



CAMPBELLFORD
MEMORIAL HOSPITAL

Conservation and Demand Management Plan

www.cmh.ca
2014

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Message from the President and CEO

At CMH, we believe that it is incumbent upon healthcare providers to take a leadership role in reducing our carbon footprint. We must do the things within our control to contribute to the overall wellbeing of the planet, our communities, and our citizens. CMH has been conscious and pro-active on matters relating to the use of resources (particularly energy) for a long time. We shall continue to do so.

I approve this Conservation and Demand Management Plan



Brad Hilker,

President and Chief Executive Officer,

Campbellford Memorial Hospital.

Executive Summary

The following Energy Conservation and Demand Management plan is written in accordance with section 6 and 7 of the green energy act, 2009 and Ontario Regulation 397/11. Energy management initiatives can produce environmental, economic and social benefits, including reducing greenhouse gas (GHG) emissions, cost avoidance and increased savings. As concerns surrounding energy availability and costs continue to rise, an energy management plan is a proactive step toward an effective long term solution. Along with these benefits, energy efficiencies also promote local economic development opportunities, energy system reliability, and reduce price volatility. Our energy efficient capital and operating process improvements are key factors to our success and will be outlined in the report. The people at Campbellford Memorial Hospital are committed to a path of sustainability in all aspects of our healthcare facility.

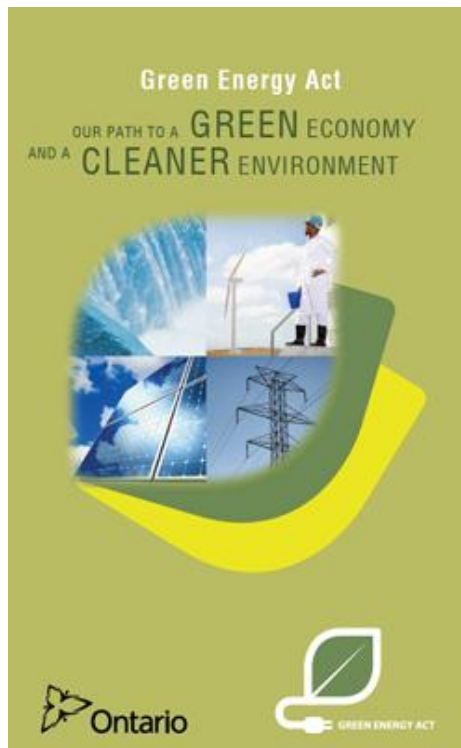
Our mission

Campbellford Memorial Hospital is dedicated to relief of illness, pain and suffering, and to promotion of health, for the communities we serve.

We recognize the critical relationship between environmental health and public health. We aim to limit any impact upon the environment resulting from the operation of our health care facility. Implementing a strategic energy management plan will address the interconnected issues of indoor environmental quality, energy use, and operational efficiency. Our goal is to maximize energy efficiency and reduce waste/pollutants wherever we can.

Green Energy Act

Ontario's Green Energy Act (GEA) was created to expand renewable energy generation, encourage energy conservation and promote the creation of clean energy jobs.



The GEA promotes conservation by;

- Making energy efficiency a key element of Ontario's building code.
- Creating new energy efficiency standards for household appliances.
- Working with local utilities to reach assigned conservation targets.
- Protecting low-income Ontarians through targeted conservation programs.

Energy Consumption & Greenhouse Gas Emission Reporting

As required by Ontario regulation 397/11. The hospital reported the following usage figures to the Ministry of Energy.

Energy consumption as reported to the Ministry of Energy			
year	Electricity (Kwh)*	Natural gas(Cu m)	fuel oil (litre)
2011	1,840,181.00	311,434.00	1,000.00
2012	1,871,915.00	296,266.00	2,300.00
Intensity			Emissions
Year	EKWH/sq. ft.	JG/Sq. m.	GHG (Kg)
2011	57.43	2.22	738,747.42
2012	56.15	2.17	746,198.30

* amount after energy used at the lodge is sub-metered.

