



Conservation & Demand Management Plan

Nipigon District Memorial Hospital
www.ndmh.ca
397-11: Phase 2
2014-07-04

1 Executive Summary

The following Energy Conservation and Demand Management Plan is written in accordance with sections 6 and 7 of the Green Energy Act, 2009, O. Reg. 397/11. Energy management initiatives can produce environmental, economic and social benefits, including reducing greenhouse gas (GHG) emissions, cost avoidance and increasing savings. As concerns surrounding energy availability and cost 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 reduced price volatility. Our energy efficient capital and operating process improvements are key components to our success and will be outlined in our report. Nipigon District Memorial Hospital community is committed to the path of sustainability, in *all* aspects of our health care facility.

Our Goals & Objections

Our mission is to improve the health of the communities we serve. We recognize the critical relationship between environmental health and public health, and 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 facility operations. Our goal is to continuously monitor our current practices, so that maximal operating efficiency can be reached and resources can be allocated more appropriately to serve our community.



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3 Ontario's Green Energy Act – Overview

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

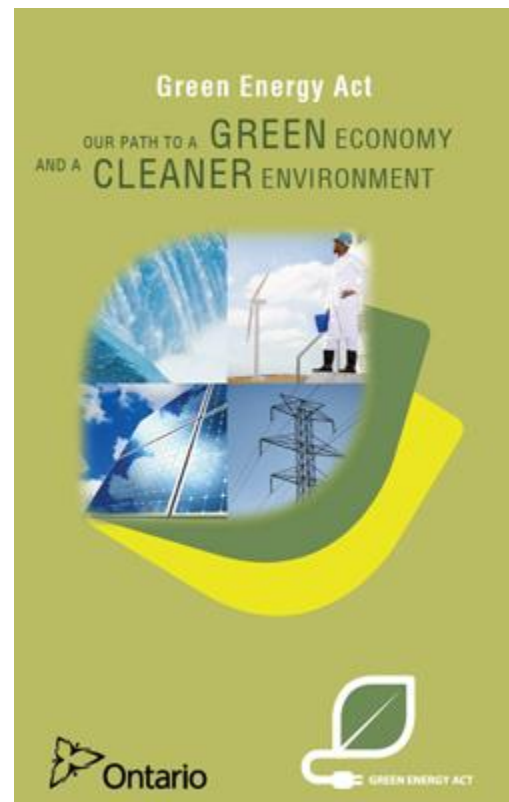
3.1 Promoting Energy Conservation

Conserving energy not only saves money for families and businesses, it also lowers demand on the electricity system and helps reduce greenhouse gas emissions.

Through conservation, Ontario homeowners, businesses and industry have saved more than 1,900 megawatts of peak demand electricity since 2005 – the equivalent of more than 600,000 homes being taken off the grid.

The GEA continues to promote 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*



4 Introduction

The purpose of Nipigon District Memorial Hospital's energy management plan is to promote sustainable stewardship of our environment and community resources. In keeping with our core values of **system efficiency** and **financial responsibility**, Nipigon District Memorial Hospital's energy management program will aim to reduce operating costs while enabling us to provide excellent and compassionate service to a greater number of persons in the community. The plan will also meet the requirements outlined in sections 6 and 7 of the Green Energy Act, 2009, O. Reg. 397/11.

To obtain full value from energy management activities, and to strengthen our conservation initiatives, a strategic approach will be taken. Our organization will strive to fully integrate energy management into our practices by considering indoor environmental quality, operational efficiency, and sustainably sourced resources into major financial decision-making.



5 Building Survey

Nipigon District Memorial Hospital consists of 1 health care facility that has been audited for sustainability. Nipigon District Memorial Hospital is an integral part of the communities of the Nipigon community in health promotion, prevention, diagnosis, treatment and patient care. The facility provides a unique component of health care services to the Ontario's north western communities.

The chart below provides a brief site description of the facility involved in this report.

Facility Information	
	Facility
Facility Name:	Nipigon District Memorial Hospital
Address:	125 Hogan Road
Gross Area (Sq. Ft)	40,394
Number of Floors:	1
Year constructed:	1992

Figure 1 Nipigon District Memorial Hospital



6 Energy Use

The following section outlines the energy and water consumption and use for each of the facilities.

