

STRATEGIC ENERGY MANAGEMENT PLAN FOR ST. THOMAS ELGIN GENERAL HOSPITAL 2015



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About STEGH

The St. Thomas Elgin General Hospital (STEGH) is a 166-bed, 440,000 square foot facility providing comprehensive 24-hour coverage in Internal Medicine, Surgery, Obstetrics, Pediatrics, Anesthesia, Emergency and Family Medicine. As a fully accredited hospital, we are proud to serve the city of St Thomas and all eight municipalities within the County of Elgin.

More than 800 individuals work at STEGH, including over 200 credentialed Professional Staff (physicians, dentists and midwives) who provide in-hospital care ensuring that we provide an excellent patient experience to each patient that walks through our doors.

Our range of hospital services include, emergency medicine, a surgical program, cardio respiratory services, sleep studies, palliative care, chemotherapy, diagnostic imaging, education programs, pediatrics, obstetrics, and much more.

Introduction

Beginning in 2014, as per Ontario Regulation 397/11, all broader public sector organizations will publicly report their annual energy use and greenhouse gas (GHG) emissions. This regulation impacts hospitals, municipalities, universities, colleges, school boards and municipal service boards. Organizations will develop and implement a five-year energy conservation and demand management plan. STEGH is committed to developing an Energy Management Plan by establishing a baseline, setting goals, identifying conservation potential, and evaluating results. STEGH's overall goal is to promote stewardship of our environment, management of our resources and reduce energy use.

Energy Management goals are aligned with STEGH's core values of:

Compassion

- *Qualities include: empathy and sympathy; Active listening (being present and engaged; creating understanding); Advocating for needs of others; Non-judgmental; Focus on relationships; Offer assistance; Nurturing preferred behaviours.*

Energy Management will improve financial commitment to direct patient care by reducing energy costs and improve air quality by reducing greenhouse gas emissions.

Accountability

- *Qualities include: Honestly and truth telling; Taking ownership; Participating; Being professional; transparency; Ability to reflect on mistakes and learn from them; Questioning the 'status quo'; Using evidence and facts; Ensuring clarity of communication; Role-modeling desired behaviours.*

Everyone at STEGH can contribute to energy reduction. Using electricity, gas and water wisely will reduce our consumption and will increase funds for patient care.

Respect

- *Qualities include: Equal treatment regardless of role; Acknowledgement and recognition; Patience; supporting Code of Conduct; Not 'talking down' to people; Resolving conflict directly and privately; Responsive to cultural/religious differences.*

Respect also includes managing our environment. All staff, physicians and volunteers can contribute by reducing energy use, promoting environmental stewardship through recycling, water conservation and waste reduction.

Excellence

- *Qualities include: Demonstrating commitment to outcomes; Using evidence-based decision making; Going above and beyond to meet and even exceed expectations; Learning and continuous improvement; Measuring and benchmarking outcomes; Respecting limitations; Seeking innovative solutions; Striving for simplicity.*

STEGH will enhance excellence by implementing environmental programs and improving overall environmental performance. Benchmark progress and recognize improvements.

Safety

- *Qualities include: Prevention; Protecting patients and self; Establishing a 'safety mindset'; Visible commitment; Recognition and enforcement of safe practices and behaviors; Safe culture to identify concerns; Finding and correcting the 'root cause' of errors; Benchmarking against Accreditation Canada safety standards.*

Utility and energy related costs are a significant part of overall operating costs. To further strengthen and obtain full value from energy management activities, a strategic approach will be taken with the organization integrating energy management into its business decision-making, policies, and operating procedures. Active management of energy related costs and risks in this manner will provide an economic return to the organization and will support other key organizational objectives.

STEGH has a long history of energy conservation. In March 2007, STEGH partnered with Honeywell to implement a comprehensive energy and facility renewal program which aimed at reducing electricity, natural gas and water use. This long-term energy retrofit project has reduced the organization's annual utility bills and reduced greenhouse gas emissions. STEGH also has a "Green Team" comprised of dedicated staff that is committed to environmental stewardship and energy efficiency initiatives. The team encourages environmental programs in the workplace with the goal of implementing energy and utility reduction strategies, improving waste management, reducing greenhouse gas emissions and improving overall environmental performance. The Green Team and STEGH's commitment to an Energy Management Plan is supported by STEGH's Executive Leadership Team and Board of Governors. Employee engagement is critical to STEGH's sustainability program. Annually, the Green Team will organize a series of staff events to promote the importance of our environmental program, educate, and engage staff in advancing our stewardship agenda.