Introduction

The purpose of Campbellford Memorial Hospital's energy management plan is to promote sustainable stewardship of our environment and community resources. This is in keeping with our core values of system efficiency and financial responsibility. We keep in mind our mission as we make changes.

The hospital will strive to fully integrate energy management into our practices.

Facility Description

Faculty Information	
Name	Campbellford Memorial Hospital
Type of facility	acute care hospital
Address	146 Oliver Road, Campbellford, Ontario K0L 1L0
Building year built	1953, 1971, 1985
Number of floors	four
gross area	89,856 sq. ft. (8,348 sq. metres)
hours of operation	24 hour
space heating	gas fired hot water boilers (oil backup)
Process heating	gas fired steam generators (oil backup)
Domestic water heating	hot water and steam
Gas supplier	Enbridge
Electrical supplier	Hydro One
Water supplier	Municipality of Trent hills

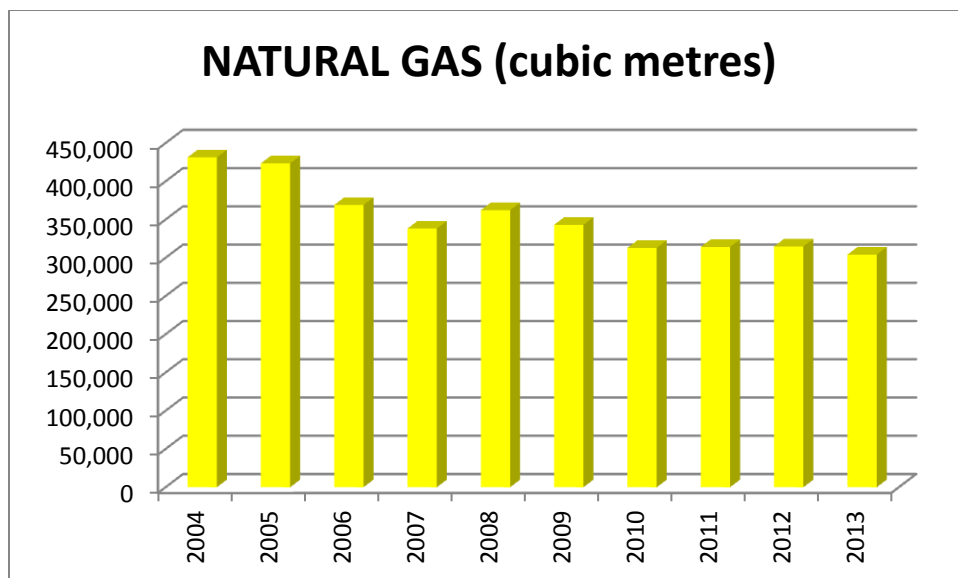
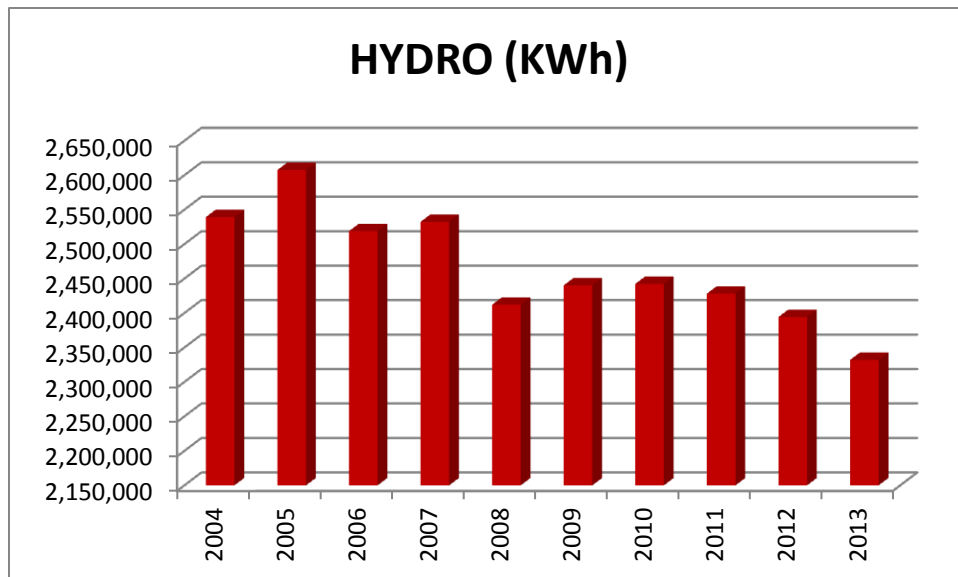
Energy Commodities Management