6.1 Utility Consumption

Current utilities supplied for Nipigon District Memorial Hospital consists of natural gas, electricity, and water. Utility consumption for each respective energy related utility has been adjusted to fit a regular calendar year below (365 days). Although water is provided to the facility, the consumption is not metered a fixed amount is billed quarterly.

Figure 3: Utility Consumption

Energy/Utility Source	365 Day - Annual Consumption in Units
Electricity (kWh)	1,473,342
Gas (m3)	226,861

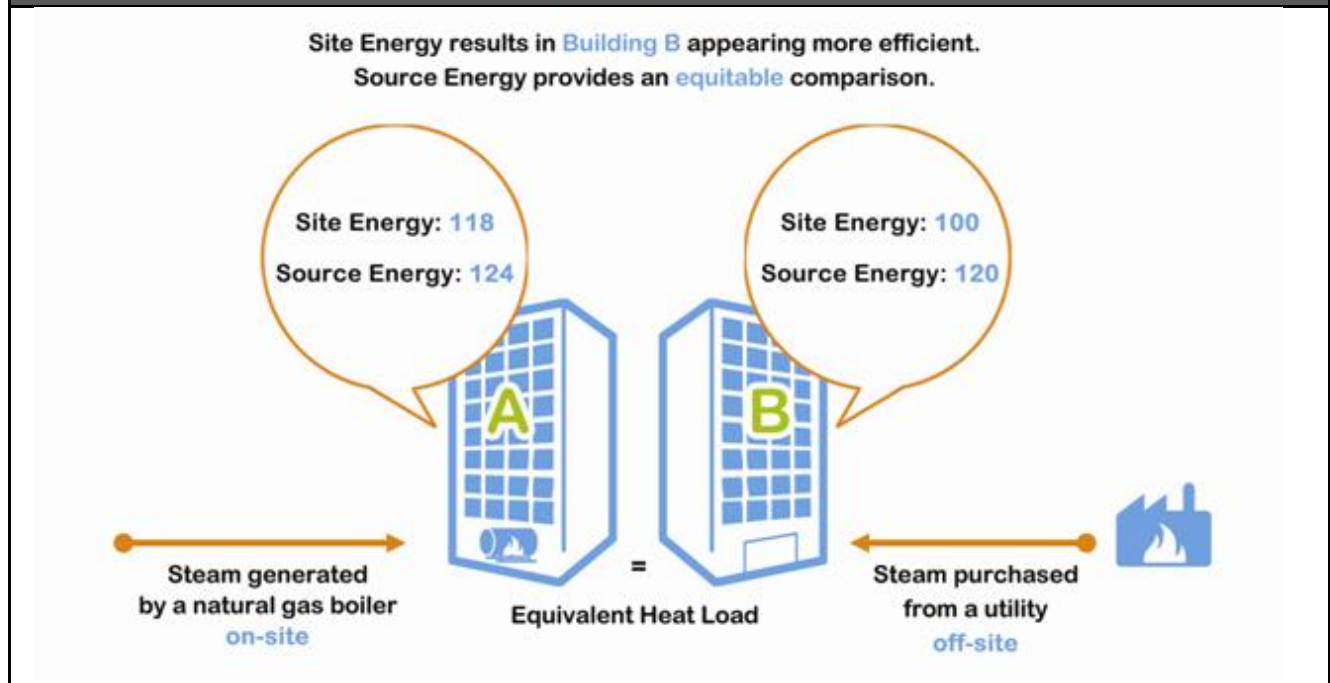
7 End Use - Energy

7.1 ekBtu Overview

An "ekBtu" is a means of converting each respective energy source into a measure of energy equivalent to one thousand British Thermal Units (ekBtu). To be as accurate as possible regarding energy conversions to each respective ekBtu value we provide ekBtu calculations for both Site ekBtu and Source ekBtu.

ekBtu Value	
Site	Convert energy sources to ekBtu based on their equivalent energy use within the facility.
Source	Convert energy sources to ekBtu based on their equivalent energy use within the facility and equivalent energy use required to generate a unit of energy at its source based on the raw fuel input.

ekBtu: Site vs Source Example



When analyzing energy consumption, data is shown using both site and source energy usage in order for the data to be representative of a buildings total output. For example, the picture above, illustrates two buildings, which are identical in their construction and operation and require 100 MBtu of steam for heating. Building A purchases natural gas from a utility to produce steam onsite, whereas Building B purchases steam directly from a utility. That is, Building A is purchasing primary energy while Building B is purchasing secondary energy, and both buildings provide the same amount of heat to meet the demands of the occupants.

