Energy Management Opportunities for Milton Hospital

A Customer Service of Milton Hydro Inc.
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Summary
A site assessment was undertaken by Aladaco Consulting Inc. on behalf of Milton Hydro at the Milton Hospital for Halton Healthcare Services. Milton Hydro Inc. (MHDI) undertakes these assessments to promote energy efficiency and help its customers identify opportunities for cost and energy savings. Certain recommended retrofits will qualify for incentive programs which are designed to provide customers with supporting funding to implement energy efficiency improvements.

A detailed energy analysis was conducted on both electricity and natural gas consumption. Highlights of the energy analysis include:

- There is a very high correlation between weather and electricity consumption and demand
- There is evidence that the mechanical cooling system is being activated early and late in the cooling season when free cooling may be available

When compared to similar facilities, Milton Hospital consumes approximately the same amount of total energy based on 2006 OHA data. Differences from the 2006 benchmark averages are largely in the proportions of electrical and natural gas consumption. The higher electrical consumption at Milton is believed to be due to the existence of large diagnostic imaging equipment that is uncommon (especially in 2006) in small community hospitals.

Based on our analysis and on-site assessment, we have recommended improvements to several hospital systems to lower electricity and natural gas consumption. The financial results of these recommendations are summarized below.

<table>
<thead>
<tr>
<th>Recommendation</th>
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<th>Incentive</th>
<th>Annual Savings</th>
<th>Simple Payback</th>
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<td>$133,640</td>
<td>8.9</td>
</tr>
</tbody>
</table>

The recommendations of this report are, by definition, preliminary. We also discuss further steps that can be taken to validate the potential of these opportunities and funding that is available to assist with this effort.

Finally, we also briefly touch on some alternative approaches to implementing energy efficiency improvements. It is valuable to consider these options early in the planning of your energy efficiency program to minimize delays and create a clear plan for funding and execution.
Background
The objective of this Energy Assessment is to develop a high-level review of electricity and natural gas use at the Milton Hospital and identify areas for efficiency improvement. This assessment is provided free of charge to Halton Healthcare Services for this facility by Milton Hydro as part of their mandate to produce significant electrical demand and consumption reductions in their service territory. The Energy Assessment was prepared by Aladaco Consulting Inc. on behalf of Milton Hydro.

This report will provide guidance and prioritization for further, more detailed audits or studies into specific systems with high conservation potential. These subsequent investigations should enable capital investment with high confidence in the efficiency and financial outcomes. Milton Hydro will continue to support Halton Healthcare Services throughout this process to ensure they can achieve their full efficiency potential and maximize financial resources (incentives) available for these projects.

Because of the interactive nature of some electrical and natural gas-fueled systems, a brief assessment of natural gas consumption and systems is also included. Union Gas will gladly support Halton Healthcare Services in their pursuit of natural gas efficiency improvements through incentives.
Site Conditions

The Milton Hospital consists of a single facility that was built up in stages since the original building was sited in 1959. A second storey addition was completed in 1966 that topped half of the original building. In 1985 a significant 2-storey addition was built on the south end of the existing facility. In 2007, a 2,500 square foot addition was added for a Diagnostic Imaging. The entire facility now encompasses 155,700 square feet of conditioned space.

HVAC Systems

When the South addition was built in 1985, new HVAC equipment was provided to serve the entire facility. Unless otherwise noted, all equipment in the following description is from this 1985 renovation/expansion.

Cooling for most of the facility is provided from a central plant with two (2) Trane centrifugal liquid chillers with combined capacity of 440 tons. The exception to this coverage is the Diagnostic Imaging addition that is served by independent packaged rooftop units with DX cooling and natural gas heating.