Energy Management refers to both how energy is purchased and how energy is used. An important aspect of energy management is putting in place an adaptable energy procurement strategy to manage the always fluctuating spot market commodity prices. This is done by grouping with other similar institutions to buy large block purchases of a particular commodity. CMH through the HealthPRO group has partnered with ECNG Energy Consultants since the mid 1990s to purchase Natural gas. In 2006, we joined the group to purchase electricity.

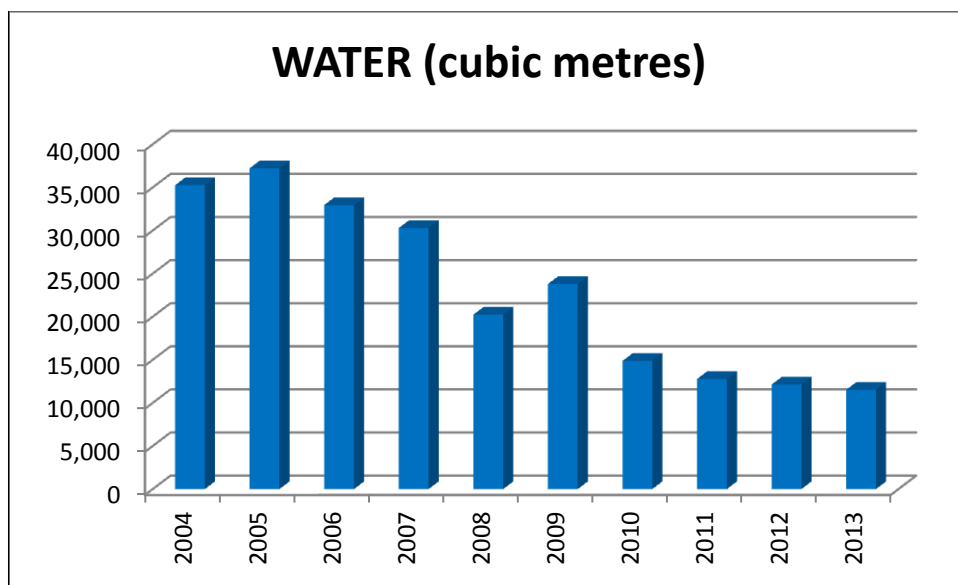


Commodities purchased

The two following graphs show the actual quantities of hydro and gas, purchased by CMH from 2004 to 2013. Hydro includes the amount sub-metered to the Multicare Lodge. Gas and hydro requirements may vary month to month and year to year due to the weather conditions. Hydro is affected by cooling requirements in the summer and gas by heating requirements in winter (see graphs for heating and cooling degree days)



