



Conservation & Demand Management Plan

Dryden Regional Healthcare Center
www.drhc.on.ca
397-11: Phase 2
2015-01-15

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. The Dryden Regional Health Care Center community is committed to the path of sustainability, in *all* aspects of our health care facility.

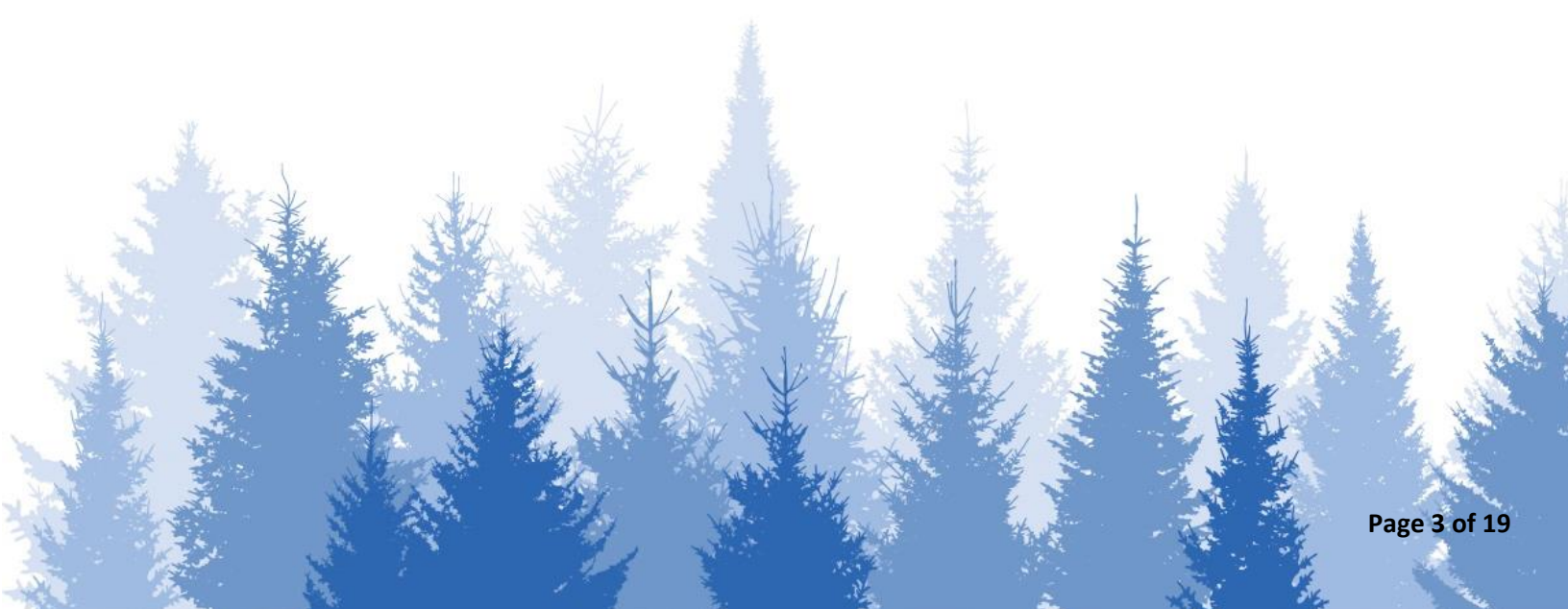
Our Mission

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.

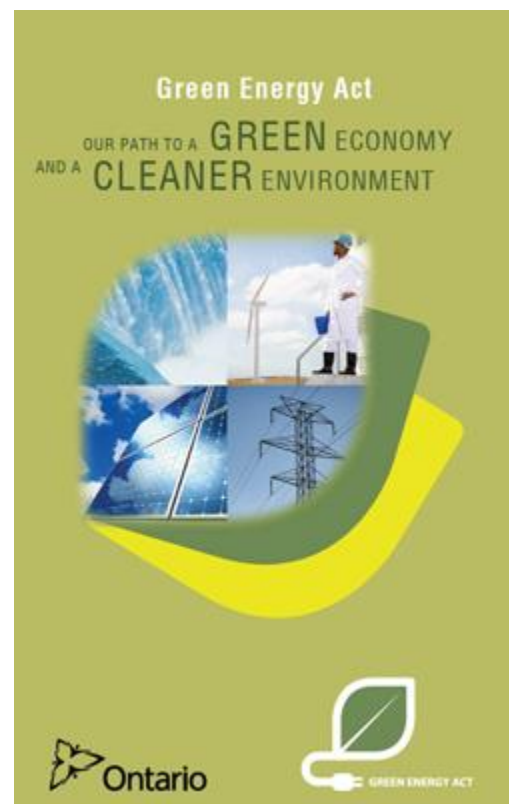
3.1 Promoting Energy Conservation

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 Dryden Regional Healthcare Center 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**. Dryden Regional Healthcare Center'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