The chilled water system is piped in a primary-secondary configuration using 3 HP and 5 HP primary loop circulator pumps and a 30 HP secondary loop distribution pump to distribute chilled water to air handling units. Both chillers share a common cooling tower fed by 10 and 15 HP condenser water pumps. According to Russell Rohr, facility electrician, the larger of the two chillers (280 tons) provides baseload capacity and is supplemented by the smaller chiller (140 tons) as needed. Also, according to Mr. Rohr, the chilled water plant is supposed to be locked out until outdoor temperature reaches 17 degrees C. It is uncertain if this strategy has been maintained – weather normalized data indicates mechanical cooling well below 17C. Also, this temperature is rather high for a lock out. A figure of 14C would be more reasonable. Both chillers now have been retrofitted with new Trane control panels (presumably digital) that were installed quite recently (2011/2012).

Space heating is served by three (3) Weil McLean atmospheric hot water boilers with gross input capacity of 1,656 MBH each. Each boiler is vented independently and no form of heat recovery (economizers) was seen. Each boiler has its own 3 HP primary circulator. One of the boiler circulating pumps was observed to be operating although the boiler was not firing at the time. Secondary hot water and glycol circulating pumps of 25 and 20 HP respectively are located in the basement pump room and distribute the hot water/glycol to air handlers, reheat coils, perimeter radiation, etc. throughout the facility.
Domestic hot water is provided by a separate Lochinvar atmospheric boiler. There was a second boiler in parallel with the Lochinvar unit but we were told it never operates. We could not get close enough to the Lochinvar unit to confirm capacity.

Three (3) Cleaver Brooks steam boilers, each with 625 MBH capacity, provide steam at 90 psi to the facility for process (sterilizers, autoclaves) and humidification. According to Mr. Rohr, the steam plant operates to full capacity in the peak of winter and that it may be supplemented by a new electric steam generator in the future. We strongly advise against this as the operating cost of an electric steam generator is considerably higher than a comparable natural gas fired unit.

Typically, space temperature control and ventilation is provided by constant volume air handlers with terminal reheat coils and perimeter hot water radiation. According to Mr. Rohr, the local pneumatic thermostats were originally designed to sequence the reheat coils and perimeter radiation valves. However, we could not confirm if they were still operating in this manner.

All of the central plant equipment (chillers, pumps, boilers) and air handling units are controlled by a Johnson Controls Metasys® automation system that dates back to the 1985 renovation. This provides basic temperature control and scheduled operation.

In general, it was noted that much of the HVAC equipment appeared to be in good working order. The exception was the boilers which appeared to be showing their age more than other components.


**Lighting**

The common area and patient room general lighting systems in the hospital have been undergoing a gradual, ad-hoc conversion from T-12 lamps with magnetic ballasts to T-8 with electronic ballasts. This work has been undertaken typically when existing magnetic ballasts fail and require replacement. While this has undoubtedly had a positive impact on electricity consumption and lighting quality, the approach has not allowed the hospital to take advantage of supporting incentives. Remaining T-12/electromagnetic fluorescent lights are primarily concentrated in hard to access places like the OR, ER and over patient beds.

Most, if not all of the accent/architectural and exit lights were retrofitted under the same program that saw the conversion of the fluorescent lights over the past 5 years.
Electricity Analysis

Load Profile

Based on past electricity consumption patterns and the observed operation of the facility, we have been able to prepare a profile of electricity use at this facility and how it is being used.

Figure 1 above shows monthly electricity consumption over the past two years as taken from the billing data. This chart clearly shows that electricity consumption rises as outdoor temperatures climb and air conditioning is activated. It appears that consumption in the first half of 2012 was higher than for the same period in 2011, but conversely lower in the latter half of the year. This data has not been adjusted for weather differences in the two periods, so it would unwise to read too much into these observations.
The electrical demand profile shows the same pronounced rise in the summer as cooling loads are activated. However, the peak demand rises sooner and falls later than the electricity consumption. This was more pronounced in 2012 than in 2011 suggesting a change in control strategies. The demand spikes in the shoulder months is a clear indication that mechanical cooling is being activated for short periods of time. The effect is a large increase in billed demand with a negligible increase in consumption.