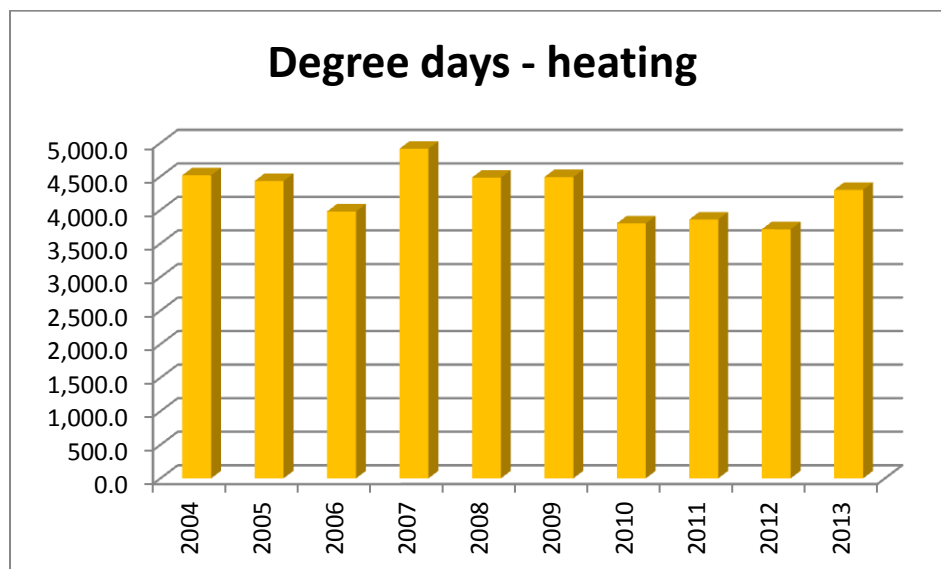
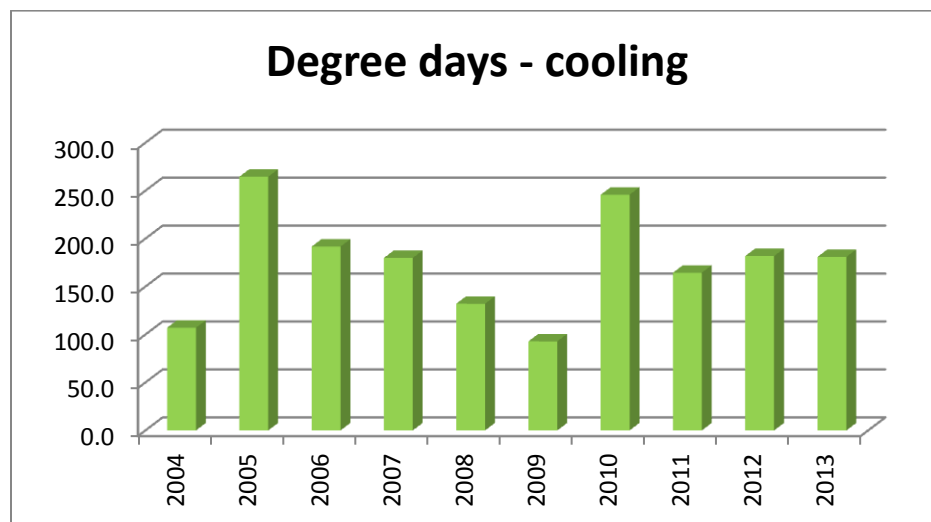
Water consumption has been significantly reduced since 2005 with corrective measures and process improvements such as the replacement of the old liquid ring pumps that were being used for medical air and vacuum.



Adjustments

When comparing energy data one has to keep in mind that there are many factors to consider. Things like weather, changes in building use, adding/removing machines or equipment, increases /decreases in populations using the building can have significant effects.

Degree day is used to adjust comparative data, as well, it is used in design calculations for new projects. It is a measurement designed to reflect the demand for energy needed to heat or cool a building. It is derived from measurements of outside air compared to a comfortable inside temperature, 18 degrees Celsius in this case. The outside air temperature for these graphs is taken at Peterborough.



Past Activity

Capital Projects

We entered into a business partnership with MCW Custom Energy Solutions in 2007 to complete selected projects that both saved energy and provided renewal and upgrading of critical infrastructure. An example of this would be the replacement of the air conditioning and air supply system for our Operating Rooms. The project was designed to meet all the current standards for O.Rs, be as energy efficient as possible, and be environmentally friendly.

Pages 11 and 12 show the performance results for the 2011-12 and 2012-13 fiscal years.

Operational

Hospital engineering staff looks for opportunities to reduce energy and water costs as a matter of routine.