8 Energy Utilization Index

The Energy Utilization Index (EUI) is a measure of the facility's energy performance. The EUI is a statement of the number of GJ of energy used annually per square foot of conditioned space. Energy is the equivalent GJ for all energy sources used by the hospital in 2011.

Based on NRCan's 2007 summary report of commercial and institutional consumption of energy survey hospitals ranked the highest energy intensity by sector. Such an amount of energy consumed on site per square foot is the result of specialized and sophisticated equipment, as well long hours of operation.

NRCan surveyed the energy intensity of 703 hospitals in Canada and concluded with an average annual EUI of 2.83 GJ/m²—or 249.18 ekBtu/ft². NRCan segregated this by province and in Ontario the average annual EUI for hospitals is 2.60 GJ/m²—or 228.94 ekBtu/ft².

The EUI for the facility are as follows:

Figure 4: EUI Index Breakdown

Facility	EUI (ekBtu/ft ²)	Comparison to Industry Average
Nipigon District Memorial Hospital	238.79	Nipigon District Memorial Hospital has an EUI that is slightly more than the Ontario hospital industry average

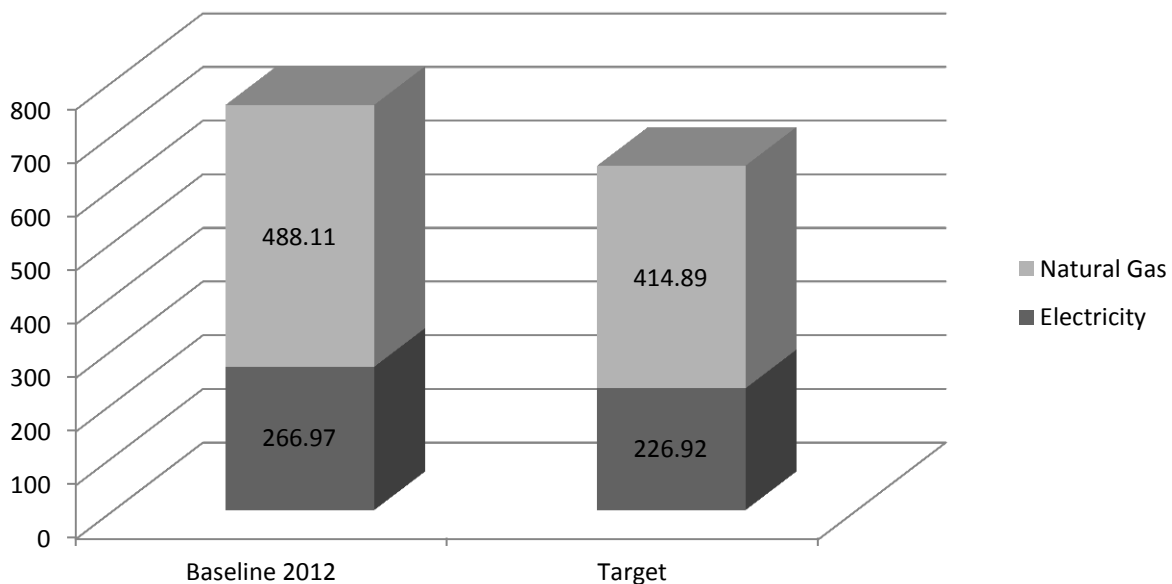
9 Green House Gas Emission Reporting

The greenhouse gas emissions are calculated based on the energy consumption data analyzed. The Baseline is our 2012 emissions and the Target is what we aim to achieve by continuously working on energy conservation measures.