If we drill down into the hourly load data, we can gain greater insight into the operation of the facility. In Figure 3, we have charted the average hourly electrical load for each day of the week in February. This represents typical ‘winter’ conditions where mechanical air conditioning (refrigeration) is unlikely to be present.
Figure 2 clearly shows a constant baseload of approximately 380 kW exists at all times. This increases rapidly starting around 7 am as the facility commences regular daily activity. Not surprisingly, activity and electrical loads are lower on the weekends when fewer departmental systems and staff are active. During the week, this daily ‘activity’ demand adds approximately 70 kW to the electrical load. Later in the report we reconcile these measured results against major electrical loads in the facility to determine what systems are responsible for each component.

In Figure 4 below, we repeat the same hourly analysis for August. While the same general daily pattern exists, the baseline load is considerably higher (~ 550 kW) and the daily increase is also much larger (125 - 150 kW). In both cases, these are attributable to the added air conditioning load that is present around the clock. It is interesting to note that both the midday peak demand and overnight minimum demand appear to climb as the week progresses from Monday to Friday. Since this pattern does not appear in the February hourly profile, it would suggest that it is due to the operation of the cooling plant.
It is important to point out that the monthly billing demand from Figure 2 will be higher than the corresponding peak loads from the hourly averages in Figures 3 and 4. That is because billing demand is based on the highest 15 minute value in each month whereas the latter charts are hourly averages.

Figure 4 - August Hourly Load Profile Chart
Weather Sensitivity

To accurately determine the impact of weather on electricity consumption, 12 months of billing data was analyzed in the Metrix Utility Analysis software program. Using daily weather data for the area, this program determines the statistical correlation between energy consumption and outside temperatures.

Figure 5 below is a screenshot from the Metrix software system showing the very strong correlation between electricity consumption (kWh) and Cooling Degree Days (CDD).

There are two important pieces of information that we can learn from this analysis. The first is that the balance temperature – the outside temperature where mechanical cooling starts – is calculated to be 8.9 degrees C (47 degrees F). This is quite low and suggests that the HVAC system is not properly using cool outside air for inside space cooling and contradicts the stated operating strategy of the chilled water plant.

To round out the impact of weather on electricity, we also analyzed the relationship with electrical demand (monthly billing demand). See Figure 6 below.
Again, it is apparent that these two are strongly correlated, but most interestingly the balance point temperature for electric demand is just 6.1 degrees C (43 degrees F). Because the weather correlation with demand is not as statistically strong as the correlation with electricity consumption, it would be wise not to read too much into this result except that it is consistent with the interpretation that mechanical cooling is operated for short periods when the outside air temperatures are still quite low.

We believe that all of the major air-handling equipment in the facility has the inherent ability to use cool outside air to satisfy space temperature needs when outdoor temperatures permit (typically below 13C). It is imperative to determine why this is not happening.
Electricity End Use Analysis

The preceding analysis of electricity consumption and weather sensitivity is helpful to understand the operating characteristics of the facility related to schedule and weather. To deepen the understanding of the systems and components responsible for these characteristics, a high level inventory of major building electrical systems was prepared.

Each item was categorized according to type (Plug Load, Lighting, HVAC) and expected operating behaviour/schedule (baseload, night-time, daytime, seasonal). Some assumptions were made about diversity of operation (expected maximum simultaneous operation of that type of component) and the results were reconciled against the actual electrical demand. Figure 7 illustrates the results of the end use analysis. It should be noted that a large electrical demand was allowed for a large piece of diagnostic imaging equipment (MRI or CT Scanner) at this facility. This is included in the Plug/Process load values.

![Milton Hospital Electrical End Uses](image)

**Figure 7 - Electrical Load End Use Breakdown**
When all loads are extrapolated over an entire year based on their expected hours of operation, we can estimate annual consumption attributable to each type. The chart below shows the relative proportion of each of the type of loads used in the previous analysis when viewed on an annual basis.