This includes:

- Finding and repairing water leaks.
- Replacing motors when they fail with new high efficiency motors.
- Replacing failed water cooled AC systems with air cooled units where ever possible.
- Installing motion sensors to turn lights on only when required.
- Refining control strategies within the building automation system

Communication

Page 13 is an example of communications on energy use to the staff through our weekly newsletter.

Energy Measures Implemented

The following energy conservation measures were implemented

- Lighting Redesign/Retrofit
- Lighting occupancy sensors installation
- Hot water heating boilers controls retrofit & link 1969 and 1985 heating plants
- Installation of high efficiency steam generators as well as repair steam traps/condensate piping
- Modifications to domestic hot water heating & storage
- Implementation of heat recovery on new AH2
- DDC upgrade and expansion, replacement of pneumatic valve & damper actuators
- Building envelope improvements
- Installation of low flow domestic water fixtures

Savings Achieved

The graphs shown below provide a summary of the anticipated savings versus monitored savings. The current reporting period spans April 2011 to March 2012. The actual cost savings are performing above the anticipated cost savings targets. Monthly utility data show a gradual unexplained increase in electricity usage commencing in April 2011 which requires further investigation but which would appear to be due to an operational change.

Annual Savings Anticipated

The annual anticipated savings are \$80,600. This reporting period represents the fifth full monitored year of performance. Year to date cost savings have exceeded the anticipated target.



Custom Energy Solutions Ltd.

207 Queen's Quay, Suite 615

Toronto, ON M5J 1A7

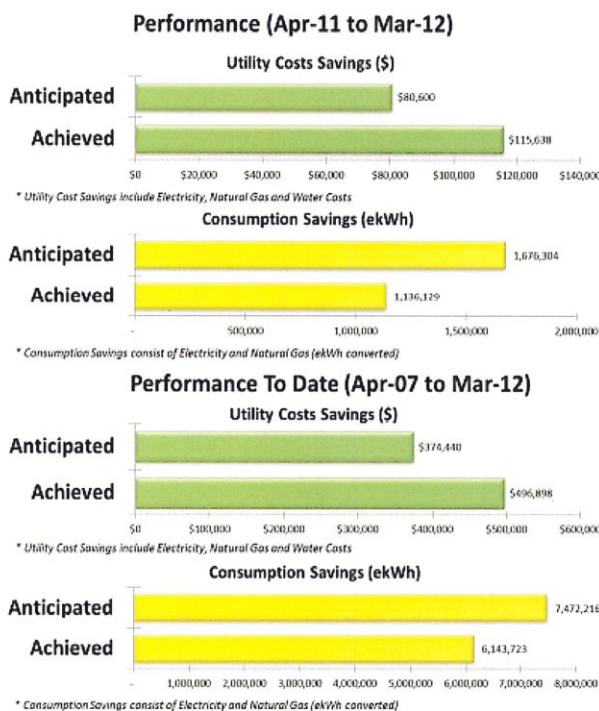
Phone 416-598-2920

Fax 416-598-5394

Campbellford Memorial Hospital Energy Retrofit Project Savings Review

Campbellford Memorial Hospital implemented an Energy Retrofit Agreement with MCW in 2007. CMH is presently in its fifth Reconciliation Period of guaranteed monitoring. The site was tracked through its construction period to evaluate and report on its initial performance. This report assesses the monitored performance, validates the savings to date, reports on anomalies being seen and establishes a more formal reporting form to benefit the Hospital.

The savings being shown are using the baselines established in the Feasibility Study with variations provided for weather and billing period using the Metrix™ software program. Please refer to the detailed assessment provided with this update.



Performance to Date

Shown below is the monitored performance from the start of implementation in April 2007, throughout the two year construction build out period (P01 and P02) and through 3 years of post-commencement monitoring (P03 through P05). To date the Project is over performing by a cumulative amount of \$122,458 ending March 2012 (P05 Period).

