



**Tillsonburg District  
Memorial Hospital**

*Partnering to keep healthcare close to home.*

# **Tillsonburg District Memorial 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



Tillsonburg District  
Memorial Hospital

*Partnering to keep healthcare close to home.*

June 1, 2019

Mike Bastow  
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In the spirit of reducing the impact of rising energy costs, and in response to current regulatory requirements, Tillsonburg District Memorial 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 2024. 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 Tillsonburg District Memorial Hospital to display leadership and improve the delivery of services.

Warmest Regards,

Mike Bastow  
Tillsonburg District Memorial Hospital

## **Introduction – Executive Summary**

### **Background**

The Tillsonburg District Memorial Hospital's Energy Conservation and Demand Management (ECDM) Plan was developed in response to Ontario Regulation 507/18 which requires all public sector organizations to complete an update to their original 2014 ECDM Plan by July 1, 2019. In response to this regulatory requirement, as well as rising energy costs, Tillsonburg District Memorial Hospital has developed this Energy Conservation and Demand Management (ECDM) Plan. This comprehensive Plan is the most 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. In addition to meeting our regulatory obligations, the Tillsonburg District Memorial Hospital believes that a strong commitment to energy conservation and a reduction of energy use is demonstrated evidence of our belief in becoming a more sustainable community while operating in a cost-effective manner that respects the value of taxpayer dollars.

### **Purpose of the Plan**

The 5-Year Corporate Energy Conservation and Demand Management Plan is designed to guide Tillsonburg District Memorial 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:

- A 3-phased retrofit of lighting with LED fixtures (2015-2019). The Hospital received approximately \$44,000 in utility incentives to complete this project.
- Updating of building envelope including roof, brickwork and doors (throughout Plan period)

The above projects have resulted in an estimated annual savings of over \$45,000.

The wise and efficient use of energy are two of the lowest cost 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. Along with the primary benefits, the responsible use of energy also promotes local economic development opportunities, energy system reliability, improved energy supply security and reduced-price volatility.

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 Tillsonburg District Memorial Hospital 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 the Tillsonburg District Memorial 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 also laid out.

## 1.0 Historic Energy Performance

### Historical Energy Usage

Effectively managing energy requires the creation of a robust energy monitoring strategy, and procedures 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. Tillsonburg District Memorial 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 3.2 million kWh of electricity and 780,000 m<sup>3</sup> of natural gas. This usage equates to spending \$379,315 for electricity and \$176,150 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 (2013 – 2018)

