

# A Five-Year Energy Demand Conservation Plan For Cornwall Community Hospital 2014 to 2018



Cornwall Community Hospital  
Hôpital communautaire de Cornwall

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## Introduction

A strategic energy plan is not a static document but rather a long-term blueprint to focus and guide efforts and actions toward a defined energy vision. Such a plan articulates goals, develops strategies and actions to meet the goals, and identifies and allocates resources to assure effective completion of these strategies. Instead of undertaking decisions on a single-year, as-needed basis, a strategic plan can be:

- **Proactive** -outlines deliberate actions based on clearly articulated priorities;
- **Comprehensive** -encompasses a broad scope, based on organization priorities, that identifies and pursues high payoff opportunities through coordinated planning and sustained effort;
- **Structured** -provides defined and thoughtfully organized guidance through a specific plan for action;
- **Long-term** -allows decisions that require multi-year investments or planning; can stage a series of projects to undertake as funds become available; and
- **Enduring** -establishes a path forward that will maintain relevancy beyond a current administration. <sup>1</sup>

## The Ontario Green Energy Act – Regulation 397/11

Regulation 397/11 of the Ontario Green Energy Act came into force January 1, 2012. It requires public agencies to report their annual energy use and GHG emissions to the Ministry of Energy by July 1, 2013. In addition, public agencies will need to develop five-year energy conservation and demand management (CDM) plans by July 1, 2014.

Public agencies must make their annual energy reports and five-year energy CDM plans publicly available on their websites and in hard copy. The regulation includes hospital facilities in its definition of public agencies. As a result, Cornwall Community Hospital (CCH) must meet the requirements of the regulation within the stated timelines.

## Background

Cornwall Community Hospital engaged Cowan Environmental Consulting to assist in the development of a strategic energy conservation plan for the hospital. Research on best practices in energy management for hospitals was undertaken. On October 3, 2013 Cowan Environmental Consulting and KDC Limited conducted a level one walkthrough energy audit of the McConnell Street campus to identify potential low cost or no cost opportunities to conserve energy (Appendix 1). A former energy audit conducted in 2011 was also reviewed and reconciled with the results of the October 3, 2013 Level 1 energy audit (Appendix 2). A workshop was delivered on November 12, 2013 to operations staff to present the findings of best practice research, audit results. Staff discussed and developed a vision, key objectives, critical factors for success, current opportunities to reduce energy consumption and prioritized these opportunities for implementation.

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<sup>1</sup> (Adopted from US DOE, *Guide to Community Energy Planning*, March 2013).

## Current State of Energy Planning and Energy Efficiency Initiatives

Currently, no long-term strategic energy conservation plan for the hospital exists. However, the Hospital does collect and track energy related data for its facilities by volume and by cost using an MS excel based spreadsheet format. It has also had energy audits done on its facilities in the past. In addition, the hospital is going through a major 6 year capital redevelopment project to be completed in the last quarter of 2014. During these activities energy efficiency measures were considered. The hospital has installed and used some building automation systems that can assist in managing energy. Energy consumption is considered during regular operating and maintenance upgrades. Education and staff engagement activities have been undertaken previously as well. Finally, a Green Team comprised of staff has been created and has the potential to assist in energy conservation related programming and projects.

Moving forward, the idea of producing a strategic energy conservation plan that provides all stakeholders at the hospital a clear roadmap to conservation opportunities that can reduce operating costs, manage risks associated with the increasing price of energy, and improve patient and staff comfort has been an important consideration by operations staff and others at the Hospital. There is a strong desire and commitment among operations staff to establish a long-term focus and strategic plan on energy conservation.

## Baseline Utility Data

Cornwall Community Hospital has seen a marked increase in utility costs since the new addition has come online. As the West Wing addition has been under construction and the Tower has been undergoing a building envelope upgrade, a full year of utility data was not available to establish a proper baseline for the McConnell Campus. As such a full baseline analysis should be completed after all Phase 3 activities associated with the new addition and current renovations are completed and have been operating for one full year. However, when comparing 2013 to 2012, utility consumption has increased significantly as a result of the 95,000 square foot addition: electricity has increased 24%, natural gas has increased by 66%, and district hot water increased by 54%. The following table provides a comparison of 2012 and 2013 monthly utility data.

