



Englehart and District Hospital

5-Year Corporate Energy Conservation and Demand Management Plan

July 2019

Prepared in co-operation with:



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Our Commitment to Energy Conservation

ENGLEHART AND DISTRICT HOSPITAL

"Together, We Care"

July 1, 2019

Sean Conroy
VP Corporate Services and Chief Financial Officer
Englehart and District Hospital
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In the spirit of reducing the impact of rising energy costs, and in response to current regulatory requirements, Englehart and District Hospital has developed a new 5-Year Energy Conservation and Demand Management (ECDM) Plan. This Plan outlines our progress against our original 2014 Plan as well as our planned conservation actions forward to 2023. This new plan and its related strategies and initiatives is supported by senior hospital management.

This new Energy Conservation and Demand Energy Management Plan (ECDM Plan) has been updated in response to Ontario Regulation 507/18 made under the Conservation and Energy Efficiency section of the Electricity Act, 1998, requiring all public agencies to prepare, publish and implement an ECDM Plan. Our ECDM Plan fulfils the reporting requirements of the above regulations and provides a framework to support continued energy and sustainability initiatives within the built environment, operations and programs. The Plan further identifies opportunities for continued energy conservation measures and sustainability initiatives to build on our existing plans and conservation efforts. Implementation of all initiatives is subject to future funding availability and budget approvals.

Our ECDM Management Plan has also been developed to address the fiscal, societal, and environmental costs and risks associated with energy consumption. Appropriate energy management will permit Englehart and District Hospital to display leadership, improve the delivery of services, and enhance the overall quality of care.

Warmest Regards,



Sean Conroy
VP Corporate Services and CFO



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Introduction – Executive Summary

Background

The Englehart and District **Hospital's** Energy Conservation and Demand Management (ECDM) Plan was developed **to meet the Hospital's obligations under** Ontario Regulation 507/18. This regulation requires all public sector organizations to complete an update to their original 2014 ECDM Plan by July 1, 2019. This comprehensive Plan is the most an effective method of identifying energy conservation opportunities, selectively implementing the best projects and then measuring their effectiveness. The Plan has been developed to protect the interests of our patients and families and ensure that the hospital obtains the best possible value from our operating budgets. Hospital management believes that a strong commitment to energy conservation and a reduction of energy use is demonstrated evidence of our belief in contributing to a more sustainable community.

Purpose of the Plan

This 5-Year Energy Conservation and Demand Management Plan is designed to guide Englehart and District Hospital towards a more energy-efficient future. The policies, practices and energy conservation measures identified illustrate the importance the Hospital places on acting responsibly towards energy consumption through the wise use of resources in Hospital operations.

To enhance our understanding of energy use and return on investment through conservation, this document contains a thorough review of the measures implemented since the creation of the original Plan, issued on July 1, 2014. Since then, the Hospital has initiated several substantial energy projects, yielding significant savings results, including:

- LED lighting conversions
- Building envelope improvements (windows, doors and roofing)
- Operations equipment upgrades

The wise and efficient use of energy are important options for meeting energy demands. They also provide many other environmental, economic and social benefits, including reducing greenhouse gas (GHG) emissions, cost avoidance and savings.

Following the path of our previous ECDM Plan, this document is a continuation of a process involving the:

- Integration of establishing and evaluating a baseline for performance to be measured against;
- Reviewing the effectiveness of previous conservation efforts while setting future performance goals and objectives;
- Continuous improvement through identification of energy conservation potential;
- Strategic alignment of improvement measure implementation and fiscal constraints; and,

- Evaluation, measurement and communication of results achieved.

The following report summarizes the significant efforts applied by the Englehart and District Hospital Energy Conservation Team to create a Plan that can be implemented responsibly, over time, to create lasting results. The Plan takes advantage of internal expertise as well as all available external financial incentives and rebates currently being offered to support the implementation of energy savings ideas. The current energy picture for Englehart and District Hospital and our future Vision, Goals and Objectives as shown in the Corporate Energy Conservation and Management Policy, are outlined. Our strategic focus areas are discussed in detail and our 5-year Action Plan is laid out.