Dryden Regional Healthcare Center consists of 1 healthcare facility that has been audited for sustainability. Dryden Regional Healthcare Center is an integrated network involving a program serving the communities of northwestern Ontario in health promotion, prevention, diagnosis, treatment and patient care. Each 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:	Dryden Regional Healthcare Center
Address:	58 Goodall Street, Dryden
Building Square Footage:	75,021
Number of Floors:	3
Building Age:	1956

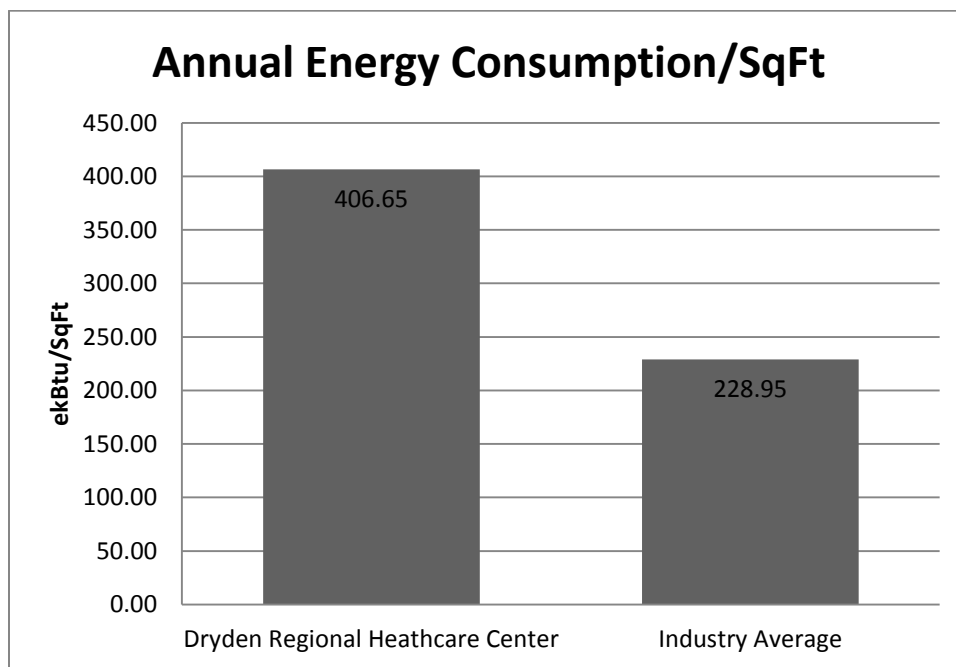
5.1 Industry Comparative

Energy, in cost and resource stewardship is a significant public policy issue. Hospital facilities are among the most energy intensive buildings in the public sector. Hospitals can substantially reduce energy costs while maintaining or improving the quality of patient care. Knowing where your facility stands in comparison to other buildings in the industry can provide insight into opportunities for improvement. Once a baseline is established, management can decide which energy efficient measures will best suit the needs of their facility.

Table 1 - Energy Consumption Summary

Dryden Regional Healthcare Center	Annual Consumption
Energy (ekwh)	30,506,982.84

The figure below compares our annual energy consumption to the industry average provided by Natural Resources Canada (2007).



5.2 Sustainable Measures Summary

The following table summarizes the recommended energy and water efficiency measures discovered throughout the auditing process; and it outlines the impacted utility for each category.

Figure 2: Sustainable Measures Summary



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 Dryden Regional Healthcare Center consists of natural gas, and electricity. Utility consumption for each respective utility has been adjusted to fit a regular calendar year (365 days).