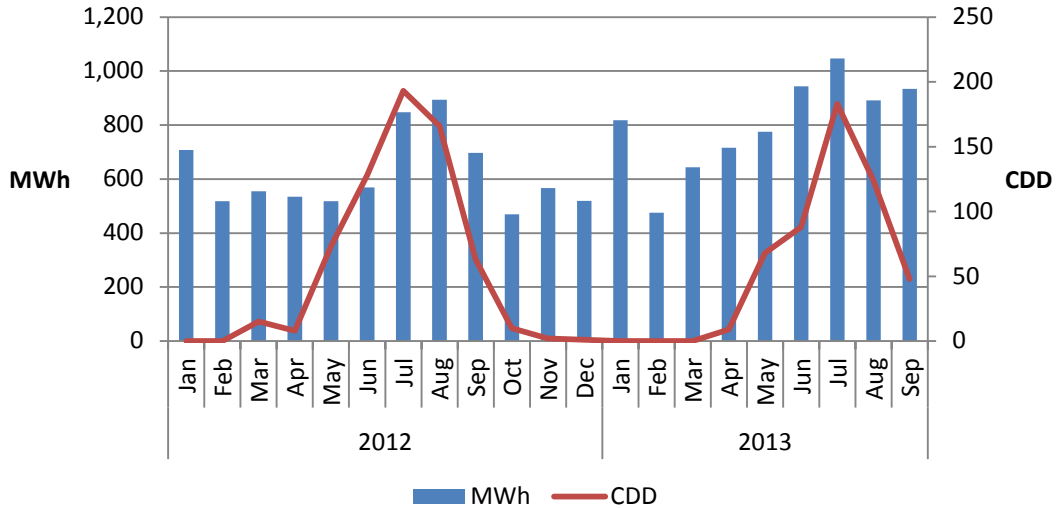
**Table 1: Comparison of utility data (MWh) for 2012 and 2013**

Month	Electricity			Natural Gas			HTHW		
	2012	2013	Variance	2012	2013	Variance	2012	2013	Variance
Jan	708.0	817.5	15.5%	494	855	73.2%	1,387	1,391	0.3%
Feb	517.5	475.5	-8.1%	526	917	74.6%	206.6	865.6	319.0%
Mar	555.0	643.5	15.9%	446	765	71.5%	489.5	760.0	55.3%
Apr	534.0	715.5	34.0%	367	856	133.3%	384.2	746.0	94.2%
May	517.5	775.5	49.9%	293	429	46.2%	226.6	421.5	86.0%
Jun	568.5	943.5	66.0%	227	291	28.4%	165.8	423.0	155.1%
Jul	847.5	1,047	23.5%	239	343	43.6%	351.3	478.0	36.1%
Aug	894.0	891.0	-0.3%	240	306	27.5%	459.5	433.3	-5.7%
Sep	697.5	934.5	34.0%	217	306	41.1%	235.6	486.9	106.7%
Total	5,840	7,244	24.0%	3,048	5,069	66.3%	3,906	6,006	53.8%



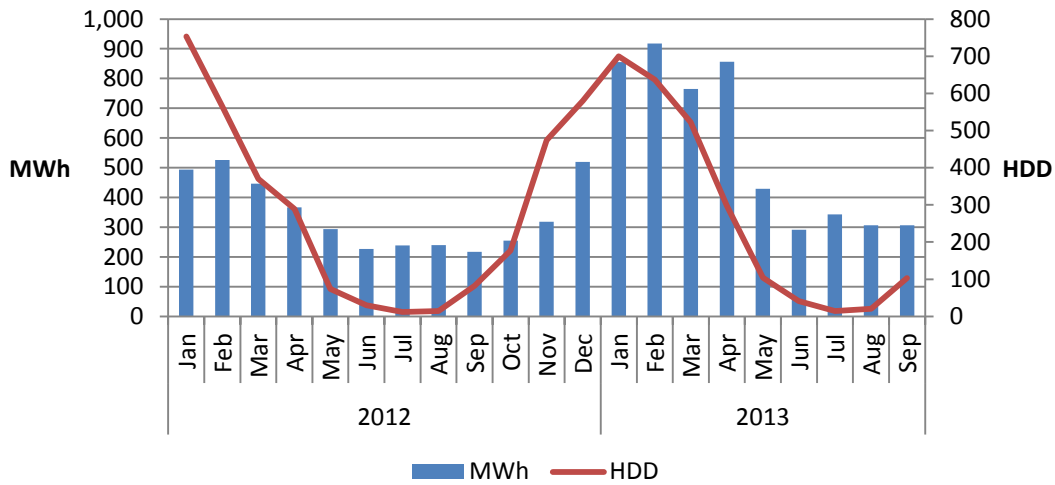
The following graph displays the monthly electricity consumption and plots the number cooling degree days (CDD) during the period for comparison.

**Figure 1: Monthly electricity data (MWh) and CDD for 2012 and 2013**



As can be seen in the figure above, electricity usage increases during the summer months as would be expected and seems to correlate well with cooling degree days. It was also noted that there is an unexplained spike in electricity consumption in January each year which dates back to 2011 (the earliest data that was analyzed for this report). As previously indicated, electricity has increased significantly in 2013 as a result of the new addition; a proper baseline should be established when a full year of electricity data is available. Although it will be difficult to notice because of the new addition, electricity costs associated with cooling the Tower, and 5 new Air handling units online in the spring of 2014, should be lower due to the building envelope upgrade. The following graph displays the monthly natural gas consumption and plots the number heating degree days (HDD) during the period for comparison.