1.0 Historic Energy Performance

Historical Energy Usage

Effectively managing energy requires the creation of a robust energy monitoring strategy and establishing an accurate energy baseline is an essential first step in this process. This baseline assists with energy conservation and greenhouse gas reduction target setting, energy procurement and budgeting, bill verification, energy awareness, and the selection and assessment of potential energy projects. Englehart and District Hospital, similar to many other hospitals, relies on utility bills to establish this energy baseline.

To evaluate the effectiveness of the **Hospital's** previous energy conservation measures, the year 2013 was chosen as the base year for measurement; this aligns with the Ministry of Energy's Regulation 507/18 requirements for reporting. Overall, the **Hospital's** consumption in 2013 was 513,000 kWh of electricity and 72,000 million m³ of natural gas. This usage equates to spending \$67,000 for electricity and \$23,000 for natural gas for the year (2013).

For comparative purposes, the raw energy consumption breakdowns by month, since the original baseline for the Hospital, are as follows:

Figure 1-1 – Electricity Use (2014 – 2018)

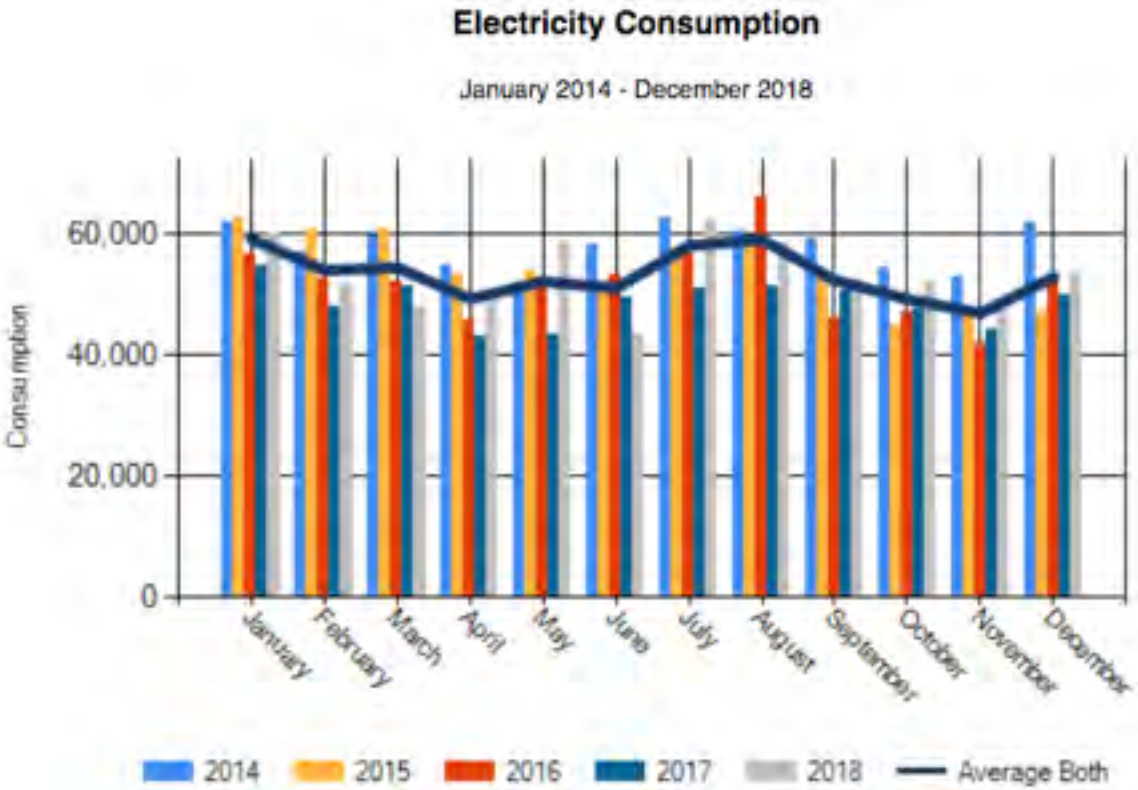
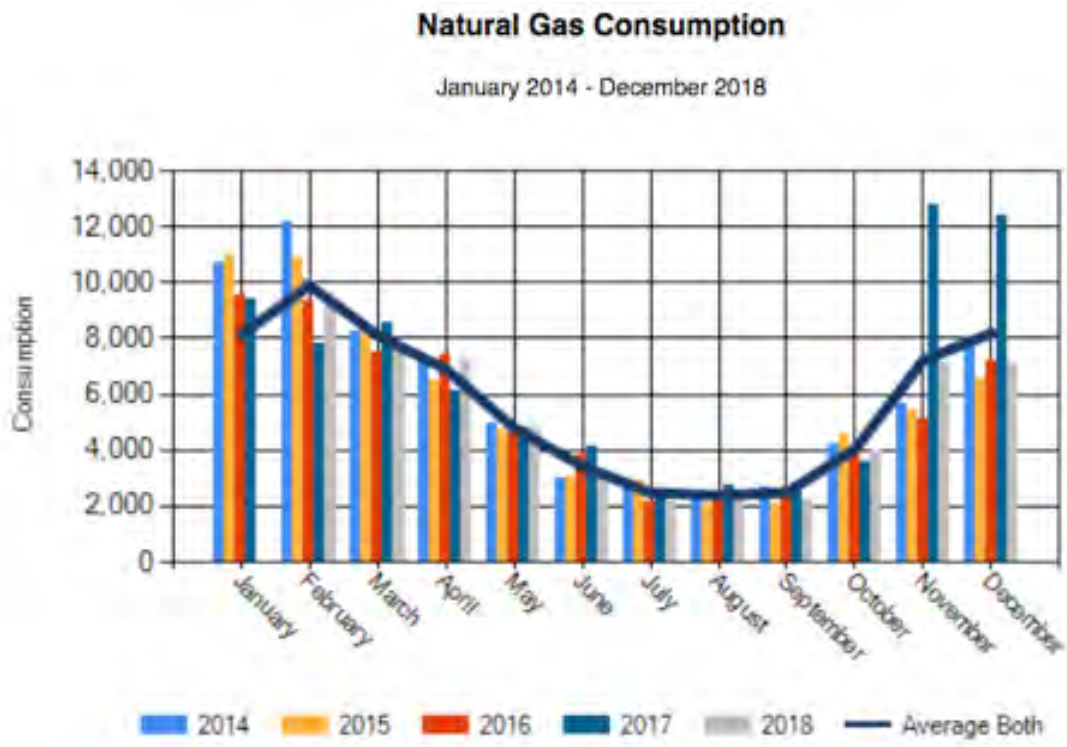
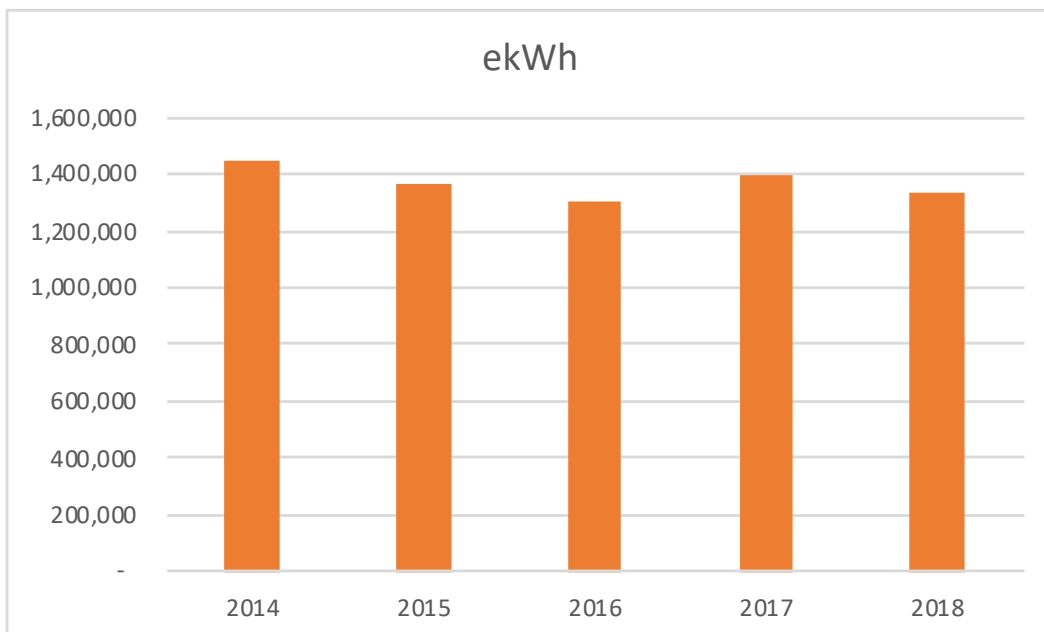