![Milton Hospital Annual End Use Consumption (MWh)](chart)

**Figure 8 - Annual Electricity Consumption End Use Breakdown**
Natural Gas Analysis

The chart below illustrates the strong winter weather influence on natural gas consumption.

Figure 9 - Annual Natural Gas Consumption

Weather Sensitivity

As with electricity, we used the Metrix Utility Analysis software to determine the statistical relationship between natural gas use and outdoor temperature. As the screenshot below illustrates, this relationship is quite strong.

Interestingly, the balance point temperature – the outdoor temperature below which space heating is required – is determined to be 13.9 C. This is almost five degrees higher than the cooling balance point temperature suggesting a wide range when heating and cooling are acting simultaneously.
The baseload natural gas consumption in this facility would normally be attributed to domestic hot water and sterilization uses. However, it is likely that this is inflated by hot water reheat coils that temper space cooling throughout the year.

Figure 10 - Natural Gas Weather Sensitivity
Comparison with Similar Facilities

It is helpful to compare the energy consumption of the Milton Hospital with other similar facilities. This ‘benchmark’ exercise is approximate at best since no two facilities are physically or operationally identical.

Facilities are compared on the basis of energy intensity – units of energy per unit of interior (conditioned) area. For the purposes of this analysis, we will normalize energy intensity as ‘equivalent kilowatt-hours per square foot’ (ekWh/ft²). For Milton Hospital, the energy intensities are as follows:

<table>
<thead>
<tr>
<th>Energy Type</th>
<th>Baseload</th>
<th>Cooling</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electricity</td>
<td>23.6 ekWh/ft²</td>
<td>4.6 ekWh/ft²</td>
<td>28.2 ekWh/ft²</td>
</tr>
<tr>
<td>Natural Gas</td>
<td>27.3 ekWh/ft²</td>
<td>12.6 ekWh/ft²</td>
<td>39.9 ekWh/ft²</td>
</tr>
</tbody>
</table>

Total energy intensity: 68.1 ekWh/ft²

The most appropriate facility type to compare Milton Hospital with is other Small or Community Hospitals.

Benchmarks we have selected for comparison include:

“Energy Efficiency Opportunities in Ontario Hospitals”, 2006, Ontario Hospital Association

- Based on voluntary survey responses from Ontario Hospitals
- Data for Small Hospitals and Continuing Care/Rehab selected for comparison

US Department of Energy, Energy Star Target Finder

- Based on data from the US Department of Energy Commercial Buildings Energy Consumption Survey 2003
- Data for Hospitals selected as closest comparable building type
- Benchmarks refined to reflect key energy consumption drivers (i.e. number of beds, MRI machines in hospitals etc.)
- Data reflects results for Western New York as closest weather proxy
• Benchmarks prepared for Median, Top 25% and Top 10% targets

The chart below provides a visual comparison of these figures.

![Benchmark Energy Intensity Comparison](image)

**Figure 11 - Benchmark Energy Intensity Comparison**

Natural Resources Canada is undertaking a benchmarking program based on the EnergyStar Portfolio Manager program but it is still in its infancy and cannot provide useful benchmark targets.

The performance of the Milton Hospital is virtually identical to the average for small hospitals from the OHA 2006 Survey. The largest variation is in the mix between electricity and natural gas. It is suspected that the large diagnostic imaging equipment at the Milton hospital explains part of the electrical variation since few of these machines would likely have existed in small hospitals in 2006.
We believe that an aggressive, but realistic goal for a comprehensive energy efficiency program would be to beat the OHA 2006 average by 25%. This would result in energy intensity of 51 ekWh/ft² - challenging, but not impossible.
Recommendations

Based on the high level assessment of the facility, we have identified a number of energy efficiency improvements that may be financially feasible and are worthy of further investigation. For all recommendations, estimates of savings are provided to the extent that they can be estimated with any accuracy. Because incentives are also based on energy savings, we have provided estimates of these as well. Any retrofit cost estimates are guidelines and should be viewed as ‘order of magnitude’ only, particularly HVAC recommendations.

