

# **Georgian Bay General Hospital**

## **Strategic Energy Management Plan**

### **2014**



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## INTRODUCTION

Georgian Bay General Hospital's strategic energy management plan (SEMP) and policies are intended to promote responsible stewardship of our environment and community resources. Two of Georgian Bay General Hospital's core values are Dependability and Excellence. The energy management program will further these core values by increasing operational efficiencies, reducing costs, and enabling the Hospital to provide compassionate service to a greater number of persons in the community.

- Utility and energy related costs are a significant part of overall operating costs
  - ECNG<sup>1</sup> utility bills, including electricity, natural gas, and water use in 2012 were \$294,334.00 for the Midland site and \$61,490.57 for the Penetanguishene site, for an overall cost to the organization of \$355,824.57.
- With energy management an integral part of business decisions, Georgian Bay General Hospital can expect the following:
  - 3% reduction in energy use, with an overall reduction of 5% in utility use and costs
  - Energy efficiency measures have already demonstrated significant savings in 2013 at the Midland site, as record by Blackthorn Management Inc. (see Appendix)
- Recent activity (last five years) associated with managing these costs include the following:
  - Boiler plant replacement
  - Steam and condensate return distribution system improvements and replacement
  - Lighting redesign replacement and sensors
  - Selective ventilation system modifications
  - Optimization of BAS programming strategies
- To further strengthen and obtain full value from energy management activities, a strategic approach will be taken: the organization will fully integrate energy management into its business decision-making, policies, and operating procedures.
- Active management of energy related costs and risks in this manner will provide a significant economic return to the organization and will support other key organizational objectives.

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<sup>1</sup> ECNG Energy is the energy procurement organization which supplies Georgian Bay General Hospital's energy.

## **ENERGY MANAGEMENT VISION**

Georgian Bay General Hospital's mission is to be 'vibrant, progressive and a partner in inspiring a healthier community.'

Therefore, we consider our facilities both as a primary source of care and as a leader in moving our community forward to greater overall health. It is critical to our mission that our facilities model an efficient, effective environment of care for our community. Enhancing efficiency in our use of facility resources will enable Georgian Bay General Hospital to direct more resources toward patient care and the relief of illness and suffering. As well, by reducing our ecological footprint, we are doing our part to create a healthier environment. This is essential to our community's health and in inspiring progress toward a healthier future.

Thus, Georgian Bay General Hospital's energy management vision is to improve energy efficiency and reduce waste by improving infrastructure, by developing forward-thinking policies and processes, and by incorporating new best practices and technologies.

## GUIDING PRINCIPLES FOR STRATEGIC ENERGY MANAGEMENT

Georgian Bay General Hospital's energy management plan will be guided by these principles:

***Taking A Strategic Approach:*** While Georgian Bay General Hospital actively manages energy and utility costs by implementing opportunities as they are identified, by acting strategically, the Hospital can significantly improve its energy-related performance. Internalizing energy and utility management into our organization's every-day decision-making, policies, and operating procedures will help assure substantial and long-lasting reductions in energy use throughout Georgian Bay General Hospital.

***Supporting Mission-Critical Goals:*** Strategic energy management will directly support Georgian Bay General Hospital's mission-critical goals of caring for the environment and the community. It will also help the Hospital to optimize the healing and working environment; improve the hospital's financial bottom line by reducing unnecessary energy and utility costs; and optimize the capacity of existing energy systems to meet current and expanding operational needs. The impacts of Georgian Bay General Hospital's energy management efforts on those goals will be tracked and reported wherever possible.

***Fostering Organizational Commitment and Involvement:*** Executive and organizational commitment and involvement is critical to successful strategic energy management. Upper management at Georgian Bay General Hospital will work with facility managers and other key staff to ensure that adequate organizational support and resources are provided to maximize the benefits of energy and utility management. The President & CEO will sign a Letter of Commitment emphasizing the importance of energy management to the Hospital's mission. Energy and utility management will be integrated into the strategic planning and capital budgeting processes.

***Obtaining Sustainable Financial Returns:*** Energy management investments will yield solid economic returns that meet Georgian Bay General Hospital's expectations on Internal Rate of Return and Return on Investment. Georgian Bay General Hospital will apply consistent financial analysis methods that reduce total cost of facility ownership and operation.