Reconciliation Periods	Contractual Schedule of Energy Savings (\$)	Actual Performance Savings (\$)	Over or Under Performance (\$)
TOTALS for P01	\$52,040	\$58,033	\$5,993
TOTALS for P02	\$80,600	\$103,010	\$22,410
TOTALS for P03	\$80,600	\$84,555	\$3,955
TOTALS for P04	\$80,600	\$135,662	\$55,062
TOTALS for P05	\$80,600	\$115,638	\$35,038

Energy Measures Implemented

The following energy conservation measures were implemented

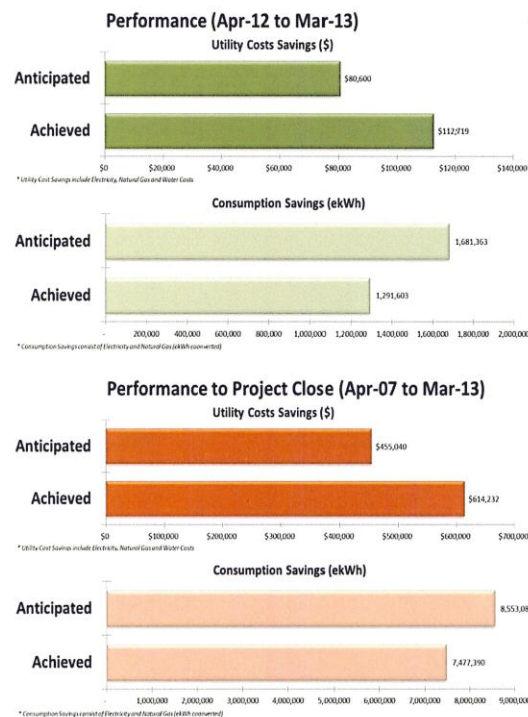
- Lighting Redesign/Retrofit
- Lighting occupancy sensors installation
- Hot water heating boilers controls retrofit & link 1969 and 1985 heating plants
- Installation of high efficiency steam generators as well as repair steam traps/condensate piping
- Modifications to domestic hot water heating & storage
- Implementation of heat recovery on new AH2
- DDC upgrade and expansion, replacement of pneumatic valve & damper actuators
- Building envelope improvements
- Installation of low flow domestic water fixtures

Savings Achieved

The graphs shown below provide a summary of the anticipated savings versus monitored savings. The final contractual reporting period spans April 2012 to March 2013. The actual cost savings are performing above the anticipated cost savings targets, but in the most recent two years we have seen a simultaneous increase in both electrical consumption and demand. We believe that the reduction in savings can most likely be attributed to added load as compared to a change in how equipment is operated.

Annual Savings Anticipated

The annual anticipated savings are \$80,600. This reporting period represents the sixth and final full monitored year of performance. Year to date cost savings have exceeded the anticipated target. This concludes the savings reporting for this project.



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Campbellford Memorial Hospital Energy Retrofit Project Savings Review

Campbellford Memorial Hospital implemented an Energy Retrofit Agreement with MCW in 2007. CMH has completed its sixth and final Reconciliation Period of guaranteed monitoring. The site was tracked through its construction period to evaluate and report on its initial performance. This report assesses the monitored performance, validates the savings to project close, reports on anomalies being seen and establishes a more formal reporting form to benefit the Hospital.

The savings being shown are using the baselines established in the Feasibility Study with variations provided for weather and billing period using the Metrix™ software program. Please refer to the detailed assessment provided with this update.

Performance to Project Close

Shown below is the monitored performance from the start of implementation in April 2007, throughout the two year construction build out period (P01 and P02) and through four years of post-commencement monitoring (P03 through P06). The Project has over-performed by a cumulative amount of \$159,192 ending March 2013 (P06 Period).