STEGH believes there is a connection between healthy patients and staff and a healthy environment and encourages all staff, volunteers and physicians to become environmental stewards in their workplace and communities. All benefits contribute to exceptional patient experience each time.

Energy Management Vision

The St. Thomas Elgin General Hospital's vision is "To deliver an excellent patient care experience, in a safe and compassionate environment, in collaboration with our healthcare partners".

Therefore, we consider our facility a primary source of giving care and an integral part of the healing environment. Key to this equation is the ability to use our facilities efficiently and effectively. This results in STEGH being able to direct more resources toward patient care and the relief of illness and suffering. By reducing our environmental footprint, we are creating a healthier environment.

Guiding Principles for Strategic Energy Management

STEGH's energy management plan will be guided by the following principles:

Taking A Strategic Approach: While STEGH 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 daily decision-making, policies, and operating procedures will help ensure substantial and long lasting reductions in energy use.

Supporting Critical Goals: Strategic energy management will directly support critical goals of caring for the environment. It also assists to optimize the healing and working environment; improve the hospital's financial resources by reducing energy and utility costs; and optimizes the capacity of existing energy systems to meet current and expanding operational needs. The impact of energy management efforts will be tracked and reported wherever possible.

Pursuing Long-Term Change to Core Business Practices: The value of a strategic approach is the consistent incorporation of energy and utility management into our organization's business practices and decision making, such as the strategic planning and purchasing processes.

Change in energy-related business practice will cover all applications of energy management – new construction and major renovations, existing facility operations and upgrades, and economic analysis and procurement practices.

Fostering Organizational Commitment and Involvement: Executive and organizational commitment and involvement is critical to successful strategic energy management. Management will ensure that adequate organizational support and resources are available to maximize the benefits of energy and utility management.

Obtaining Solid Economic Returns: Energy management investments will be carefully investigated and produce solid economic returns that meet expectations. Consistent financial analysis will consider life cycle costs that reduce total cost of facility operation.

Using Available Resources and Assistance: STEGH will use national, regional, and local sources of strategic, technical, and financial assistance to help achieve energy management goals. These include programs through the Ontario Power Authority, ENERGYSTAR, Canadian Coalition for Green Health Care, and The Canadian Healthcare Engineering Society.

Strategic Energy Management

Strengthened Awareness, Communication and Environmental Stewardship

Energy management is a visible, public commitment to the community and environment.

Through aggressive energy management, STEGH can provide leadership in promoting sustainable efficient business practices, and environmental stewardship. The benefits of a strong communication and staff awareness program will reap long-term benefits. Cultural/behavioral change evolves over time and is carried over from the work site to the home. Ultimately, staff awareness programs increase understanding and awareness of our personal energy usage and lead to improved personal efforts to use energy wisely. STEGH will provide a forum to promote and support staff participation through the STEGH Green Team initiatives, encourage open communications and solicit feedback.

Enhanced Healing and Working Environment

In existing facilities, efficient operating practices improve patient as well as employee comfort with stable air temperature, better indoor air quality, and lighting. Energy use in healthcare facilities is climbing due to a standard of care that relies on high-energy consumption technologies. Infrastructure decisions regarding the physical building and replacement of equipment will consider the impact on energy consumption, sustainability and overall improvement for staff and patients. Building design and renovations will incorporate STEGH's energy objectives.

Improved Financial Health and Operating Cost Reduction

Strategic energy management presents a highly leveraged opportunity to reduce operating costs and positively impact STEGH's operating costs. The annual updating of our Strategic Energy Management Plan will provide information to everyone about how we are performing year over year. Energy conservation initiatives will be featured in our internal communication strategies. STEGH will also participate in utility incentives where possible.