The efforts of Russell Rohr in pursuing energy efficiency at the hospital cannot be ignored. He has provided detailed documentation on all of the efficiency improvements he has undertaken at the hospital over the past 5 years and has ideas for others yet to be done. We have included his recommendations in our own and believe he should be intimately involved with the planning and deployment of all conservation programs at the hospital.

1. Lighting

Lighting recommendations focus on the primary lighting systems and do not deal with secondary architectural or exit lights. It would appear that most of these secondary lights have been replaced or retrofitted over the past five years through Mr. Rohr’s efforts so any remaining opportunities are relatively immaterial.

According to Mr. Rohr and his retrofit documentation, about 85% of the hospital has already been converted to T8 lamps and electronic ballasts. While these efforts are highly commendable, we still recommend a thorough lighting audit of the entire facility. This audit will identify which lighting systems have yet to be retrofitted to T8/electronic ballasts as well as those systems/areas that might benefit from more aggressive re-design (delamping, fixture removal etc.).

For purposes of this analysis, we have assumed that there are approximately 300 general fixtures remaining in the facility that can be converted from T12 to T8 with electronic ballasts. Furthermore, we assumed that most of the over bed lights will need retrofitting as well and this would amount to 130 units.

Mr. Rohr has taken advantage of several opportunities in the hospital for occupancy sensors and timer based lighting controls. There are other opportunities remaining for this type of control, the largest of which is the main hall which has a large skylight running its full length and enjoys lots of natural light. Some form of photocell control to turn off some, or all, of the fluorescent lights would be recommended.
One area where there has been little work done is on outdoor lighting. No allowance is made in this report for retrofit opportunities on these fixtures, but they should be included in a proper lighting audit and retrofit program.

### Financial Summary - Lighting

<table>
<thead>
<tr>
<th>Estimated Cost</th>
<th>Electricity Savings (kWh)</th>
<th>Peak Demand Savings (kW)</th>
<th>Incentive</th>
<th>Annual Savings</th>
<th>Simple Payback</th>
</tr>
</thead>
<tbody>
<tr>
<td>$27,300</td>
<td>84,928</td>
<td>13.9</td>
<td>$7,985</td>
<td>$9,340</td>
<td>2.1 years</td>
</tr>
</tbody>
</table>

#### 2. HVAC - Electrical

There are a number of issues related to the HVAC systems in the facility that have been identified and, if addressed, should significantly improve efficiency. These issues are:

- Uncertainty in the sequencing of local reheat coils and perimeter radiation. According to Russell Rohr, the initial design did have the two heating sources working in tandem as it should be, but it is uncertain if this has been properly maintained. At the very least, a re-commissioning of the local pneumatic controls should be undertaken. Preferably, conversion to digital control as part of a broader retrofit would yield better performance and efficiency.

- Zone hot water reheat coils are a wasteful way to perform local temperature control. A preferable method is to use a damper to vary the volume of air in response to local temperature control needs. If variable air volume control is impractical or unsuitable for the space, the hot water reheat loop temperature should be adaptively controlled to minimize losses and prevent overheating.

- The control strategy for the entire HVAC system is ‘static’ and does not intelligently adapt to changing conditions and demand. Although there is a digital automation system present, the control strategies that it appears to follow are fairly simplistic and could be achieved with pneumatic controls and electric time clocks. Upgrading the automation system and implementing intelligent controls, especially further ‘downstream’ at the local zone level, could dramatically improve efficiency and comfort.

- Most of the hospital is fully ventilated 24x7. Russell Rohr implemented scheduled night and weekend shut down of air handling units serving Stores and
Physiotherapy zones in 2010. It is uncertain if this operating strategy is being maintained, but the intent is excellent. There are many areas of the hospital, such as staff offices and departments with daily schedules that can have the ventilation shut off or significantly reduced during unoccupied hours. Furthermore, in hospitals zones that remain active around the clock, outside air volumes could be reduced at night when occupancy is considerably lighter.