***Using Available Resources and Assistance:*** Georgian Bay General Hospital will use national, regional, and local sources of strategic, technical, and financial assistance to help achieve our energy management goals. These include programs through local distribution companies, the Ontario Power Authority, saveONenergy, ENERGY STAR, the Canadian Coalition for Green Health Care, The Canadian Healthcare Engineering Society, and Natural Resources Canada. The organization will also work within existing relationships, such as ECNG, to explore and exploit further opportunities for improving energy efficiency.

## THE BUSINESS CASE FOR STRATEGIC ENERGY MANAGEMENT

Below are the central business arguments for Georgian Bay General Hospital's pursuit of strategic energy management. The next section then presents the business proposition – the results of analysis of the energy efficiency opportunities and their associated costs and internal rate of return.

### ***Strengthened Community Leadership and Environmental Stewardship***

Energy management is a visible, public commitment to the community and environment. Through aggressive energy management, Georgian Bay General Hospital can provide leadership in promoting sustainable communities, efficient business practices, and environmental stewardship. This is an excellent opportunity to provide leadership and reduce costs at the same time.

### ***Enhanced Healing and Working Environment***

In existing facilities, efficient operating practices improve patient as well as employee comfort with more stable air temperature, better indoor air quality, and lighting. By way of an example, recent research has found that daylight eases surgical pain and contributes to substantial savings in pharmaceutical costs.

### ***Improved Financial Health and Operating Cost Reduction***

Strategic energy management presents a highly leveraged opportunity to reduce operating costs and positively impact Georgian Bay General Hospital's bottom line. Dollars of operating cost savings directly improve the operating margin. Further, investments in energy projects typically have a lower risk of performance over time relative to other investments and savings from energy projects are easier to forecast reliably than savings or revenue increases expected from more variable types of investment.

### ***Optimization of Capacity to Meet Operational Needs***

Energy efficiency optimizes overall equipment/system operation so that system capacity can be reclaimed for current and expanding operational needs. This "free capacity" can eliminate the need to add major new infrastructure is far less expensive.

## **BUSINESS PROPOSITION**

- If energy management considerations are integral to relevant business practices, policies, procedures, and decision-making processes, Georgian Bay General Hospital's energy and utility related costs can be reduced by an additional 5% over a 5 year period.
- Based on 2013 utility rates, this will result in \$3,600 in annual value to the bottom line per year, or a total \$18,000 over a 5-year period. Integration of energy management into organizational decision making and business practices will continue to produce value annually for a much longer period of time.
- To support the achievement of these financial benefits, Georgian Bay General Hospital will invest in energy-related capital and operating improvements.

## **ENERGY MANAGEMENT GOALS, TIMELINE, RESPONSIBILITIES**

The following outlines some of the energy management goals that will be adopted by Georgian Bay General Hospital, as well as the targeted timeline and primarily responsible departments for each goal. The goals include, but are not limited to, the following:

1. SEMP Approval, Identification of Resources for Implementation
2. Implement Financial Practices and Decision-Making Processes
3. Establish Purchasing Specifications for Energy Efficient Equipment and Services
4. Improve Building Operating Performance
5. Implement Energy Efficient Facility Upgrades

### **Goal 1: SEMP Approval, Resources for Implementation (Year 1)**

*Primary Responsibility: Executive Team*

- Executive approval process adjustments and resource allocations to support initiatives.
- Support from key staff (financial management, purchasing/procurement, construction, building operations, etc.); CEO signs letter of commitment.
- Creation of mechanisms/processes to make resources available.
- Clarification and communication of staff roles and responsibilities, performance goals, and energy management reporting.

### **Goal 2: Implement Financial Practices and Decision-Making Processes (Year 2)**

*Primary Responsibility: Executive Team, CFO*

- Money spent to achieve energy efficiency is viewed as an investment, not a cost.
- Decisions about energy management investments will be part of Georgian Bay General Hospital's high-level, long range process of budgeting for capital and operations.