Reconciliation Periods	Savings Month	Contractual Schedule of Energy Savings (\$)	Actual Savings (\$)	Over or Under Performance (\$)
TOTALS for P01		\$52,040	\$56,896	\$4,856
TOTALS for P02		\$80,600	\$100,977	\$20,377
TOTALS for P03		\$80,600	\$83,889	\$3,289
TOTALS for P04		\$80,600	\$138,808	\$58,208
TOTALS for P05		\$80,600	\$120,943	\$40,343
TOTALS for P06		\$80,600	\$112,719	\$32,119
TOTALS for P01 - P06		\$455,040	\$614,232	\$159,192

March 8, 2010

The *Monday*Report

OUR VISION

To be a recognized leader in rural health care, creating a healthy community through service excellence, effective partnerships and the development of innovative small hospital services.

OUR MISSION

Campbellford Memorial Hospital is dedicated to relief of illness, pain and suffering, and to promotion of health, for the communities we serve.

OUR VALUES are CLEAR

Compassion, Learning & Innovation, Excellence, Accountability, Respect

TURN OFF THE LIGHTS

Turning off lights that aren't being used is a simple and effective way to save energy. It does not require any equipment and the energy savings can be significant.

Affordability

Turning off lights is free. Breaking old lighting habits is the challenge.

Here is how BC Hydro sees the cost savings from turning off lights

The moment a light is turned off, it stops using energy, so your savings add up by the minute. If every household in B.C. turned off a 100-watt incandescent light for four hours each day, each bulb could save 3.3 cents a day. It would also save the province 227 Giga-watt hours, which could power Whistler for 12 years.

Environmental Considerations

Since there is no equipment required, there are no environmental impacts from product manufacture, shipping or disposal. Get everyone in your household into the habit.

What you need to know

- Turn off lights whenever a room is unoccupied, even if it's only for a few minutes.
- Try putting reminders next to light switches until you get into the habit.

FAQ

Does it take more energy to turn a light back on than is saved by turning it off for a short period of time?

No. For most home lighting, there is no extra energy draw when a light is switched on. While fluorescent lamps do use a tiny bit more upon start-up, if the light is off for more than five seconds, you'll save energy.

Will turning lights on and off wear out the light bulbs faster?

While it is true that Compact Fluorescent Lamps (CFLs) can be sensitive to rapid on/off cycling in situations where only brief illumination is required, it is still better to turn lights off, even when it's only for a few minutes. The energy savings will easily offset any reduction in lamp life.

It all helps.

While the hospital has undertaken a number of larger projects to reduce energy use, we can't forget about the basic things we all can do to help both here and at home. Turning off lights (and other electrical items) when we are not using them saves money that we can use for other important things and it also reduces environmental impact.



Planning for future projects

In 2014 the hospital issued a RFP (Request for Proposal) to review our energy position and look at potential energy saving projects that might be practical. Again MCW was selected out of three bidders to complete the review of all buildings within the campus.

Out of that study MCW identified the following potential savings:

PROGRAM	UTILITY SAVINGS (\$)	TOTAL COST (\$)	INCENTIVES AVAILABLE* (\$)	SIMPLE PAYBACK (Yrs)
Energy Retrofit Program <i>All Buildings</i>	\$29,958	\$319,097	\$18,837	10
Energy Retrofit Program <i>Campbellford Memorial Hospital</i>	\$21,180	\$220,033	\$9,752	9.9
Energy Retrofit Program <i>Campbellford Memorial Self-care Lodge</i>	\$3,553	\$54,825	\$4,631	14.1
Energy Retrofit Program <i>Campbellford Memorial Health Centre</i>	\$5,225	\$44,238	\$4,454	7.6

* available at the time of the MCW report (March 2014)

Page 15 shows the details of the projects identified for the hospital building.