- The secondary circulating pumps are fairly large and operate at constant (full) speed at all times. They do this because the valves on various coils downstream bypass un-needed heating or chilled water rather than throttling and reducing flow. Converting to 2-way valves would enable use of variable speed drives on the secondary loops pump motors.

- The chiller and related components are over 25 years old and considerably lag the efficiency of more modern components. In addition, the operating performance of the system may deviate considerably from original design or nameplate performance warranting re-commissioning if replacement is not considered.

To address these issues, we recommend investigating the feasibility of the following improvements:

1. Perform a detailed heating and cooling load analysis by zone for the entire hospital. This will allow rebalancing of both water and air flows to properly match loads. Most of the subsequent recommendations will succeed only if a proper load calculation is performed to determine zone conditioning needs.

2. Replace existing zone hot water re-heat coils with variable air volume or constant volume control boxes. It is acknowledged that the ceiling space in the hospital is severely restricted so there may be practical limitations to making this recommendation a reality. Whether variable or constant volume, these control boxes can be programmed to shut down, or significantly reduce ventilation during unoccupied periods. A VFD would be required on the supply and return air fans to modulate airflow in response to duct pressure.

3. Convert all 3-way hot water and chilled water valves to 2-way valves to enable throttling of flow at low demand conditions and use of variable frequency drives on the circulating pump motors.

4. Upgrade the entire automation system and extend control down to the local zone level. This will allow the primary HVAC equipment (chillers, rooftop units) to adjust output in response to changing loads rather than coasting along at constant output. New automation technology will also make it easier to monitor operating conditions and alert building operators when systems are out of spec.
5. Replace chillers with modern, high efficiency units. The cooling tower was not observed during the site visit, but it could be a candidate for replacement with higher efficiency draw-through style units. If chillers are not replaced, the hospital should at least consider a comprehensive re-commissioning to ensure the system is operating at its most efficient point.

Financial Summary – HVAC Electrical

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<td>120</td>
<td>$156,400</td>
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<td>9.5 years</td>
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</table>

3. Natural Gas Solutions

Opportunities for natural gas conservation are provided here in very general terms for your consideration and further investigation.

Boiler Plant Refurbishment

The current boiler plant at Milton Hospital segregates the duties for space heating, process steam and domestic hot water to different sets of boilers. While this approach generally provides for greater operating efficiencies through specialization and more closely matching capacity to the load requirements, further savings potential still exists.

We recommend that a comprehensive refurbishment/renewal of all of the natural gas heating systems be considered. New equipment should be selected for maximum operating efficiency and ability to maintain high efficiencies at part load. Modern boiler and control systems have vastly increased part load operating efficiency where boilers spend much of their time.

Savings potential for natural gas should be in the range of 20% of historic natural gas consumption.

Financial Summary – Natural Gas

<table>
<thead>
<tr>
<th>Estimated Cost</th>
<th>Natural Gas Savings (m³)</th>
<th>Incentive</th>
<th>Annual Savings</th>
<th>Simple Payback</th>
</tr>
</thead>
<tbody>
<tr>
<td>$400,000</td>
<td>120,000</td>
<td>$40,000</td>
<td>$38,200</td>
<td>8.9 years</td>
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</table>
Financial Summary – All Measures

<table>
<thead>
<tr>
<th>Recommendation</th>
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Impact on Energy Intensity

The combined impact of the preceding recommendations on energy intensity is summarized below. All values are in equivalent kilowatt hours/square foot (ekWh/ft²).