### **Goal 3: Establish Purchasing Specifications for Energy Efficient Equipment and Services (Year 3)**

*Primary Responsibility: Purchasing Department, Green Team*

- Establish and consistently use purchasing specifications that minimize life-cycle costs for energy efficient equipment and services.
  - Establish efficiency specifications for standard equipment routinely replaced (e.g. lights, motors, and unitary HVAC equipment).
  - Establish efficiency guidelines for custom equipment purchases (e.g. chillers).
  - Adoption of ENERGY STAR requirements as a consideration for all purchasing of electrical devices.
  - Staff education on ENERGY STAR and energy use reduction by user group.

#### **Goal 4: Improve Building Operating Performance (Year 2-3)**

*Primary Responsibility: Facilities Department*

- Equipment tune-up and improved operations and maintenance (O&M) will achieve the following results while supporting patient care, and facility comfort and safety.
  - Achieve reductions in utility related operating costs for existing facilities by an average of 5% over 5 years and continue to improve by 1% per year for 5 years thereafter.

#### **Goal 5: Implement Energy Efficient Facility Upgrades (Year 1-5)**

*Primary Responsibility: Facilities Department*

- Specific equipment upgrades will improve energy efficiency over the next five years. These upgrades will proceed strategically on a specific timeline and be supported by improved O&M practices.
  - Steam trap audit/repairs - 2014
  - Parking lot lighting and exterior building lighting - 2014
  - Domestic Hot Water Upgrades - 2014
    - Replace existing system
    - Substantially reduce water demand and consumption
  - Heating, Ventilation, and Air Conditioning Upgrades - 2015
    - System effect improvements
    - Fan speed adjustments to restore building balance and net pressure relationships
    - Ensuring that all air handling units are maintained and fans inspected and sheaved properly as regular maintenance practices
    - Ensuring that all outside dampers are opened and closed properly by the automation system through visual inspections
    - Air Handling Unit Replacements
    - Exterior window assessment
  - Building Automation System Upgrades - 2016
    - Add free-cooling strategies, requiring reduced system effects
    - Maintaining Building Automation Strategies and Shutdowns
  - Chiller Plant and Cooling Tower Upgrades - 2017
    - Primary secondary piping arrangement
    - Add side-stream filter for cooling tower
    - Improve water treatment for chiller and tower
  - Boiler Plant Upgrades - 2018
    - Add plant instrumentation

## **BASELINE ENERGY USE**

The baseline energy profile has been obtained using the most recent full calendar year with available utility data, which is 2012. Exhibit 1 presents the baseline energy use and costs for the Midland and Penetanguishene sites; Exhibits 2-4 present the monthly data for electricity, natural gas, and water use respectively at each site.

### **Key Observations**

A review of the baseline energy cost profile reveals that:

The total annual utility costs for the Midland and Penetanguishene sites in 2012 were \$355,824.57, as billed by ECNG. Natural gas use represented a slightly larger proportion of this cost than electricity.

The annual total electrical consumption for the two sites was 5,038 MWh (82% Midland) and the annual total gas consumption was 995,811 m<sup>3</sup> (86% Midland).

The two sites have similar usage profiles for both electricity and natural gas. The Midland facility accounts for the majority of Georgian Bay General Hospital's total energy use and costs (83% of cost).

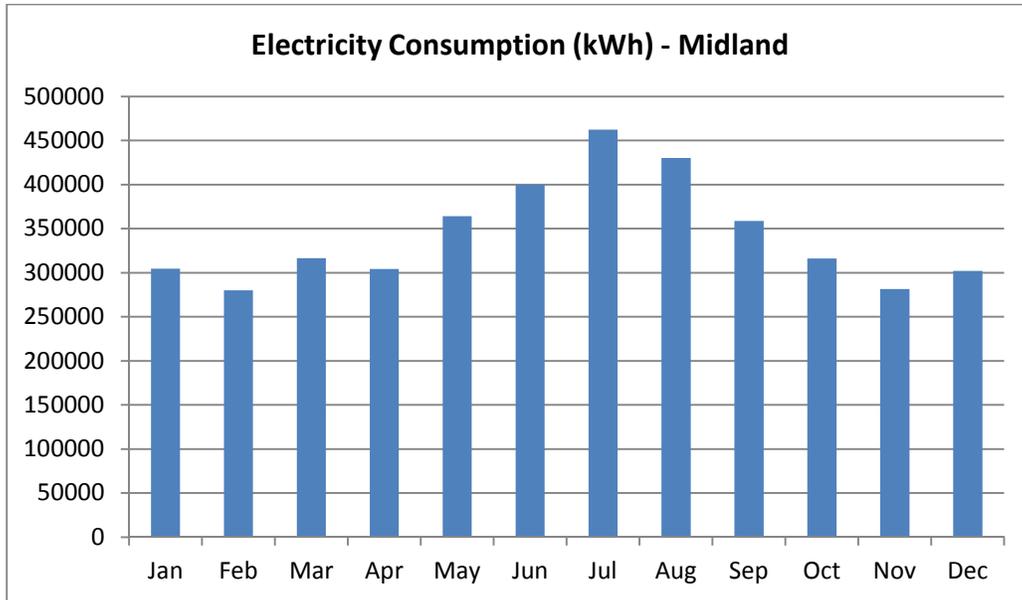
### Exhibit 1 – Baseline Energy Consumption