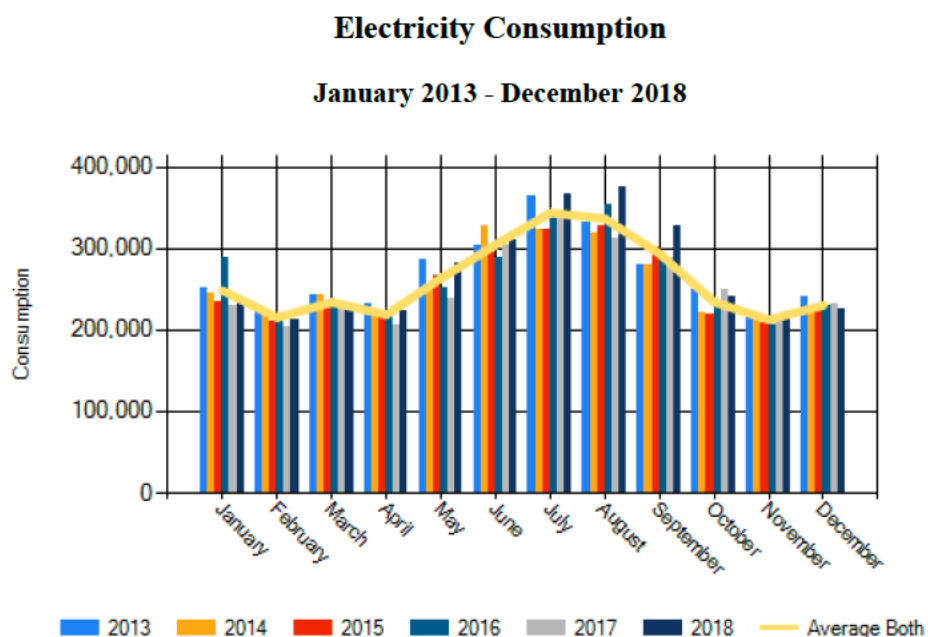
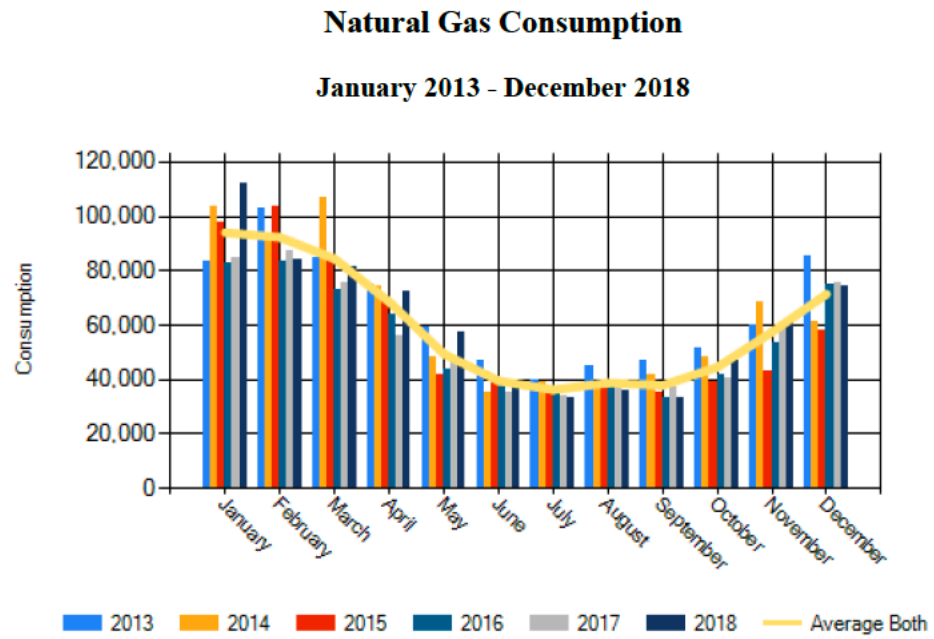


Figure 1-2 – Natural Gas Use (2013 – 2018)



## **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**

#### **2016-2019**

LED lighting retrofits throughout the Hospital.

#### **Throughout the Term of the Plan**

Building envelope improvements including windows, receiving door and roofing upgrades.

## **Tillsonburg District Memorial 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).

In the original ECDM Plan, the Hospital set a target of a 3% reduction in energy consumption over the 5-year term of the Plan (2014-2019). An analysis of consumption data indicates that the Hospital has overachieved its goal by generating an overall reduction in un-weather adjusted ekWh consumption of 4.55% over the 5-year period when compared to the original base year of 2013.