Figure 1-2 – Natural Gas Use (2013 – 2018)



In the original ECDM Plan, no specific reduction target was established. Despite this, the Hospital was able to achieve a net energy savings of 7% when 2018 equivalent kilowatt hours (ekWh) are compared to the original 2013 base year. The use of ekWh allows for an overall energy comparison (natural gas and electricity together). This is illustrated in the graph below:

Figure 1-3 – ekWh comparison (2014-2018)



Englehart and District Hospital Energy Baseline Analysis

The following analysis uses RETScreen analysis of consumption data for the base year (2013) forward. This type of review allows for an objective evaluation of conservation progress by removing the variables that can independently affect energy consumption and are largely out of the Hospital's control (i.e. weather, temperature, cooling or heating degree days).

Figure 1-4 Electricity Baseline and CUSUM Analysis (Main Account 200030401787)



An analysis of the electricity consumption for Englehart Hospital's main electricity account indicates a pattern of savings against the base year of 2014. This indicates that the measures implemented by the Hospital have created a savings of 200,000 kWh since the trend began in mid-2015. This reduction saved the Hospital an estimated \$30,000. A look at the other electricity accounts also reveals a pattern of savings yielding an additional \$7,500 in savings. One note of caution is that the latter half of 2018 shows the savings trend flattening (circled above) indicating a declining rate of savings. This will be investigated and monitored as part of the **Hospital's on-going** Energy Information Management program.

Figure 1-5 Natural Gas Baseline and CUSUM Analysis



Unlike electricity, natural gas consumption does not follow a consistent pattern in any direction. The cyclical nature of the consumption pattern reveals that natural gas use is more efficient during the winter. This means that use of natural gas for non-heating loads is present.

Energy Conservation Project Successes

Since the creation of the last 5-Year ECDM Plan, the Hospital has initiated significant investments in energy efficiency and energy-cost reduction. These projects include:

Facility-Related Projects (2014 to 2019)

Lighting:

- All interior T8 bulbs retrofitted to LED (250 bulbs)
- All exterior lighting, including helipad, upgraded to LED

Building Envelope:

- emergency entrance door replaced with thermal automatic sliding door
- main entrance doors replaced with thermal sliding, exterior/interior vestibule doors that open independently to reduce heat loss (old accessible automatic door opened exterior and interior doors at the same time)

HVAC:

- Dietary department water fed air conditioner (AC) replaced with a new rooftop combined heat/AC unit
- Two 1997 roof top units replaced with two new Heat/AC units
- Entire patient wing domestic hot water line replace with 1-inch insulated copper line
- All patient single coil wall heaters replaced with dual coil, including new electronic wall thermostats

Equipment Upgrades:

- Replaced fire alarm system – inline mack address detectors/enunciators
- Replaced one hot water storage tank
- Replaced CSR instrument washer (HYDRIM L110 G)
- Replaced ice machine dispenser in dietary department
- Removed dietary rethern unit, replaced with heat on demand activator plate system
- Water fed AC unit in stores replaced with new exterior condenser and two head AC units
- Replaced one blanket heating cabinet
- Installed two new half size lab refrigerators (replaced two full sized refrigerators)
- Replaced blood bank refrigerator
- Replaced ultrasound machine
- Replaced portable x-ray unit
- All new LED exit lights
- Replaced 20-year-old water conditioning system with new
- Replaced ceiling suspended electric heaters in mtc garage with new energy efficient units

2.0 Energy Conservation and Management Policy

Our Commitment

Englehart & District Hospital is committed to allocating the necessary resources to implement a strategic Energy Conservation and Demand Management (ECDM) Plan. As an organization, we value the notion of efficient operations and creating a more sustainable hospital.