Midland Site				
2012	Electricity (kWh)	Natural Gas (m <sup>3</sup> )	Water (m <sup>3</sup> )	Total Utility Cost (\$)
Jan	304,455	121,565	4,777	25,417.00
Feb	279,835	88,102	4,471	24,744.00
Mar	316,608	108,672	4,362	18,464.00
Apr	304,348	92,096	4,846	21,359.00
May	364,138	77,836	4,049	24,734.00
Jun	399,986	58,100	4,432	25,151.00
Jul	462,237	54,632	4,444	32,333.00
Aug	430,271	43,497	3,846	24,130.00
Sep	358,627	37,743	3,920	26,466.00
Oct	315,957	44,957	3,295	21,916.00
Nov	281,400	57,105	4,196	24,545.00
Dec	301,904	67,192	4,470	25,075.00
<b>Total</b>	<b>4,119,766</b>	<b>851,497</b>	<b>51,108</b>	<b>294,334.00</b>

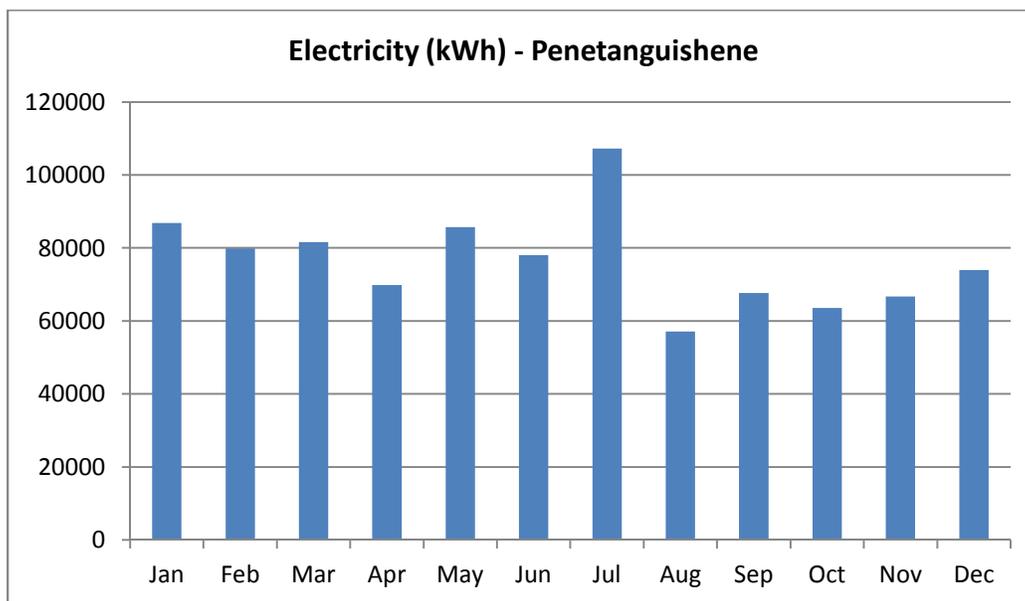
Penetanguishene Site				
2012	Electricity (kWh)	Natural Gas (m <sup>3</sup> )	Water (m <sup>3</sup> )	Total Utility Cost (\$)
Jan	86,850	19,514	1,200	5,194.19
Feb	79,874	26,739	1,440	4,466.74
Mar	81,594	12,598	1,473	7,270.15
Apr	69,840	11,740	1,524	3,965.97
May	85,680	4,246	1,551	4,736.75
Jun	78,000	2,029	1,663	4,563.87
Jul	107,280	1,226	1,872	7,110.18
Aug	57,120	2,375	1,865	5,479.41
Sep	67,680	7,460	1,727	4,843.78
Oct	63,600	19,882	2,126	4,044.30
Nov	66,720	12,144	1,515	4,876.72
Dec	73,920	24,361	1,604	4,938.51
<b>Total</b>	<b>918,158</b>	<b>144,314</b>	<b>19,560</b>	<b>61,490.57</b>