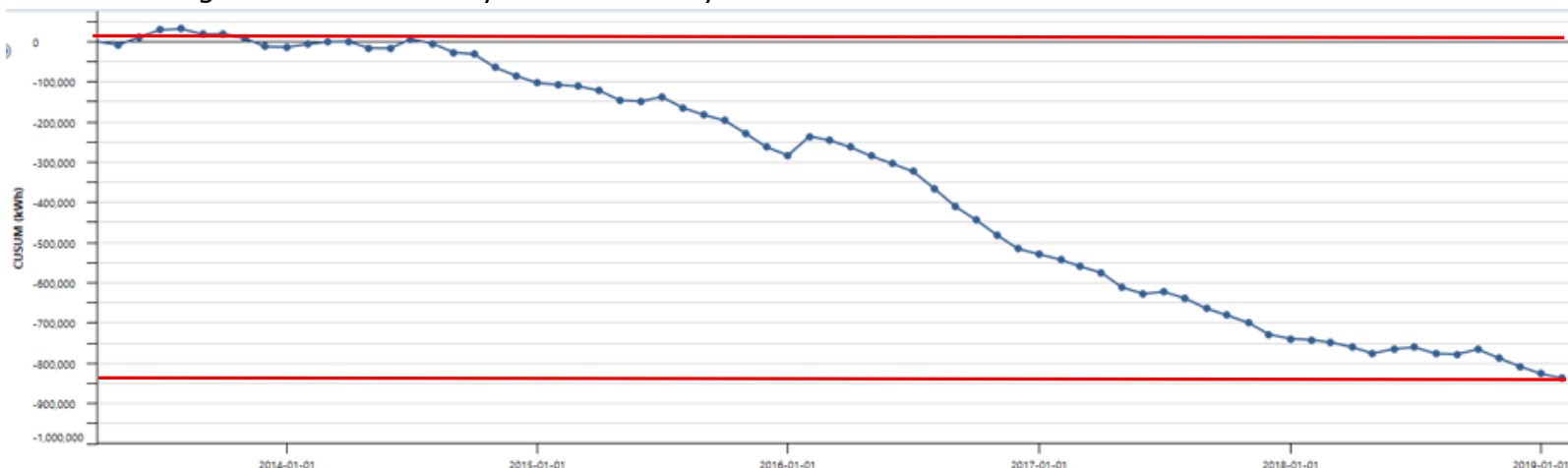
### **Energy Consumption Baseline Analysis**

To fully understand the impact of energy conservation projects on the overall Tillsonburg District Memorial Hospital energy consumption, it is necessary to establish a normalized energy baseline. Creating a baseline illustrates the impact that temperature and weather fluctuations have in determining the true net impact of energy conservation measures. For the purposes of this ECDM Plan, we have used 2013 as the baseline to highlight the net positive influence that conservation has had on overall Hospital energy use since the 2014 ECDM Plan.

### **Electricity Baseline Analysis**

Once we examine the Hospital's energy usage in more detail, it is revealed that significant energy savings were achieved in electricity. This analysis takes into account external factors that can influence the Hospital's energy usage such as weather. The following chart illustrates the savings that the Hospital has achieved over the life of the Plan in comparison to their initial energy usage patterns in 2013:

Figure 1-3: Electricity Baseline Analysis

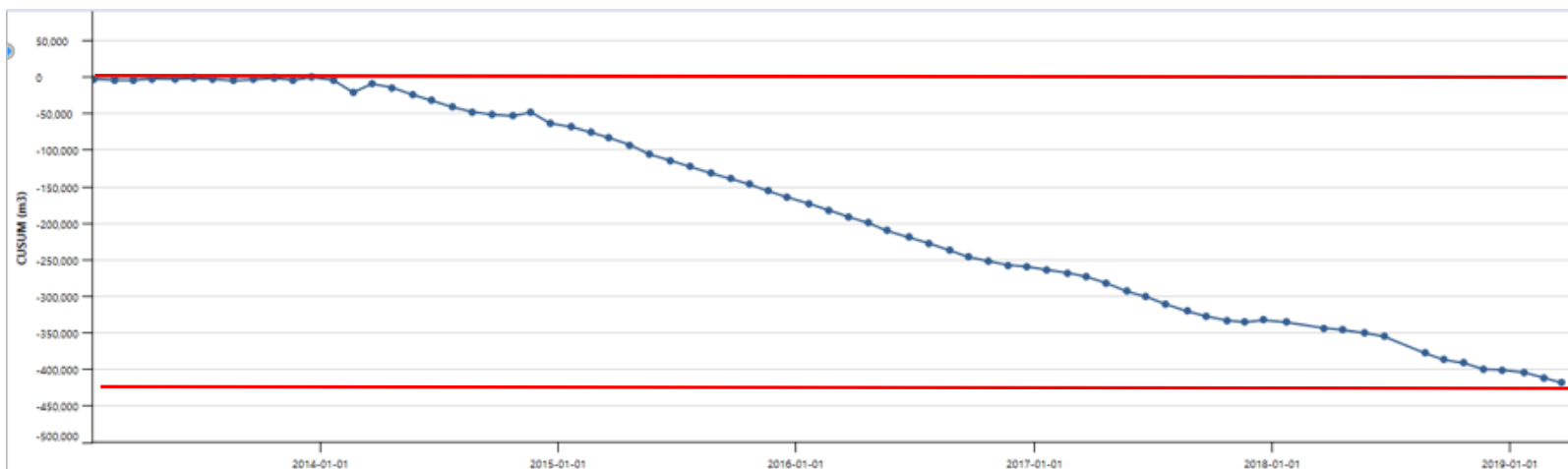


The difference between the two lines means that savings are approximately 850,000 kWh over the 5 years of the plan. This equates to a 4.5% reduction in usage over the 5 years or a 5.4% average decrease annually versus what the Hospital would have used if it had not implemented any projects.

### Natural Gas Baseline Analysis

In terms of natural gas, a similar detailed Baseline Analysis was created. This study reveals a moderate savings trend emerging after a period of initial increase in consumption.

Figure 1-4: Natural Gas Baseline Analysis



Weather-adjusted savings (the difference between the two lines) illustrates savings of approximately 425,000 m³ over the 5 years of the plan. This equates to a 1%

reduction in usage over the 5 years or a 12% average decrease annually versus what the Hospital would have used if it had not implemented any projects.

## **2.0 Energy Conservation and Management Policy**

### **Our Commitment**

Tillsonburg District Memorial Hospital is committed to allocating the necessary staff and resources to develop and implement a strategic Energy Conservation and Demand Management (ECDM) Plan that will reduce energy consumption and its related environmental impact. As an organization, we value the notion of efficient operations and creating a more sustainable facility.

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

### **Our Vision**

Tillsonburg District Memorial Hospital will endeavour 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 hospital community.

### **Our Goals and Objectives**

As part of our 2014 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 weather-adjusted energy consumption in Hospital facilities by 3% by 2024 compared to our revised base year (2018).
2. Enhance our culture of conservation within the Hospital through training and outreach to staff and patients. All employees will have the appropriate knowledge and training to be empowered to reduce energy consumption.
3. Expand upon our comprehensive corporate energy management 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 expanding access to our energy management system to make energy consumption visible to everyone in the corporation 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-audit the Hospital facilities to discover additional savings opportunities as well as monitor and measure the continued savings from past efforts.
  - Review the potential for energy savings through analysis of our 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 three strategic actions 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.

- Energy Management: 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 Hospital receives and maintains specified energy reductions and savings.

#### **Energy Conservation Action Plan**

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

#### **Energy Information Management**

- Enhancement of our energy monitoring and reporting system including our on-going CUSUM analysis
- Regular Energy Use Review presentations for accountable staff and energy users
- Reporting requirements for Regulation 507/18 (formerly 397/11)
- Standardize and implement project measurement and verification

### **3.0 STRATEGY 1: Energy Management Corporate Practices**

Tillsonburg District Memorial 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: Roles and Responsibilities**

##### **Energy Sponsor and Energy Management Champion: Finance**

The Energy Sponsor is ultimately responsible for creating budgets, securing spending authority and resources for the program and is the highest-ranking management person on the Energy Management Team. 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.

##### **Energy Project Implementation and Monitoring Champion: Facility Maintenance Team**

The Energy Project Implementation and Monitoring Champion 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. This role also is responsible for the implementation of the vision for the program and will help the program to maintain momentum, particularly when barriers arise. The Energy Project Implementation and Monitoring Champion is also responsible for ensuring that the monitoring and tracking systems for energy are accurate, up-to-date and available for use by Hospital employees.

##### **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.

**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 Management Team recognizes the value of Education, Awareness and Outreach as key areas to create a culture of conservation. This will be achieved by raising the level of awareness, understanding and general knowledge amongst staff regarding energy spending, usage and conservation. The Hospital will utilize a successful combination of program engagement, direct awareness marketing and hands-on training to enhance our energy reduction efforts to support the achievement of our energy conservation goals and objectives. As well, energy will be a regular agenda item at staff meetings to solicit new ideas for reduction of energy use, promote continued awareness of the cost of energy and ensure that energy conservation remains a key consideration for all Hospital employees.