<table>
<thead>
<tr>
<th>Recommendation</th>
<th>Electricity Intensity Savings</th>
<th>Natural Gas Intensity Savings</th>
<th>Total Energy Intensity Savings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lighting</td>
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</tr>
<tr>
<td>HVAC</td>
<td>5.03</td>
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<tr>
<td>Boiler Plant/HVAC</td>
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<tr>
<td>Total</td>
<td>5.53</td>
<td>8.0</td>
<td>13.53</td>
</tr>
</tbody>
</table>

If the preceding recommendations can achieve these savings, the resulting energy intensity will drop from 68.1 ekWh/ft² to 54.6 ekWh/ft². This is approximately 20% below the starting energy intensity and about 18% below the OHA 2006 average for comparable facilities.
Next Steps

Our assessment has determined that there is a sizeable opportunity for improving energy efficiency and reducing operating costs at the Milton Hospital. As we stated earlier, the assessment was high-level and cannot be used to move directly into design or construction of the recommended improvements. Here we discuss a few paths that you may follow to validate these findings and proceed to construction with confidence.

Detailed Audit

Milton Hydro, through the Ontario Power Authority, and Union Gas have incentives available to financially support detailed energy audits. You can follow this path to gain more certainty about the viability of the recommendations in this assessment before deciding on a contracting approach.

The Electricity Survey and Analysis incentive provides up to $25,000 in funding according to the following formula:

- $0.10/ft$^2$ for the first 30,000 square feet
- $0.05/ft^2$ for areas above 30,000 square feet

The incentive is capped at 50% of total eligible audit costs less any third-party contributions (ie Union Gas Incentives). For Milton Hospital, the potential incentive from the Electricity Survey and Analysis could be:

- $30,000 \text{ ft}^2 \times $0.10 = $3,000$
- $125,700 \text{ ft}^2 \times $0.05 = $6,285$
- Total = $9,285$

To be eligible for this full amount, the eligible audit costs would have to be greater than $18,570.

Additional funding for Detailed Analysis of Capital Improvements and Detailed Analysis of Non-Capital Improvements are also available when following a Electricity Survey and Analysis. The Capital Improvements Analysis is based on $0.05/ft$^2$ up to $10,000. The Non-Capital Intensive funding is capped at $5,000.

For more information go to https://saveonenergy.ca/Business/Program-Overviews/Audit-Funding.aspx.

Union Gas also offers funding for Feasibility Studies based on 50% of eligible costs up to $10,000.
Implementation – Conventional Procurement

Following the audit stage, you will have sufficient confidence in the costs, savings and incentives to embark on project implementation with confidence. Further design engineering may be required to develop specifications and design drawings but the final outcome should still be reasonably certain.

When undertaking a conventional procurement approach, it can be done on a ‘measure by measure’ basis or comprehensively. Organizations sometimes elect to proceed on a ‘measure by measure’ basis, focussing on the low payback options first. The challenge with this approach is that it then becomes harder to secure funding for the longer payback measures that must stand on their own financially. This is particularly true of improvements like HVAC that provide for extensive infrastructure renewal. Unfortunately, this benefit is not well reflected in a simple payback analysis.

The greatest challenge usually faced by organizations looking to implement energy efficiency improvements is access to capital. This assessment has suggested that it would require investment of approximately $1.5 million to have a meaningful impact on your operating costs. This is a sizeable investment and often must compete with other priorities in the hospital that perhaps have a greater impact on patient care.

Implementation – Energy Performance Contracting

An alternative to conventional procurement is to use Energy Performance Contracting (EPC) as the delivery method. EPC is a proven contracting approach used by specialist firms who provide a turn-key solution of design, construction, financing and ongoing performance management. It is well suited to larger projects (> $1 million) that involve a wide range of systems and can generate large energy savings.

EPC offers some advantages over conventional procurement that may be of interest to Milton Hospital

- In-house energy experts who are intimately familiar with the energy implications of design decisions
- Turnkey abilities from audit to design, construction, commissioning and ongoing performance management
- Ability to provide 3rd party financing for construction to avoid competing for limited internal capital
- Energy savings performance guarantees to ensure the financial viability of the project

EPC has been used extensively in the public sector in Canada and there a numerous local firms that have the resources and expertise for a project like this one.