Figure 3: Utility Consumption

Energy/Utility Source	365 Day - Annual Consumption in Units
Electricity (kWh)	2,660,891.00
Gas (m3)	589,670.127



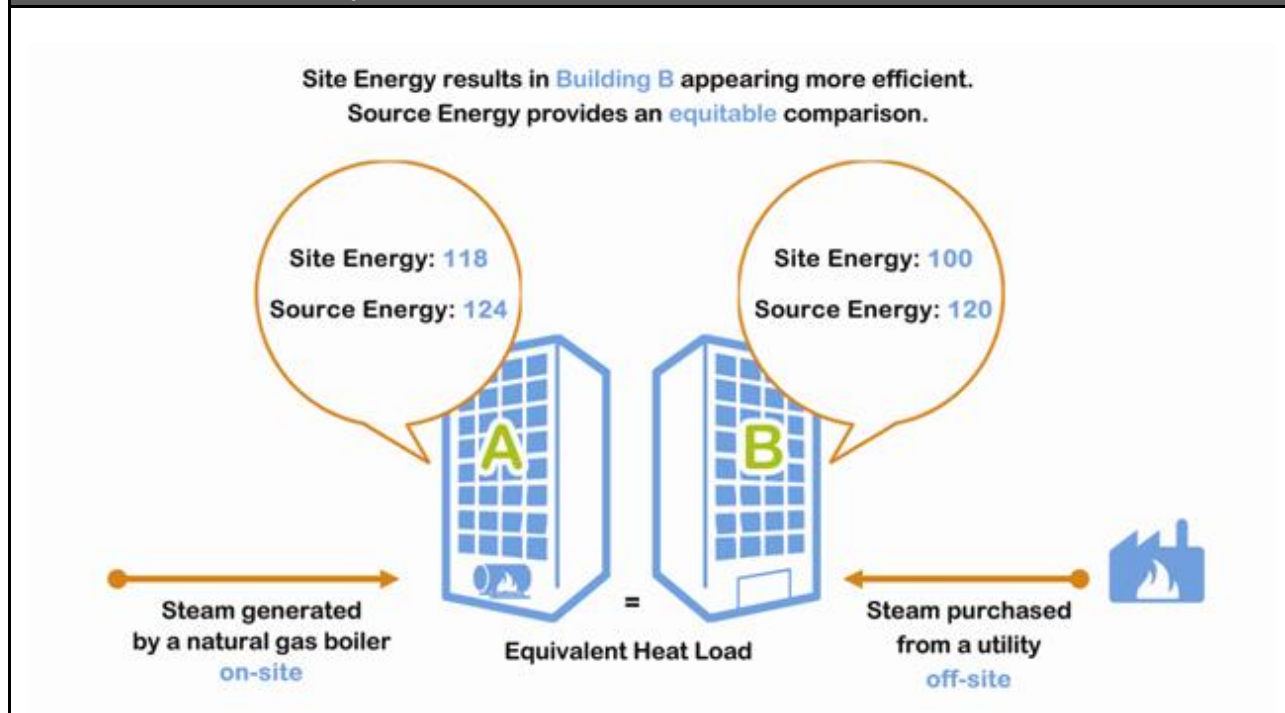
7 End Use - Energy

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 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.

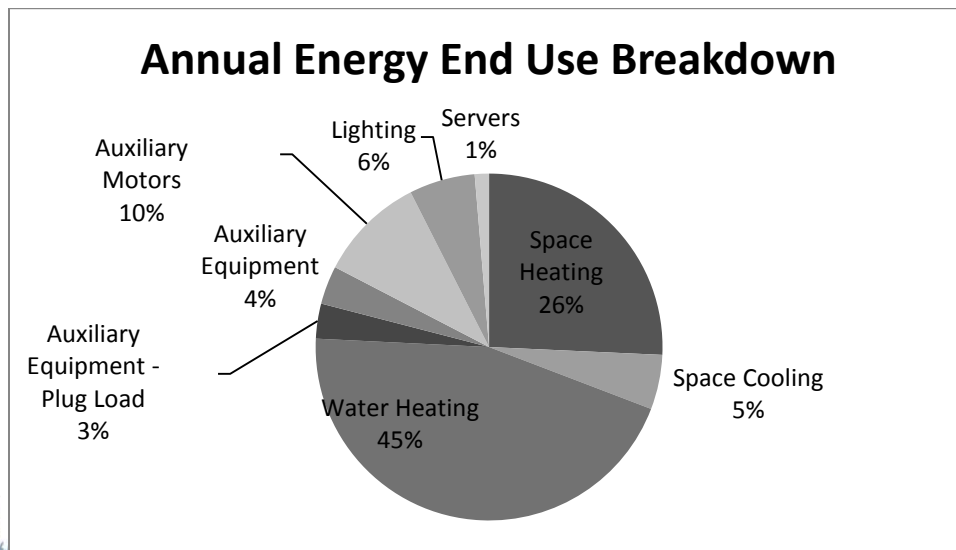
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7.2 Energy End Use