The 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 staff to develop a general awareness and understanding of current energy use within the Hospital 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 departments, our employees 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 Tillsonburg District Memorial Hospital will continue to engage all users of the Hospital (both staff and patients) 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 engaging employees and recognizing the efforts of staff who provide important support and ideas.

The Energy Awareness Training Program can 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 Tillsonburg District Memorial Hospital will create and employ a feedback system to encourage employees to provide input and ideas. The ideas are forwarded to members of the Energy Management Team in order to ensure prompt response. The Energy Team members 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, stakeholders and patients.

## **5.0 STRATEGY 3: Energy Conservation Activities and Information Management**

### **Energy Conservation Action Plan**

The Energy Conservation Action Plan 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 and facility renewal requirements. These action plans have been created to guide this process based on a prioritized implementation schedule. All available incentives and funding sources will be explored to minimize the implementation cost of each measure. In addition to the measures shown, the Tillsonburg District Memorial Hospital anticipates that further energy audits and retro-commissioning, to be completed over the next 5 years, will augment the list of available energy conservation measures.

The below is a year-by-year implementation strategy. The strategy highlights measures from various areas that will achieve energy savings as well as improve facility functionality and occupant comfort.

In all, the measures include:

#### **Chiller Optimization and Upgrade – Est. 5% Annual Energy Savings**

The Hospital will perform an Optimization Study on the chiller system to improve functionality and reduce energy use. The study will also review the useful life of the equipment as well as the chiller controls.

- Estimated Implementation: 2019-2020
- Estimated Savings: 10% of chiller system usage plus any efficiencies gained through the system upgrade (estimated at 2%)

#### **Building Envelope Improvements - 0.75% Annual Energy Savings**

The Hospital will continue its building envelope renewal program. Annual savings for these measures will vary depending on the type of measure and R-value of the new equipment.

- Estimated Implementation: 2020-2024
- Estimated Savings: 0.75% of overall energy use

#### **Installation of 2 new Generators – Savings unknown at this time**

Two new generators arrived on Hospital premises in March 2019. It is expected these will be installed by March 31, 2020, providing added reliability to the facility's back-up generation capabilities. At present, the generators are not available for demand management purposes. However, the regulatory environment will be monitored for changes to allow these generators to be used for energy management purposes.

## **Energy Awareness, Training and Outreach – 1 to 2% Annual Energy Savings**

Several published studies have identified Energy Awareness, Training and Outreach programs as being one of the best non-capital intensive ways to improve energy performance and achieve savings. By educating and encouraging staff and other Hospital users to be mindful of the energy footprint, a conservation culture can be created where savings ideas are generated and occupants change from struggling to turn things off to a “do I need to turn this on” mindset.

- Estimated Implementation: 2019-2024
- Estimated Savings: 1-2% of overall energy use

**Actions:** Implement the indicated measures according to the proposed schedule and availability of funding. Schedule energy audit and building retro-commissioning 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 up-to-date 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.

**Disclaimer:** *The above-described measures are subject to available funding.*

## **Energy Information Management**

### **Online Energy Monitoring and Reporting System**

The Tillsonburg District Memorial Hospital has been actively managing and reporting on its energy consumption (electricity, natural gas, fuels) since 2011. 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 real-time, all personnel with access to the information can benefit from understanding the nature of energy use in the Hospital, 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 Tillsonburg District Memorial 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 employees to senior management. This broad awareness will lead to additional buy-in and support for the Hospital’s continued efforts to reduce 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 Tillsonburg District Memorial 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 Tillsonburg District Memorial Hospital's investments as well as provide transparency and support for successful savings initiatives

**Actions:** Establish the most appropriate set of KPI's for the Hospital's Energy Management Program. 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.

### **Ongoing Ontario Regulation 507/18 Reporting**

In addition to completing this Plan, Tillsonburg District Memorial 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.