We are committed to managing energy responsibly and will use energy efficiency practices throughout our facilities, operations and equipment ,wherever it is cost effective and we are able to secure the funding to do so.

Our Vision

Englehart and District Hospital endeavors to minimize energy consumption, related costs, and carbon emissions by continuously improving its energy management practices without compromising the level of service delivery to the community. This **expands on our previous plan's Vision Statement which was "We consider our facilities to be a leader in Quality health care services, an innovative and valued partner in our community, and key to this is the ability to use our resources with accountability."**

Our Goals and Objectives

As part of our 2019 ECDM Plan, the Hospital created several strategic avenues to achieve specific goals and targets with regards to energy management. We have re-examined our past objectives and are re-committing to this updated version.

1. Reduce energy consumption in Hospital facilities by 3% by 2024. compared to our revised base year (2018). This is in addition to the reduction achieved between 2013 and 2018, based on our original 2011 base year.
2. Enhance our culture of conservation through training and outreach to staff, clients and business partners. Through this training employees will have the appropriate knowledge and training to be empowered to reduce energy consumption.
3. Expand upon our comprehensive corporate energy management policy and practices by enhancing key existing business practices to include energy efficiency standards and energy management best practices.
4. Expand our monitoring and tracking program for energy use by providing access to our energy management system to make energy consumption visible to everyone in the Hospital and support facility/management decision-making.

5. Deliver energy cost savings through the identification and implementation of processes, programs and projects that will reduce energy consumption.
 - Re-assess and benchmark the top energy consuming facilities in the Corporation. (2019)
 - Review previously identified energy savings opportunities through review of past energy audits and plan to renew energy audits and analysis of the capital asset renewal program. (Ongoing)
 - Review and/or enhance standard operating and maintenance procedures to include energy conservation best practices. (Ongoing)
 - Seek funding for energy-related projects from various sources to enhance the payback and reduce implementation costs. (Ongoing)

Strategic Action Plan

To achieve our new ECDM Plan, the Hospital will employ the following strategies designed to ensure a positive outcome over the next 5 years. These key strategies support the delivery of our Goals and Objectives.

Strategy 1. Corporate Practices

Develop corporate policies and practices that support the energy conservation effort and show leadership and commitment within the Hospital and community.

- Energy Management Team: Roles, Responsibilities and Accountability
- Energy Procurement

Strategy 2. Education, Awareness & Outreach

Provide the guidance, leadership and framework necessary to empower employees and develop a culture of conservation.

- Energy Skills Training Program
- Energy Awareness Training
- Outreach, Engagement and Recognition Programs
- Feedback System for Employee Suggestions
- Employee Brainstorming Sessions

Strategy 3. Energy Conservation Action Plan and Energy Information Management

Continually identify and deliver energy conservation processes, programs and projects in all areas of the Hospital. Demonstrate sound operating and maintenance practices to complement the energy efficiencies implemented through the capital asset renewal program. Employ a robust Energy Information Management System to ensure that all conservation activities are measured and verified to ensure the City receives and maintains specified energy reductions and savings.

Energy Conservation Action Plan

- Renewed facility energy audits and re/retro-commissioning studies
- Asset renewal plan and energy conservation project delivery
- Standard facility operations procedure review

Energy Information Management

- Maintenance of the online energy monitoring and reporting system (electricity and natural gas)
- Regular Energy Use Review presentations for the community, council, accountable staff and energy users
- Energy bill verification and rate optimization
- Reporting requirements for Regulation 507/18 (formerly 397/11)
- Consistent update and review of key performance indicators (KPIs)/benchmarking
- Standardize and implement project measurement and verification

3.0 STRATEGY 1: Energy Management Corporate Practices

Englehart and District Hospital has implemented essential corporate practices, including key personnel deployment, to ensure a strong focus on energy management and savings. These efforts remain a key component of our renewed ECDM Plan.