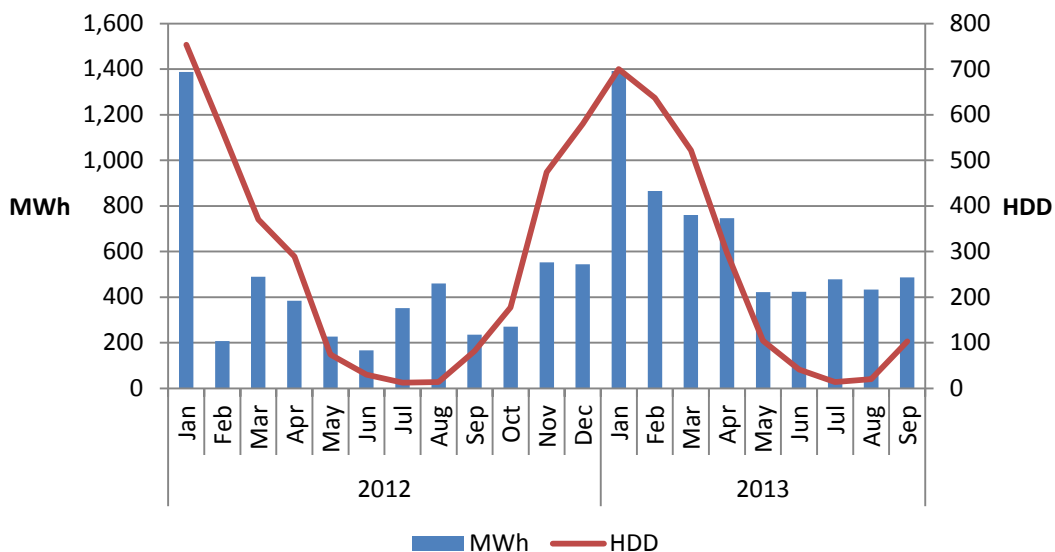
**Figure 2: Monthly natural gas data (MWh) and HDD for 2012 and 2013**



As can be seen in the previous figure, natural gas consumption increases during the winter months and correlates well with heating degree days. Consumption in the summer months is base load associated with sterilization, humidification, and distribution losses. As previously indicated, natural gas has increased significantly in 2013 as a result of the new addition; a proper baseline should be established when a full year of natural gas data is available. In the Marbek report, it was determined that approximately 55% of natural gas consumption was due to distribution losses in the steam system. See recommendations further in the report to address this issue.

The following graph displays the monthly High Temperature Hot Water (HTHW) consumption and plots the number heating degree days (HDD) during the period for comparison.

**Figure 3: Monthly HTHW data (MWh) and HDD for 2012 and 2013**



As with natural gas consumption, HTHW usage increases during the winter months and correlates well with heating degree days. Consumption in the summer months is base load associated with domestic hot water production. As previously indicated, HTHW consumption has increased significantly in 2013 as a result of the new addition; a proper baseline should be established when a full year of HTHW data is available. Although it will be difficult to notice because of the new addition, HTHW costs associated with heating the Tower should be significantly lower due to the building envelope upgrade.

Although, staff have been able to anticipate price increases in energy and have implemented various bulk purchasing strategies, including a new 5 year fixed price agreement signed in 2014, to minimize risk associated with these increases CCH can continue to expect challenges with respect to energy consumption costs. The new addition represents over 100,000 square feet of new space. Even though energy efficiency was a consideration in the design and construction of the new addition, energy prices in Ontario have and will continue to increase. Given these trends, it is timely and apropos to be developing a longer-term energy conservation strategy that can lower risk associate with rising prices and identify and address operational efficiencies on a continual basis.

#### **Utility Costs Benchmarking in Ontario Hospitals and How CCH Compares?**

As part of provincial reporting requirements all Ontario hospitals report on a number of performance measures including their utility costs. These costs are benchmarked against other hospitals of similar size and operational capacity. In 2012/2013 CCH saw a 4.2% increase in utility costs compared to 2011/2012. The annual costs were \$52.69/m<sup>2</sup>. The mean costs for similar hospitals was \$40.23/Square Metre. The top 25% performers average a cost of \$41.52/ m<sup>2</sup>. The lowest 25% of performers averaged a cost of \$61.73/ m<sup>2</sup>. These results indicate that CCH sits in the middle of the pack with respect to utility costs. As such, there are potential opportunities for CCH to improve its performance with respect to utility costs and energy consumption.

#### **Participation in the OHA's Green Hospital Scorecard**

In 2013, CCH participated in the Ontario Hospital Associations' environmental benchmarking initiative. The Green Hospital Scorecard is a new benchmarking and recognition program which aims to reflect hospitals' environmental performance as indicated by their operations, management, and policies. The scorecard program allows participating hospitals to submit their environmental data online. This data will form the basis of the benchmarking and recognition components of the program. As a vehicle for hospitals to assess their environmental performance relative to peers, the program:

- Allows hospitals to benchmark their own year-over-year performance
- Allows comparative benchmarking against peer hospital performance

- Encourages improvement and leadership through a recognition program

Participation in this program enables hospitals to be eligible for the Green Health Care Awards in the categories of Energy Efficiency, Waste Management, Water Conservation and Protection, and the newest category, Green Hospital of the Year. Hospitals will also be eligible to receive Green Hospital Scorecard seals for publishing on their website and/or any related communication materials. These will be awarded on an annual basis.

