity system on our east roof and a 13 kW capacity system on our west roof. Hydro produced is used on-site.
- Rainwater collected from the roof areas, balconies and from the north side of the building in an underground tank with a capacity of 114,000 litres. The water is pumped into the facility's underground irrigation system for use in the perennial beds and turf areas. The system will continue to help save costs on water/sewer charges and assist in our water conservation stewardship for the healthcare system.
- A 5 kW solar array is in operation on our exterior storage building. The small amount of hydro produced is used on-site; it is not part of the FIT program as it is not metered.
- **Sewer rebate from the city of Toronto for consumed water evaporated for cooling/steam processes will be 20.9 % for 2019/20**
- The facility has two swimming pools that require circulation & heating/cooling 24/7
- The 5th floor has ten motel units for parent rental; coin operated laundry and main kitchen available 24/7. Units require 24/7 ventilation & heating for 5 west.



Generation


The sleek array of 60 Mitsubishi Photovoltaic modules shown above produces 13 kW of solar power on our west sloped roof. A 39 kW solar array is situated on the East penthouse roof. These 2 arrays feed into a 50 kW inverter, earning solar revenue for Holland Bloorview. The estimated revenue from this system is \$ 40,000 per year. Estimated kWh of production is between 57,000 and 60,000 annually. Energy recovered is used within the facility.

Holland Bloorview's contract to receive its solar rebate from Toronto Hydro is in place until March 2028.

Holland Bloorview is currently in exploratory discussions with Noventa Energy Partners regarding a project involving energy capture from waste water.

This CDM Plan will be published on Holland Bloorview's website and will be available in printed form, upon request, in the Facility Management Department.

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Energy Management Program Vision

Our Mission at Holland Bloorview Kids Rehabilitation Hospital is to provide specialized programs and clinical care for children and youth with rehabilitation and complex care needs to enable them to participate in life to the fullest.

We are Canada's leading pediatric rehabilitation teaching hospital, dedicated to being at the forefront of clinical care, research and education. As a key resource for Ontario, we are committed to partnerships to build clinical, academic and community capacity to enhance the quality of life for children with rehabilitation and complex care needs and their families.

Our Vision is a World of Possibility.

We strive to operate our facility in an environmentally responsible manner through the efficient use of utilities. We are effectively serving our clients and the community by redirecting energy savings and limited resources towards client care and effectively meeting increasing service expectations.