## Exhibit 2 – Monthly Electricity Consumption

Exhibit 2 shows the monthly electricity use profiles for both sites. Data for the Midland site shows peaks gradually increasing through the summer with greater cooling demand, reaching approximately a 50% increase over baseload at maximum.

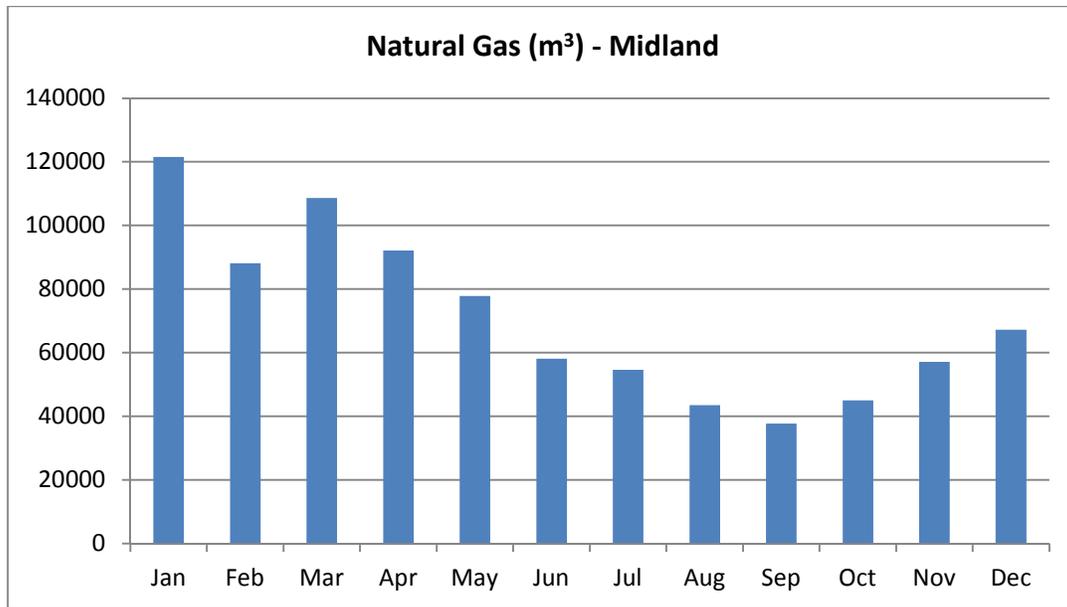


For the Penetanguishene site, electricity use peaks in the summer with increased cooling demand, and also experiences a smaller increase over the baseload during the winter due to heating demand.