### Plan Framework and Approach

There are many possible approaches and frameworks available to guide strategy energy conservation planning. It is important to emphasize that an energy conservation plan is more than an energy audit report outlining equipment and technology improvements. The plan should also include policies, procedures, and behavioural measures for implementation in addition to mechanical and technical ones. These measures should not be considered separately but in consideration of each other and the energy saving potential of combining the timing and implementation of these measures to achieve optimal results. The plan needs to be a long-term roadmap for achieving real savings in energy use and financial resources.

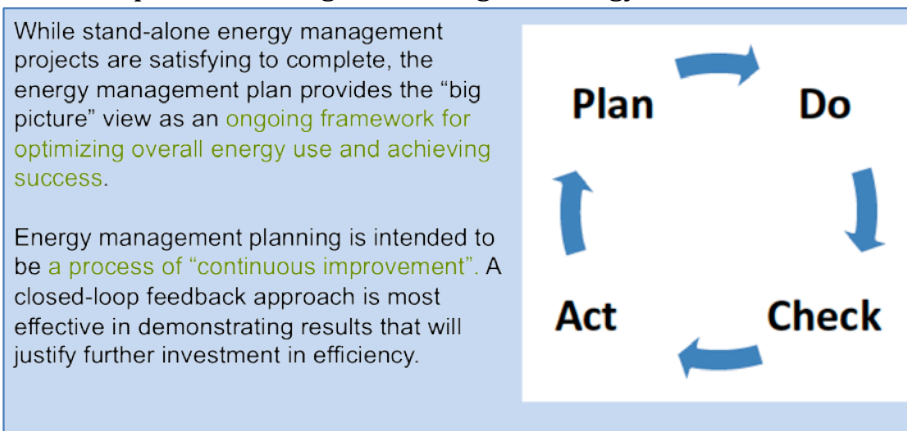


Figure 4: Ontario Power Authority - Energy Management Plan Template, December 2012

The plan provides a clear reference point for staff and patients on CCH commitment to energy conservation, sets targets and describes the possible benefits as well as how measures to reduce energy will be undertaken and how success will be determined. It sets out roles and responsibilities of staff, suppliers and other stakeholders, and also includes mention of education and training goals. Essentially the plan gives provides for a clear understanding of the organizations commitment to conserving energy.



Based on discussions with staff, review of various best practices in energy conservation planning, and the Ontario government’s newly released “Guide to Preparing Conservation and Demand Management Plans”<sup>2</sup>, the diagram in Figure 5 outlines the process to be followed in developing Cornwall Community Hospital’s Energy Plan.

### Energy Planning Process

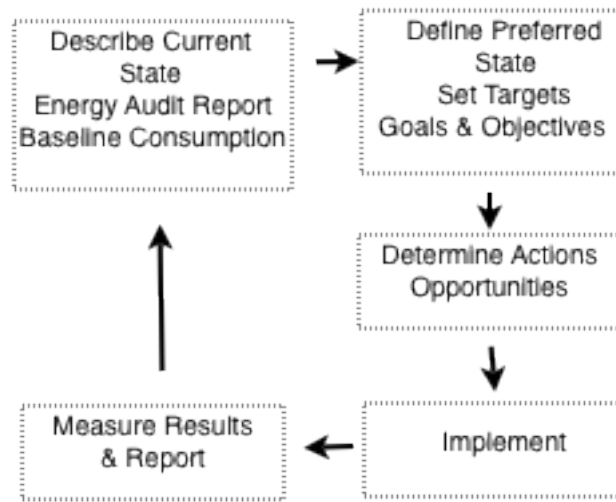


Figure 5: - CCH Energy Planning Process

### Energy Planning Principles

In addition to applying the process outlined in Figure 5, there are a number of important guiding principles that CCH would like to apply as it further implements the plan and needs to make decisions regarding how it will act.

#### A whole building, integrated systems approach:

All too often, the past trends in energy conservation have been project based. There are many reasons why such an approach has been taken. However, it is a well-known fact that one by one energy conservation projects that do not consider interaction or implications on other energy related systems and opportunities is inefficient and marginally effective. Significantly greater results can be achieved through a comprehensive, integrated whole building approach that considers the connection between conservation opportunities.

#### Stakeholder engagement:

A critical factor to any long-term success to conserve energy requires that the facilities stakeholders including staff, and patients be included in the development and active implementation, measuring and reporting process. Without broad involvement and input it will be challenging to create a culture of energy efficiency. Leadership from the top will be important to supporting the roll out of the plan in this regard.