Baseline Energy Use & Cost

STEGH Energy Costs for Years 2011, 2012, 2013 and 2014				
Year	Electricity	Natural Gas	Water	Total Cost
2011	\$ 787,861	\$ 441,976	\$ 95,962	\$ 1,325,799
2012	\$ 690,115	\$ 295,187	\$100,360	\$ 1,085,662
2013	\$ 735,326	\$ 309,504	\$103,333	\$ 1,148,163
2014	\$796,346	\$ 317,512	\$102,559	\$1,216,417

Key Observations:

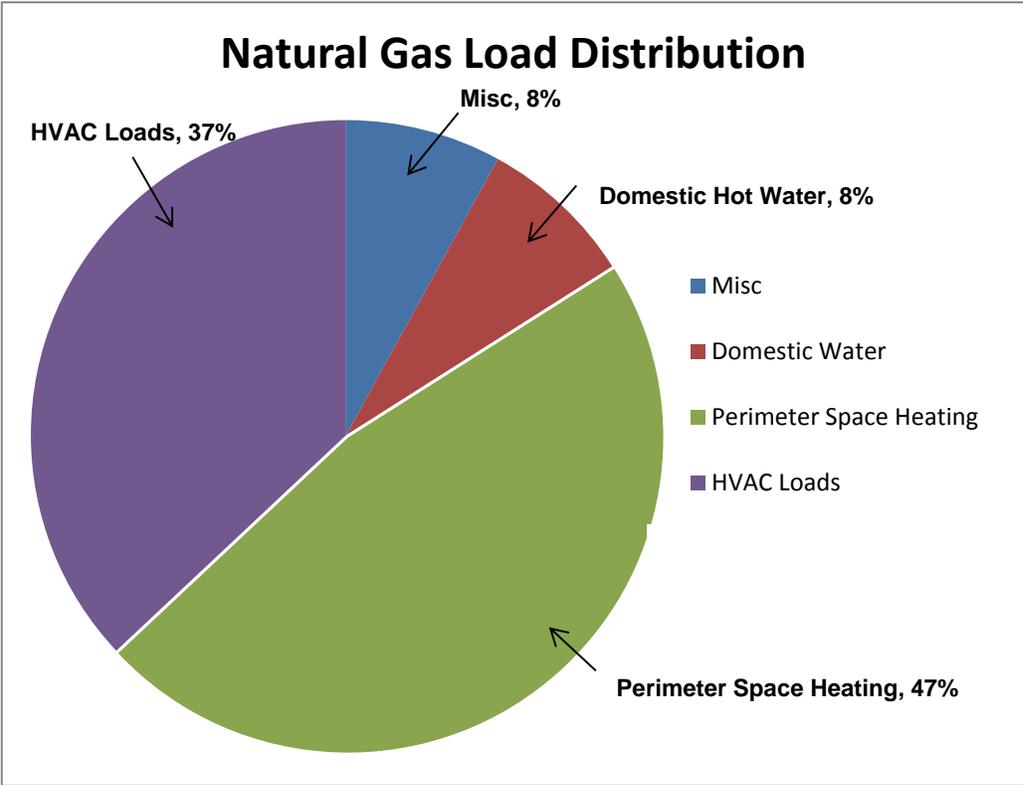
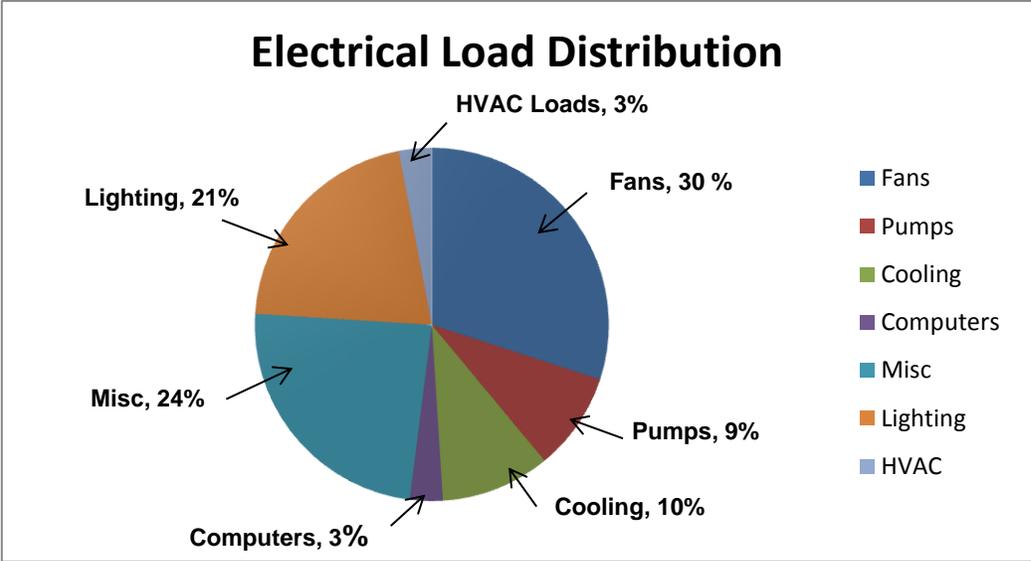
A review of the baseline energy cost profile reveals that the total annual utility costs for STEGH in 2013 was \$1,148,163 dollars. Electricity represents the largest cost at 64% of total costs, natural gas at 27% total costs, and water at 9%.