The Energy Management Team: Roles and Responsibilities

Energy Leader: Director of Facilities

The Energy Leader is ultimately responsible for creating budgets, securing spending authority and resources for the program. This role is responsible for setting and/or **legitimizing the program's high-level** goals and objectives, keeping track of major project activities and approving resources and funding for the team and its approved projects.

The Energy Leader has direct knowledge of the **Hospital's** major energy-using systems and is responsible for developing and maintaining the focus for the Energy Management Team. The Energy Leader coordinates meetings, sets agendas, and delegates and manages tasks related to the Energy Management Team. This role also helps create the vision for the program and will help the program maintain momentum, particularly when barriers arise, and is responsible for ensuring that the monitoring and tracking systems for energy are accurate, up-to-date and available.

Actions: Continue to seek cross-departmental membership and support for the Energy Management program.

Energy Procurement

The Hospital continues to utilize the natural gas procurement service provided by ECNG. This program provides options for fixed-price energy procurement services, permitting the Hospital to maintain predictable natural gas commodity costs. The program also permits the Hospital to work together with a large number of other municipal entities throughout the province to create bulk-buying power to leverage aggregated energy purchasing opportunities.

Actions: Continue to review the ECNG program annually and evaluate the Hospital's **level of participation. Review potential alternative programs for merit and** analyze the net result of participation annually.

4.0 STRATEGY 2: Education, Awareness and Outreach

The **Hospital's** Education, Awareness and Outreach program provides guidance, leadership and the framework to empower employees and foster our culture of conservation. The program informs the organization of current energy use, operational practices as well as improvement opportunities, while ensuring that all employees have an opportunity to remain informed of the Hospital's **energy** reduction efforts. This continued practice will foster the greatest possible impact of education and awareness.

The program is comprised of the following focus areas:

Energy Skills Training Program

The Energy Skills Training Program is a vehicle for employees to continue to develop a general awareness and understanding of current energy use within Hospital facilities as well as skills to identify opportunities for improvement. The Training Program combines both general knowledge training and hands-on experience to gain maximum benefit.

Employee Brainstorming Sessions are an important part of the Energy Skills Training Program and are encouraged during the Energy Team meetings as a way of generating new ideas for energy conservation. As regular users and managers of Hospital facilities, our staff are one of the most valuable resources to both generate and implement our energy conservation strategies.

Outreach, Engagement, Recognition and Energy Awareness Training Program

The Hospital will continue to engage all users and recognizes that this is essential to the continued success of the energy management program. Our energy program will continue to employ a comprehensive approach to both engagement and recognizing the efforts of Hospital staff who provide important support and ideas.

The Energy Awareness Training Program has been developed to provide consistent energy conservation messaging throughout all departments using Community-Based Social Marketing (CBSM) techniques to engage all users of Hospital facilities. Specific methods used to date include conservation tips, eye-catching posters and other relevant marketing tools.

Feedback System for Employee Suggestions

The Englehart and District Hospital will create a feedback system to encourage employees to provide input and ideas. The suggestions submitted are forwarded to the Energy Management Team to ensure a prompt response. The Energy Leader can engage relevant employees to ensure that all suggestions are captured and explored.

Actions: Review available energy training opportunities both generally (i.e. all staff) and for specific departments. Establish and maintain at least annual Outreach **and Engagement efforts to keep energy conservation 'top-of-mind' for staff and stakeholders.**

5.0 STRATEGY 3: Energy Conservation Activities and Information Management

Energy Conservation Action Plan

The Energy Conservation Action Plan below forms the blueprint for implementing energy conservation and cost saving measures. The Hospital has created a list of potential projects based on previous facility energy audits. The attached action plans have been created to guide this process based on a prioritized implementation schedule. All available incentives and funding sources will be considered to minimize the implementation cost of each measure. In addition to the measures shown, the Hospital anticipates that further energy audits, completed over the next 5 years, will augment the list of available energy conservation measures.