#### Sustainability:

The principle of sustainability considers organizations actions over the long-term, setting the stage for continued success. It also looks beyond energy to consider

<sup>2</sup> Ontario Ministry of Energy, Nov. 12, 2013

other resources such as water and materials all of which have potential costs and savings through efficiency and proper management. An important consideration for Cornwall Community Hospital is how an energy conservation focus can contribute to sustainability of the organization and what other opportunities could be linked. Sustainability goes beyond typical fiscal or economic consideration to consider other fiscal, environmental, and social costs and savings. Essentially expanding the scope of financial analyses to include co-benefits and the opportunity costs of managing risk more effectively.

#### Timing on Implementation of the Plan – completion of Phase 3 tasks of new addition

Although the new addition is open and operating there are still a number of tasks to be completed with respect to the various systems in the building. A critical success factor for the implementation of this plan and its priority actions is the completion of all activities identified in Phase 3 of expansion and renovations of the Hospital. New systems, procedures and machinery will need to be operating as expected in order for many of the additional priorities identified in the plan.

## A Five-Year Plan for Cornwall Community Hospital

### An Energy Efficiency Vision for Cornwall Community Hospital

***In 2018, Cornwall Community Hospital will have an energy wise culture and will be viewed by others as a leader in energy efficiency initiatives. It will have reached its goal to be recognized within the top 25<sup>th</sup> percentile of energy efficient hospitals in Ontario through innovation and continuous improvement initiatives. In addition, the carbon footprint and greenhouse gas emissions from the hospital will be reduced providing overall financial savings and improved patient comfort. The CCH Board of Directors, staff, patients, suppliers and community stakeholders will be committed to playing an active role in these initiatives and the hospital will strive to share its knowledge and experience gained with others.***

### Reduction in Energy Consumption Target and GHG Emission

Based on a review of current energy conservation targets for hospitals, and current accepted industry knowledge Cornwall Community Hospital will seek to meet a target of 25% reduction in energy consumption from the baseline energy consumption for the McConnell Street campus in 2013. A corresponding reduction in Green House Gas Emissions will also be achieved. This may be different than 25% due to the energy mix supply for the hospital. For example Cornwall Community Hospital's electricity is from Hydro Quebec.

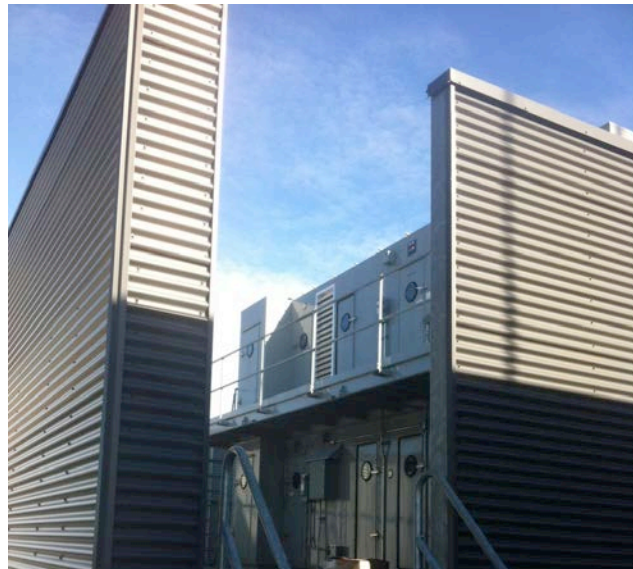
## Objectives, Actions and Priorities

The plan is intended to be a strategic, big picture roadmap for the next 5 years. It will guide Cornwall Community Hospital so that it can manage complex and dynamic energy consumption issues and opportunities. The following objectives were developed in order to assist in organizing various actions and opportunities that could contribute to meeting the plan's vision and target in an effective and efficient manner. Each objective is described below and is listed in the Actions and Priorities Table with corresponding actions associated with the specific objective:

1. Establish Staff Commitment;
2. Initiate Low Cost No Cost Actions;
3. Determine New Capital Requirements;
4. Determine Finance and Budget Requirements and Opportunities;
5. Manage Accountability and Responsibility;
6. Develop EE Policy and Document Operating Procedures, and Standards;
7. Establish Necessary Partnerships; and
8. Measure and Report on Results

Actions were identified through past energy audits and during the November 12, 2013 workshop with Support Services staff. An initial prioritization exercise was also undertaken during the workshop. Priorities were determined based on the following criteria:

(1) Potential for Energy Savings; (2) Estimated Costs; (3) The Degree of Urgency to implement; and (4) The Degree of Difficulty to Implement the Proposed Measure. The following table describes the specific measures identified for Cornwall Community Hospital to undertake over the next five years. The format is based on the Ontario Government's recently released "*Guide to Preparing Conservation and Demand Management Plans*" (Nov, 2013)<sup>3</sup>. The table describes the specific measure, present state related to each measure, and the preferred state related to each measure. In addition to these categories, the table also includes a priority rating, proposed timing of implementation and identification of the department responsible for implementation. Detailed cost estimates are not included in the plan at this time.



<sup>3</sup> A Guide to Preparing Conservation and demand Management Plans, (November 12, 2013), Ontario Ministry of Energy.

Detailed cost estimates will require various in depth energy audits that have not yet been undertaken and a variety of technical feasibility studies. As such these measures are included in the table and are part of the overall planning activities.