The following information outlines estimates of energy consumption in accordance with Natural Resources Canada Office of Energy Efficiency:

Figure 4: Annual Energy Breakdown

End Use	Estimated Energy Use [ekBtu/Year]	% of Total Energy Use	Notes
Space Heating	7,798,695.60	25.72%	
Space Cooling	1,542,892.75	5.09%	
Water Heating	13,629,327.14	44.96%	
Auxiliary Equipment - Plug Load	987,596.58	3.26%	Including computers, etc.
Auxiliary Equipment - Significant Energy Users	1,086,124.90	3.58%	Medical Equipment
Auxiliary Motors	3,007,217.38	9.92%	Including fans and pumps.
Lighting	1,862,483.19	6.14%	
Servers	401,847.34	1.33%	
Totals	30,316,184.89	100.00%	



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 249.18ekBtu/ft². NRCan segregated this by province and in Ontario the average annual EUI for hospitals is 2.60 GJ/m²—or 228.95ekBtu/ft².

The EUI for the facilities are as follows:

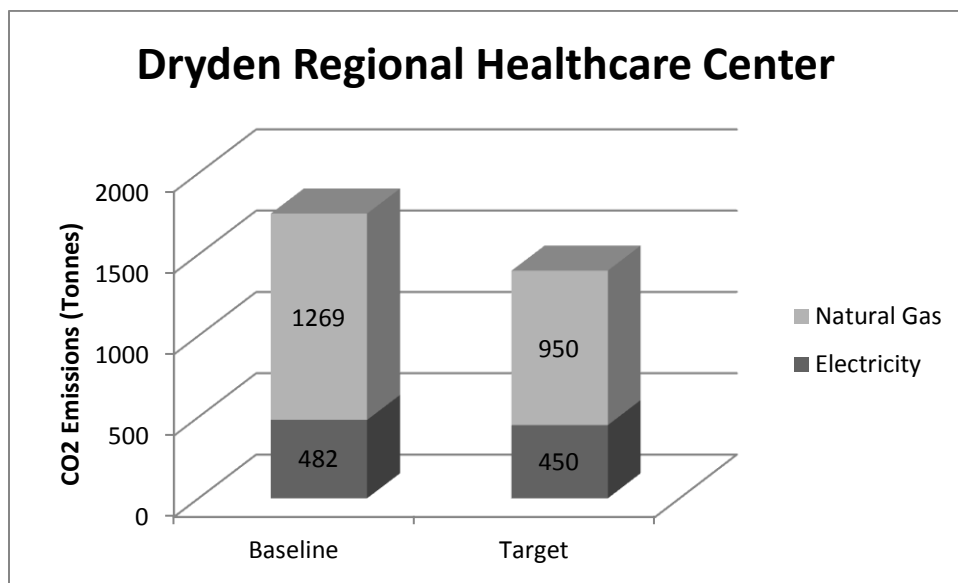
Facility	EUI (ekBtu/ft ²)	Comparison to Industry Average
Dryden Regional Health Care Center	406.41	Dryden Regional Health Care Center has an EUI that is MORE than the Ontario hospital industry average

9 Green House Gas Emission Reporting

The greenhouse gas emissions are calculated based on the energy consumption data analyzed

Figure 13: Energy Related Green House Gas Emissions

Utility Type	Units/Year	Tons of CO2
Electricity (kWh)	2,660,891.00	482
Natural Gas (m3)	589,670.127	1269
Total 2011 CO2 Emissions		1751