Projects Specific to the Hospital

PROGRAM	TOTAL SAVINGS (\$)	ELECTRICITY SAVED (KWH)	NATURAL GAS SAVED (M3)	WATER SAVED (M3)	MEASURE COST (\$)	SIMPLE PAYBACK (Yrs)
A01 - Lighting retrofits	\$5,436	40,311			\$61,913	11.4
A02 - Interior LED Lamps	\$389	2,212			\$6,422	16.5
A03 - Exterior LED lamps	\$1,130	11,689			\$12,000	10.6
B02 - Steam generator controls	\$646		2,415		\$19,002	29.4
B03 - Boiler pipe modifications	\$858		3,209		\$12,200	14.2
B05 - Variable speed drive installs	\$4,203	43,465			\$66,967	15.9
B07 - Steam trap replacement	\$1,222		4,573		\$4,054	3.3
B09 - Water cooled condenser replace	\$6,204	(6,155)		2,109	\$23,724	3.8
B10 - Pipe insulation	\$915		3,424		\$7,745	8.5
C03 - re-commission air handlers 7 & 8	\$177	1,560	96		\$6,006	34.0
ALL PROJECTS:	\$21,180	93,082	13,717	2,109	220,033	10.4 *

* Payback before incentives are applied.

This list is selected projects to consider over the next several years. In 2014 we have obtained funding to replace exterior lighting with LED type fixtures

Action Plan for 2014

Currently, we are going ahead with replacement of exterior lights with LED type fixtures (see page 17 for details)

We are also installing low E, argon filled windows in all patient rooms on the first floor Med/Surg. wing. These specialty windows neutralize the effects of changing weather on the inside of our building. They help keep a constant temperature longer so our air-conditioning and heating systems don't have to boot up quite so often. Additionally, they provide added protection against air leakage.

Through the "Run it Right" program operated by Enbridge Gas, we are working on implementing the recommendations they made to reduce consumption of gas by making low cost (non capital) process improvements and changes. For example, insulating condensate return lines for the steam boilers, and changing operational setting on some of the automatic controls managed by our building automation system.



Campbellford Hospital
LIGHTING UPGRADE - ENERGY SAVINGS
Campbellford, ON

RETROFIT LOCATION	EXISTING FIXTURE TYPE	LAMPS PER FIXT QTY	LIGHTING USAGE HRS/YR	WATTS PER FIXT	ENERGY SAVINGS LIGHTING UPGRADE	UNIT QTY	WATTS PER UNIT	TOTAL WATTS SAVED	TOTAL KWH SAVED	EST. ANNUAL ENERGY SAVINGS
POLE LIGHTS	250w MH 120v	11	4380	293	NEW: COOPER LIGHTING LED RIDGEVIEW FIXTURE	11	95	2178	9,540	\$ 1,049.36
WALLPACKS	250w MH 120V	5	4380	293	NEW: COOPER LIGHTING LED CROSSTOUR WALLPACK REFRACTIVE	5	50	1215	5,322	\$ 585.39
TOTAL FIXTURE QUANTITY		16				16	KV Saved:	3.4	14,861	\$1,634.75
TOTAL SUPPLY & INSTALL PROJECT PRICE QUOTATION										
Cost Avoidance is Based on Estimated Failure & Replacement Rate of Existing Lighting System. NOTE: HYDRO REBATES BASED ON CUSTOM WORKSHEET NEDCO IS NOT RESPONSIBLE FOR DISCREPANCIES UPON APPROVAL. Blended Hydro Rate Used = \$0.11 / KWh (Includes Demand & KWh Consumption). This information is supplied to The customer for its internal Management use only and should not be provided to any other outside sources without a written agreement from NEDCO Lighting										
ESTIMATED ELEGIBLE 2012 ERIIP REBATE - PRE-APPROVAL REQUIRED										
NET PROJECT COST - TOTAL SUPPLY & INSTALLATION COST										
ESTIMATED ANNUAL ENERGY SAVINGS										
ESTIMATED ANNUAL COST AVOIDANCE DURING PAYBACK PERIOD										
ESTIMATED ANNUAL SAVINGS DURING PAYBACK PERIOD										
PAYBACK PERIOD IN MONTHS WITHOUT UTILITY INCENTIVE										
PAYBACK PERIOD IN MONTHS INCLUDING UTILITY INCENTIVE										
ESTIMATED MONTHLY SAVING - ENERGY COSTS & COST AVOIDANCE										
Revised: 8/28/2014 \$477.00 (\$477.00) \$1,634.75 \$0.00 \$1,634.75 0.0 -3.5 \$136.23										