Finally, it is important to note that although various measures have been listed and prioritized, the plan should be viewed as a living document that allows for flexibility and innovation with respect to implementation. There are many external factors that might influence when and how various measures are implemented.

Nevertheless, the plan provides staff and other stakeholders with a path forward. Ultimately, establishing proper measures of success and reporting and reviewing these measures regularly will provide CCH with the necessary information required to adapt, continually improve and meet its 5 year target of a 25% reduction in energy consumption.

## Actions and Priorities

OBJECTIVE AND PROPOSED MEASURES	PRIORITY <sup>4</sup>	PRESENT STATE	PROPOSED STATE	TIMING (YEAR)	IMPLEMENTING DEPARTMENT
<b>OBJECTIVE 1 - ESTABLISH STAFF COMMITMENT</b>					
Develop a Staff Engagement and Behavioural Change Plan	High	Staff are not aware of opportunities to conserve energy	Develop a plan and offer incentives and information to staff so they can reduce energy.	2014	Support Services
Develop an Energy Champion's Charter	Low	Staff is not formally committed to reducing energy.	Develop a written charter that allows staff to commit to reducing energy.	2015	Support Services
Develop and Deliver a Staff Education/Training Program	Med	Opportunities to learn how to conserve energy are currently not available	Develop a program to informally educate staff on the energy conservation methods and standards available.	2015	Support Services
Energy Conservation Workshop for Staff	Med	Staff are not informed on what the hospital is hoping to achieve	Develop a workshop(S) where staff can be informed on energy conservation	2015	Support Services
Communicate Energy Reducing Successes	High	There are currently no consistent communications regarding energy conservation for staff.	Communicate regularly and effectively to staff and stakeholders on energy conservation successes..	2015	Support Services

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<sup>4</sup> Staff input April, 2014



OBJECTIVE AND PROPOSED MEASURES	PRIORITY <sup>4</sup>	PRESENT STATE	PROPOSED STATE	TIMING (YEAR)	IMPLEMENTING DEPARTMENT
Recognize Staff Participation	High	There are no incentives for staff to participate in energy conservation.	Recognized the efforts of staff to reduce energy use.	2015	VP Support Services
Present Plan to Staff	Low	Staff is currently unaware of the Hospital's requirement to develop a plan.	Inform staff through a presentation about the energy conservation plan and its importance	2014	Support Services
Consider Awareness Cards that Recognize Participation of Staff (Cudo's Cards)	High	A suggestion to increase awareness using cards that can be left at staff desks has been proposed.	Develop the cards and distribute to staff as opportunities arise.	2015	Support Services
Create Energy Conservation News Letter	Low	Limited written communications on website currently exists.	Establish a quarterly newsletter that informs staff on energy conservation p[progress and future opportunities to participate.	2014	Support Services
Regular emails to staff on status of Energy Conservation Initiatives	Med	No specific or strategic written communications to staff currently exist	Use emails as a regular mode of communicating important initiatives or information about the plan.	2015	Support Services
Involve and Inform the Board Regularly on Status of the Plan, on savings, return on investment etc.	Med	Reporting on energy is on an as needed basis	Establish a consistent and regular reporting process to the Board on energy consumption	2014	VP Support Services

OBJECTIVE AND PROPOSED MEASURES	PRIORITY <sup>4</sup>	PRESENT STATE	PROPOSED STATE	TIMING (YEAR)	IMPLEMENTING DEPARTMENT
			and conservation results.		
<b>OBJECTIVE 2 – INITIATE LOW COST/NO COST ACTIONS</b>					
Chiller Systems Optimization	High	It has been observed that the new Chiller system is not operating at peak capacity.	Ensure that opportunities are employed to operate the Chiller system at optimum operating standards.	2014	Support Services
Insulate Exposed Piping	High	There are numerous places where piping is exposed.	All piping is insulated to reduce negative heat loss/gain. Use current log book to identify where piping needs to be insulated.	2014/2015	Support Services
Perimeter Re-Heating - pumps	Med	Perimeter re-heating pumps are not operating at optimum.	Assess system in conjunction with dehumidification and cooling systems to determine optimum operating option.	2015	Support Services
Occupancy Sensors	Low	There are opportunities to use occupancy sensors in many locations to reduce energy use.	Maximize opportunities where occupancy sensors can contribute to energy reductions.	2016	Support Services
Energy (heat) Wheel Controls	High	It has been observed that there heat wheels that in AHU's that are	Provide optimum corrective actions.	2015	Support Services