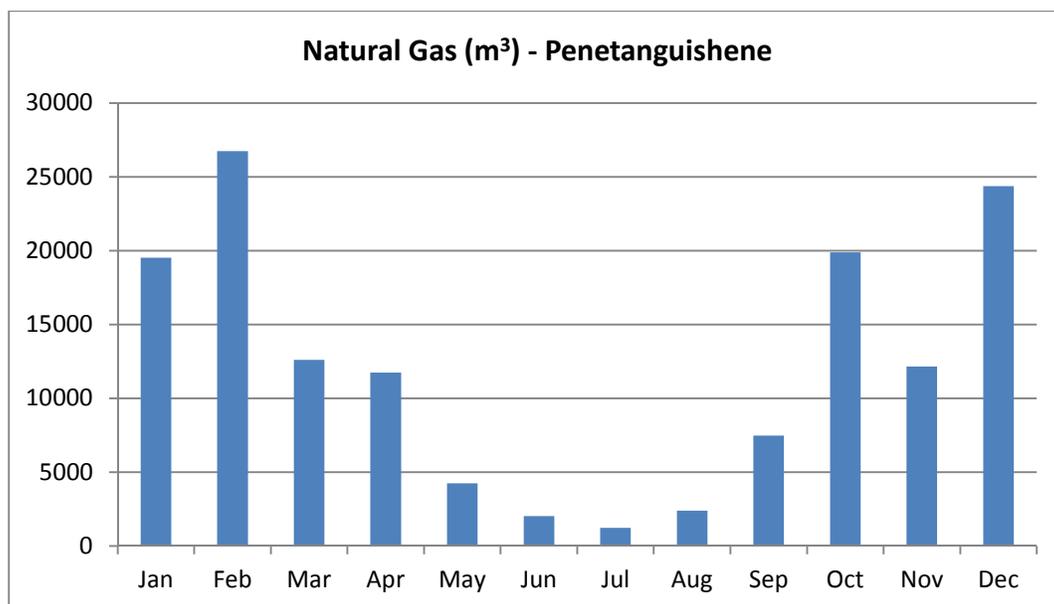


### Exhibit 3 – Monthly Natural Gas Consumption

Exhibit 3 shows the monthly natural gas use profiles for both sites. For the Midland site, natural gas use predictably peaks during the winter months with increased heating demand. The baseload represents approximately half of the natural gas use at this site throughout the winter.

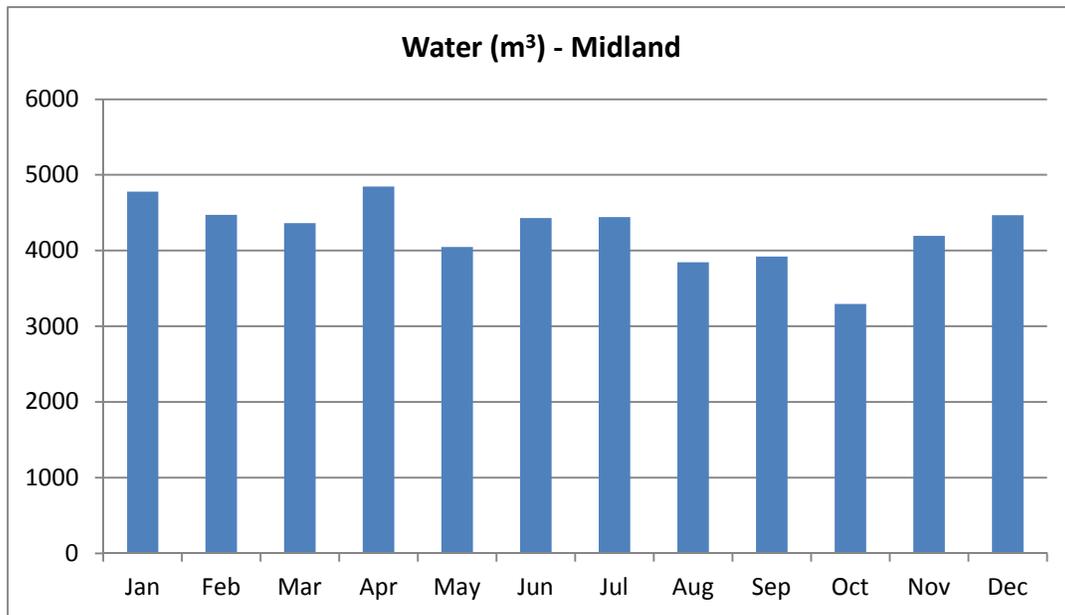


The Penetanguishene site follows roughly the same seasonal pattern as the Midland site, but with a very small baseload requiring very little natural gas use during the summer.