Figure 5: Energy Related Green House Gas Emissions

Utility Type	Units/Year	Tons of CO2
Electricity (kWh)	1,473,342	266.96
Natural Gas (m3)	226,861	488.11
Total 2011 CO2 Emissions		755.08

Nipigon District Memorial 2012 CO2 Emissions



10 Conservation & Demand Management Plan

Conservation & Demand Management requires adequate planning in order to produce long-term success. This section of the report outlines the following:

1. **Current Conservation Strategies**
2. **Proposed Conservation Strategies**

10.1 Current Energy Saving Initiatives

In 2012 the Nipigon District Memorial Hospital entered into a performance contract with Honeywell. This core energy and facility renewal project cost \$1,290,000, and had an estimated payback of 12 years for which Honeywell has guaranteed the energy savings. Nipigon District Memorial Hospital's implemented energy initiatives are summarized in the table below outlining the targeted utilities:

Figure 6: Current Energy Saving Initiatives

Item	Electricity, Gas, and/or Water	Description
Building Lighting Retrofits	Electricity	All lighting retrofitted to new energy efficient T8 lighting.
Upgraded Control System	All Utilities	Installed new DDC control System.
Motion Sensors	Electricity	Motion sensors were installed in a few areas through-out the facility. These sensors were installed in areas such as washrooms.
Upgraded Mechanical System	Natural Gas and Electricity	Installed zone dampers, VSD's on heating and water pumps. Replaced hot water boilers with condensing boilers. Installed condensing DHW heaters. Decommissioned steam boilers & installed gas humidification. Upgraded new sump pumps and controls.
Building Envelope	Natural Gas	Building Envelope had been retrofitted with energy saving measures.
Preventative Maintenance	All Utilities	Facility management proactively maintains all aspects of the building systems to ensure that equipment remains in optimal working efficiency.

10.2 Conservation Measures

The conducted energy audit has revealed several conservation strategies for the facility. The Proposed Conservation Strategies section will outline the following:

1. Priority Levels Overview
2. Overview of Effected Utilities

10.2.1 Priority Levels Overview

In the following section there will be mention of Priority Levels with regards to each Conservation Measure (CM). Priority levels are assigned based on several factors including: paybacks and return on investment calculations, rebates and incentives, understanding facility sustainability goals, and analyzing existing equipment remaining life to assist in selecting appropriate sustainable alternatives.

Figure 7 : Priority Levels Breakdown

Priority Levels	Definition
In Progress	Project is currently underway.
1	These CMs are the highest priority and the process to plan implementation should begin within the next 12 months.
2	These CMs are a high priority and plans should be reviewed with the intention of implementation within the next 24 months
3	These CMs are a medium priority and plans should be reviewed with the intention of implementation within the next 36 months.
4	These CMs are a low priority and plans should be reviewed with the intention of implementation within the next 36 - 60 months.
5	These CMs are the lowest priority, but management plans to explore their opportunities at a later date.

10.2.2 Overview of Affected Utilities

The following table summarizes the recommended conservation strategies that were discovered through the auditing process and outlines what utility costs would be avoided listed by category.

Figure 8: Conservation recommendations breakdown

Item	Priority Level	Utility Effected
Computer Sleep Settings	1	Electricity
Culture Programs	1	Electricity / Natural Gas
Sub-Metering And Monitoring	5	Electricity / Natural Gas
Domestic Water Conservation Program	2	Natural Gas
Energy Misers	2	Electricity
Heating Reflector Panels	3	Natural Gas
Implemented Computer Sleep Mode	1	Electricity

11 Closing Comments

Thank-you to all who contributed to Nipigon District Memorial Hospital's Conservation & Demand Management Plan. We consider our facility a primary source of giving care, and an integral part of the local community. The key to this relationship is being able to use our facilities efficiently and effectively to maximize our ability to provide the highest quality of healthcare services while integrating environmental stewardship into all aspects of facility operations.

On behalf of the senior management team here at Nipigon District Memorial Hospital, we approve this Conservation & Demand Management Plan.



Dan Hill

Chief Financial & Operating Officer

APPROVED