OBJECTIVE AND PROPOSED MEASURES	PRIORITY <sup>4</sup>	PRESENT STATE	PROPOSED STATE	TIMING (YEAR)	IMPLEMENTING DEPARTMENT
		not functioning properly.			
Marbek Audit Operating and Maintenance Recommendations (Appendix 1 and 2)	Low	A number of recommendations were made that have not yet been implemented.	Implement proposed measures where appropriate.	2014	Support Services
Daylight Harvesting	Low	Daylight harvesting opportunities are not maximized.	Where possible and in future renovations consider daylight harvesting opportunities	2015	Support Services
Personal Heaters in Office Space	Med	Numerous staff are using personal space heaters in their office space	Remove personal space heaters and maintain comfortable work environment for staff .	2015	Support Services
Exchange with Other Operations Staff for BP's	Med	There is currently no formal sharing or BP's among similar sized hospitals in the region.	Establish a program that allows for staff to share innovative solutions and BP's in the region regularly.	2015	Support Services
Replace Lighting as switched out with more efficient options	High	Although some replacement of inefficient light has been undertaken there are currently more opportunities.	All inefficient light is replaced.	2014	Support Services
Establish and Deliver Proper preventative Maintenance Program	High	Although in development, currently there does not exist a	Complete and implement a PMP.	2014	VP Support Services

OBJECTIVE AND PROPOSED MEASURES	PRIORITY <sup>4</sup>	PRESENT STATE	PROPOSED STATE	TIMING (YEAR)	IMPLEMENTING DEPARTMENT
		Preventative Maintenance program.			
<b>OBJECTIVE 3 – DETERMINE NEW CAPITAL REQUIREMENTS</b>					
Undertake A Lighting Retrofit Project	Low			2016	Support Services
Undertake a Detailed Energy Audit including technical feasibility on Priority Action Items	High	Several inefficiencies have been observed during walk through audits, these audits do not include detailed financial estimates.	Identify and produce more detailed audit opportunities that includes specific fiscal costs and savings benefits.	2014	Support Services
Annex - Replace DHW Heater	High	The current hot water heater is ageing and is considered inefficient.	Consider during lifecycle replacement selecting a condensing hot water heater.	2014	Support Services
Consolidate Building Automation Systems	High	The existing BAS is composed of 3 separate systems that do not communicate.	Consolidate BAS systems into a single system and review control sequences of all equipment. See below under reporting for energy reporting requirement.	2015	Support Services
HDH AHU Cooling Coil	High			2015	Support Services
Heating Setbacks	High			2015	Support Services
Cooling Towers Chemical Treatment Loop	High			2014	Support Services

Replace Hot Water Tank for Kitchen Dishwasher	Med	The current Hot water tank for the kitchen is oversized for current use and ageing	Review requirements for use and replace during life-cycle replacement.	2016	Support Services
Chiller By-pass valve instead of VFD's	High	The variable Frequency drives are currently being by-passed.	Optimize variable flow operation.	2015	Support Services
New Building Dehumidification Sequence Reset	High	No sequence of operations currently exists for dehumidification.	Optimize dehumidification system for all possible areas of the hospital.	2014	Support Services
Tech Feasibility Study for Chillers and AHU's	High	There is a mix of systems and units meeting cooling and air handling needs including portable air conditioners on 2,3, and 6	Investigate optimum Air handling and cooling options and implement.	2014	Support Services
Tech Feasibility Study for Existing Boilers and Pumps	Med	Current boiler system is over sized and could be utilized more efficiently.	Assess current needs and revise system to match current needs.	2014	Support Services
<b>OBJECTIVE 4 - DETERMINE FINANCE AND BUDGET REQUIREMENTS &amp; OPPORTUNITIES</b>					
Power Factor Incentives	Low			2015	Support Services
Invest in a Self Financing Energy Renewal Fund	Low	Currently energy efficiency initiatives must come from general operating and maintenance budgets.	Investigate establishing an energy efficiency-operating fund that can be renewed through future savings achieved. Various options exist.	2015	VP Support Services



Assess and utilize utility funding Incentives and other funding when appropriate	Low	There are currently challenges accessing incentives for energy efficiency initiatives from utilities.	Ensure access to use of all potential energy conservation incentives are employed.	2014	VP Support Services
<b>OBJECTIVE 5 – MANAGE ACCOUNTABILITY AND RESPONSIBILITY</b>					
Establish an Energy Efficiency Technical Committee	High	There is currently no coordinating group within the hospital that can focus on identification, communication, measurement and reporting of energy use and conservation.	Establish a formal energy efficiency technical committee that will drive implementation of this plan and future projects listed including measurement and reporting to senior management and the established Green Team.	2013	Support Services
Establish dedicated resources to Coordinate Energy Plan Initiatives	High	There is a gap in the ability of current staff workload for a driver of energy efficiency initiatives.	Consider engaging a part-time energy manager and sharing the manager with other hospitals in the region to coordinate and manage energy efficiency policies, programs and projects.	2014	VP Support Services
Establish a Tracking System for Staff Issues Related to Comfort	High	Operators on staff receive complaints from hospital staff from time to time about office environmental conditions but these	Establish a system to track information regarding environmental comfort issues identified by hospital staff and use this information to	2014	VP Support Services