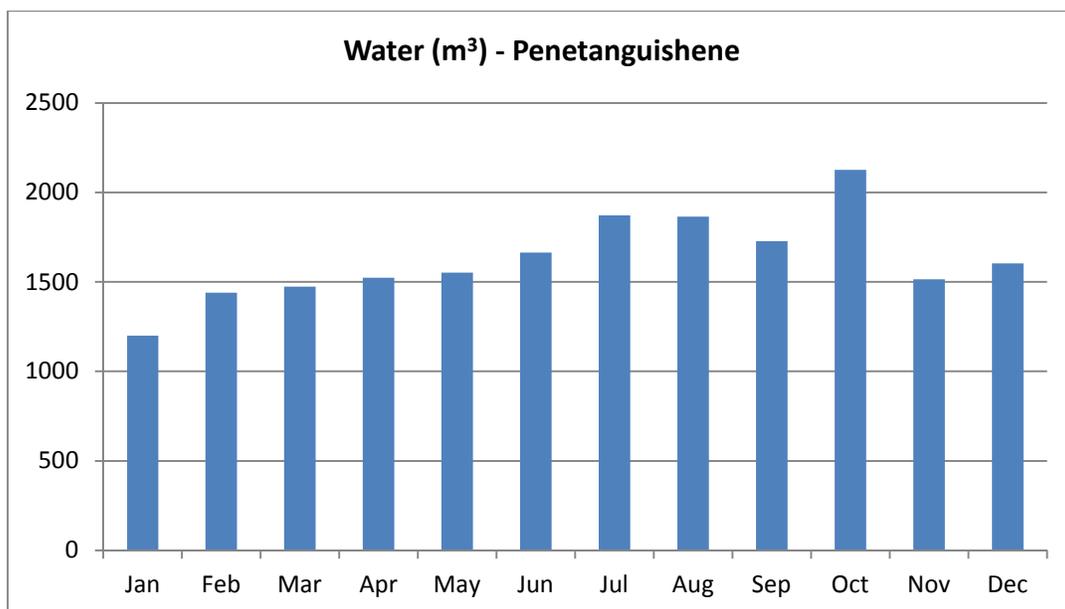


### Exhibit 4 - Monthly Water Consumption

Exhibit 4 shows the monthly water use profiles for both sites. For the Midland site, water use is relatively consistent throughout the year, with little seasonal variation.



For the Penetanguishene site, there is a 26% average increase in water use in the summer and early fall months (Jun-Oct) as compared to the rest of the year. This increase is attributable to cooling loads used in addition to the baseload.



## **CEO'S LETTER OF COMMITMENT**

Energy is an integral part of Georgian Bay General Hospital's operations, financial sustainability, and environmental stewardship. As a leader in moving our community forward toward greater overall health, it is critical to our mission that our facilities model an efficient, effective environment of care. To this end, Georgian Bay General Hospital resolves to pursue the guiding principles of strategic energy management.

In our Strategic Energy Management Plan, we define these principles and lay out our pathway to their realization through specific goals and practices. This plan will directly support Georgian Bay General Hospital's mission and play a key role in ensuring that our operations are a model of efficiency and progressive improvement.

Signed:

## KEY CONTACTS

### Executive Team

Karen McGrath  
*Chief Executive Officer*

John Kurvink  
*Vice President, Corporate Services & Chief Financial Officer*

### Facilities Department

Dwayne Payne  
*Manager, Facilities and Operations*

### Green Team

Stephanie Patenaude  
*Chair, Green Team*

### Purchasing Department

Corinne Ayres  
*Manager, Purchasing*

## Appendix – 2013 Energy Use & Savings Projections

### Georgian Bay General Hospital - Midland Site 1112 St. Andrews Drive Total Site Savings Jan-Dec 2013

Utility	Unit	Base-Year Equivalent		Actual		Savings			
		Use	Cost	Use	Cost	Use	%	Cost	%
Electricity	kWh	3,903,068	412,829	3,715,861	393,119	187,207	4.8	19,710	4.8
Natural Gas	m <sup>3</sup>	1,143,974	257,611	770,111	174,423	373,863	32.7	83,188	32.3
Water	m <sup>3</sup>	95,214	254,539	66,137	179,811	29,077	30.5	74,727	29.4
<b>Total Energy</b>	GJ	56,678		42,074		14,604	25.8		
<b>Total Cost</b>	\$		\$978,932		\$795,819			183,113	18.7

Base-Year: Jan-Dec 2010

Utility Rates: current as of May 1, 2013

Source: Blackthorn Management, Inc.