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

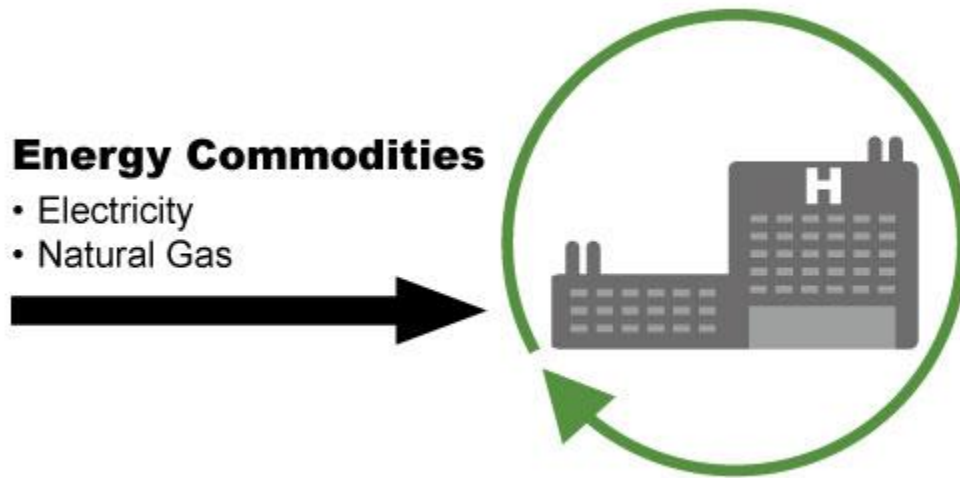
Dryden Regional Health Care Center current energy and water saving initiatives are summarized in the table below outlining the targeted utilities:

Figure 16: Current Energy Saving Initiatives

Item	Electricity, Gas, and/or Water	Description
VFDs	Electricity	Variable Frequency Drives have been placed on the pumps, and on 7 Boilers
BAS	Electricity, Natural Gas	A Building Automation System has been installed.
Fume Hoods	Electricity	Fume hoods were put on timers.
Aerators	Water	Aerators have been installed on water system.
Heat Exchanger	Natural Gas	Heat Exchanger has been installed.
Laundry System	Natural Gas	A cold water laundry system has been put in place.
Heat Reclaim	Natural Gas	Heat Reclaim has been put on exhaust air system.

10.2 Energy Commodities Management

Energy management refers to both how energy is purchased and how energy is used for building operations. An important aspect of energy management is putting in place an adaptable energy commodities procurement strategy to be able to adjust to fluctuating commodity prices. We currently work with Blackstone Energy Management Services Inc. to assist us in our energy commodities procurement. Working with Blackstone allows us to meet or reduce our energy commodity budgets. Our process ensures that resources can be properly allocated to energy and water saving programs.



10.3 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

10.3.1 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.

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

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10.3.2 Overview of Effected 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.

Measure	Impacted Facility	Priority Level
Lighting Upgrades to LED's	Electricity	1
BAS Adjustment for shipping doors	Sustainability	1
E-time Energy Window Treatment	Electricity	1
Computer Settings Changes	Electricity	1
Cultural Sustainability Programs	Natural Gas	1
BAS Adjustment for Exhaust Fan near	Electricity	2
Air Curtain in Entrances and Shipping Room	Electricity	2
Energy Misers on Vending Machines	All Utilities	2
Plumbing fixture upgrades in high traffic areas	Natural Gas	3
Steam Trap Survey and Repairs	Sustainability	TBD
Boiler Stack Economizer	Electricity	TBD
Laundry Heatwheel	Water	TBD
Water System Audit	Sustainability	TBD

10.3.3 Cleaning, Sanatization and Disinfection

Cleaning, disinfection and infection control are important aspects of our hospital environment. As part of our Conservation and Demand Management Plan we believe that the right combination of housekeeping and infection control practices can further support our sustainable efforts while improving patient care. As part of our on-going commitment to sustainability, we are currently reviewing the use of different strategies such as microfiber cleaning systems, antimicrobial coatings, and environmentally friendly cleaning and disinfection products

11 Closing Comments

Thank-you to all who contributed to Dryden Regional Healthcare Center' 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 Dryden Regional Healthcare Center, we approve this Conservation & Demand Management Plan.

Insert Signature

APPROVED

12 Acknowledgments

This report was prepared through a collaboration between the Dryden Regional Healthcare Center executive and facilities management staff, and the Blackstone Energy team.