		are not currently tracked or assessed.	determine future solutions and priorities.		
<b>OBJECTIVE 6 – DEVELOP AND DOCUMENT ENERGY EFFICIENCY POLICES, PROCEDURES AND STANDARDS</b>					
New Construction Energy Standards (LEED or LEED Shadow)	Low	New construction standards exists to maximize energy and green building solutions. Currently the Hospital does not have a formal policy on the use of such standards.	Adopt and use LEED or LEED shadow standards for new construction in the future.	2017	VP Support Services
Adopt a Green Purchasing Policy that includes Energy Efficiency	Med	There is currently no formal policy that requires energy efficiency to considered in purchasing decisions	Energy efficiency purchasing policy will be a key consideration of future procurement of goods and services at the Hospital.	2015	VP Support Services
Include Bulk Purchasing as an option (Gas)	High	The Hospital has used and is currently in a bulk purchase agreement for natural gas.	Consider the use of a bulk purchase agreement again as an option to lower costs.	2014	VP Support Services
Establish retrofit Standards for Energy Efficiency	Low	There are a number of well-tested and utilized retrofit standards that can be followed. The Hospital currently does not have a formal policy adopting the use of such standards.	Adopt and use LEED or LEED shadow standards on future retrofits.	2016	VP Support Services

<b>OBJECTIVE 7 - ESTABLISH NECESSARY PARTERSHIPS TO SUPPORT ENERGY EFFICIENCY INITIATIVES</b>					
Research Opportunities and Develop a Partnership Strategy Cornwall Electric, Union Gas, Other suppliers of equipment and expertise, City of Cornwall , Other Hospitals in the Region		Currently there are opportunities to establish strategic partnerships in order to assist in implementation of the energy conservation plan.	Develop and implement a partnership plan that identifies opportunities to assist in implementing energy efficiency opportunities.	2015	Public Affairs, Support Services
<b>OBJECTIVE 8 - MEASURE AND REPORT ON RESULTS</b>					
Undertake a new baseline analysis after one full year of operation from the date of completion of all Phase 3 activities associated with the new addition and current renovations.	High	The McConnell campus is currently undergoing major renovations and a recent major new addition. As such, timing in order to establish an accurate baseline of energy use is not possible.	A complete and accurate baseline of energy use is undertaken that illustrates energy consumption for the McConnell campus.	2015	VP Support Services
Use Building Automation System to Produce Reports on Energy Consumption	High	The existing BAS is composed of 3 separate systems that do not communicate.	Any future considerations should include an operational Energy Information System.	2015	VP Support Services
Define and establish key performance Indicators (KPI's)	Med	Currently there are no formal KPI's for measuring success.	KPI's are established and used to determine overall success of energy conservation initiatives.	2014	VP Support Services
Install Sub-meters	Med	Currently few sub-meters exist to track energy use by building zone or	Establish necessary sub-meters to allow detailed tracking of energy use by zone and	2016	VP Support Services

		mechanical system.	or mechanical systems.		
Track and report on Energy use by Departments	High	Currently energy is paid out of a central budget and is not tracked by specific function or department. This may cause a specific disincentive for many staff to participate in energy conservation.	Establish a method of tracking and reporting on energy use by department in order to illustrate opportunities to conserve and engage staff.	2014	VP Support Services

## Priority Measures for Implementation and Preliminary Budget Estimates

As previously mentioned Cornwall Community Hospital has undergone a 6 year capital renewal project that will be completed in the last quarter of 2014. The redevelopment project has resulted in numerous changes to the hospitals energy consumption baselines. A key priority in moving this plan and the measures identified forward will be a complete baseline of energy consumption of the McConnell St. Campus once the redevelopment project is complete. This will allow for more accurate costs and payback estimates to be established and a detailed budget proposed. Nevertheless, there are some priority measures that staff agreed could begin before the end of the capital redevelopment project. These are:

1. A detailed technical analysis of the new Chiller and air-handling units (AHU's) along with recommended measures for improvement and estimated costs and payback. It is believed that the Chiller and AHU's will have a significant impact on the overall energy consumption that an analysis could proceed as soon as possible. Total estimated cost \$15,000.00
2. Preparation of a measurement and reporting system including reintegration of existing Building Automation Systems, research, identification and acquisition of energy conservation funding incentives from suppliers and government funding where possible to assist with future implementation of priority measures. Coordination and administration of the implementation of the plan and support for the Energy Efficiency Technical Committee. Undertake any no cost or low cost measures including education and awareness measures to increase staff awareness and support. Total estimated cost \$13,000.

Once the redevelopment project is complete the following measures will need to be undertaken:

1. Detailed Building Modelling and Energy Audit and reconciliation of existing energy conservation measures identified in the plan. Establishment of a long-term budget that includes costs, savings and payback period that is based on the audit and modelling and uses a buildings systems approach to optimize potential energy conservation measures. It is expected that these tasks will be undertaken in the first 2 quarters of 2015. Anticipated costs for these measures will be in the range of \$50,000.00. Efforts will be made to find funding through various agencies to contribute to the costs of these measures.





## Appendix 1 – 2013 Walkthrough Energy Audit

## **Appendix 2 – Marbeck 2011 Energy Audit**