In all, the measures to be implemented in the next phase will include:

- Replacement of 20-year-old boiler heat recovery system
- Replacement of hot water tank (original to build of Hospital). New unit will be gas instead of electric and allow hospital to shut boiler down during summer months (currently use #1 boiler to heat domestic hot water and store in electric water heater; new tank would permit Hospital to heat water two different ways, based on season)
- Retrofit **96" T12 bulbs in mtc garage with 48" LED fixtures**
- Replace 19-year-old x-ray suite with new all-digital suite (summer 2019)

Additional measures will be added as funding becomes available on an annual basis. In general terms, our actions are expected to yield the following results:

- Education, Awareness and Outreach: 1-2% annual energy savings
- On-going regular reviews of consumption and baselines: 0.5 to 1% annual energy savings
- Re/retro Commissioning: 2-7% annual energy savings within the facilities where it is implemented

Actions: Maintain a schedule of energy audit and re/retro-commissioning studies renewals to ensure that our list of measures is up-to-date and that previous measures are still functional and providing savings. Perform periodic reviews of available incentives and stay current on potential sources of money to offset the implementation costs of the proposed future measures. Review the list of measures at least annually and update as necessary.

Energy Information Management

Online Energy Monitoring and Reporting System

Englehart and District Hospital has implemented a system for managing and reporting on its energy consumption (electricity and natural gas). The motivation for **this effort is the notion that "you can't manage what you are not aware of"**. By making our energy usage visual, and keeping the information current, all personnel

will be aware of the information and will benefit from understanding the nature of energy use in our facilities, as well as the impact their actions or inactions have on the Hospital's overall energy cost and budgeting. This information is also key in evaluating the potential of new conservation projects as well as measuring the effectiveness of initiatives already taken.

Actions Continue to gather and upload energy data into the Energy Information Management System regularly and analyze the data for patterns and savings opportunities.

Energy Management Presentations for Accountable Staff and Energy Users

To gain traction for the initiatives within this Plan and ensure that the Hospital reaches its stated reduction targets, it is imperative that information regarding energy usage and cost, as well as the Hospital's energy conservation plans and projects, are well understood and top of mind of everyone from front-line staff to senior management. This broad awareness will lead to additional buy-in and support for the Hospital's continued efforts to reduce its energy usage and spending.

Actions: Make energy a key topic at staff and senior management meetings as well as provide an update on energy use and conservation to senior management, at least annually.

Key Performance Indicators (KPI's) and Monitoring and Verification

To ensure momentum continues, and the Hospital receives value-for-money with regards to its energy conservation efforts, a rigorous program of **establishing KPI's** and then monitoring and verifying ongoing savings is an essential element of this **Plan. By establishing agreed upon KPI's and then performing regular and frequent** monitoring, not only will Hospital personnel be able to verify that savings expected from various projects is achieved, but that the savings continue for the duration of **the project or retrofit's useful life. This practice will protect the Hospital's** investments as well as provide transparency and support for successful savings initiatives.

Actions: Review all conservation initiatives to understand the most appropriate monitoring and verification process. Review the project savings at pre-defined regular intervals and report outcomes to senior management.

Bill Verification and Rate Optimization

A consistent, periodic review of the Hospital's **energy invoices is important to** ensure that rates and recorded consumption values on energy bills is accurate. This ensures that the invoices presented by utilities are correct and are providing appropriate and relevant data to the Energy Management Platforms.

Actions: Perform a rationalization check on monthly invoices and conduct at least annual detailed billing reviews to ensure accuracy.

Ongoing Ontario Regulation 507/18 Reporting

In addition to completing this Plan, the Hospital is required to submit annual energy consumption and greenhouse gas emissions templates to the appropriate Ministry of Energy portal. Gathering and recording monthly energy invoices are necessary to complete these reports.

Actions: Complete all required regulatory reporting by July 1 of each year.