STEGH Energy Consumption for Years 2011, 2012, 2013 and 2014			
Year	Electricity kW/h	Natural Gas	Water
2011	6,301,638 Kilowatt Hours	1,419,747 Cubic Meters	49,618 Cubic Meters
2012	6,564,569 Kilowatt Hours	1,342,376 Cubic Meters	60,163 Cubic Meters
2013	6,405,194 Kilowatt Hours	1,370,435 Cubic Meters	55,213 Cubic Meters
2014	6,704,381 Kilowatt Hours	1,550,405 Cubic Meters	52,361 Cubic Meters

Annual electrical consumption for 2014 is 6,704 MWh, and the annual gas consumption is 1,550,405m³, and reflecting an energy intensity index for 2013 of 50.44105 ekWh/sqft.

Current Load Distribution

ENERGY END USE BREAKDOWN



Energy Management Goals

- Implement financial practices and decision-making processes to achieve energy efficiency. Decisions about energy management investments will be part of STEGH's high-level, long-range process for budgeting for capital and operations.
- Establish purchasing specifications for energy efficient equipment and services. Use purchasing specifications that minimize life-cycle costs for energy efficient equipment and services. Consider Energy Star qualified products where possible.
- Standardize specifications for equipment that are routinely replaced (i.e., lights, motors, etc.)
- Initiation of purchasing policies that exclude substances with potential health risks such as PVC and mercury.
- Investigate the use of green cleaning products to reduce staff and patient exposure to harmful vapors and prevent damaging chemicals from entering the sewer system.
- Establish efficiency standards for design and construction and for building operations and maintenance services. Implement construction practices in all capital projects that specify early team collaboration, which will assist in the development of sustainable construction standards using durable, low-emitting materials and finishes. Set clear energy performance targets for new construction and renovations.
- Set and meet clear energy performance targets.
- Continue with annual savings guarantee of \$115,000 through the energy and facility renewal program with Honeywell.
- Document energy saving implementations and update annually in STEGH's strategic energy management plan.
- Improve building operating performance
- Implement cost effective facility upgrades where justified by life-cycle cost analysis
- Actively manage energy and utility commodities through group purchasing provider
- Monitor, track and reward progress
- Benchmark against other health care facilities to further investigate energy saving opportunities
- Implement an active and effective Green Team
- Introduce an effective awareness campaign.

2015 ENERGY SAVING INITIATIVES AT STEGH

Capital Projects 2015
Cooling Tower Replacement – April 2015
Generator Replacement – March 2015
Replace Aging Bulk Oxygen Tank – Summer 2014 ongoing
Sliding Door Replacement – February-August 2015
Masonry Repair Restoration – Year 2 of 5 year strategy - Fall 2014 ongoing
Hot Water Tank Replacement – January 2015
Replace aging kitchen AHU – Fall 2015
Replace aging AHU 1B (tower) –Fall 2015
Air Compressor for BAS replacement –summer 2015
Supplemental A/C unit for DI Ultrasound room –Fall 2015
Supplemental A/C unit for I.T.-Fall 2015

Detailed Monthly Consumption 2011, 2012, 2013, 2014

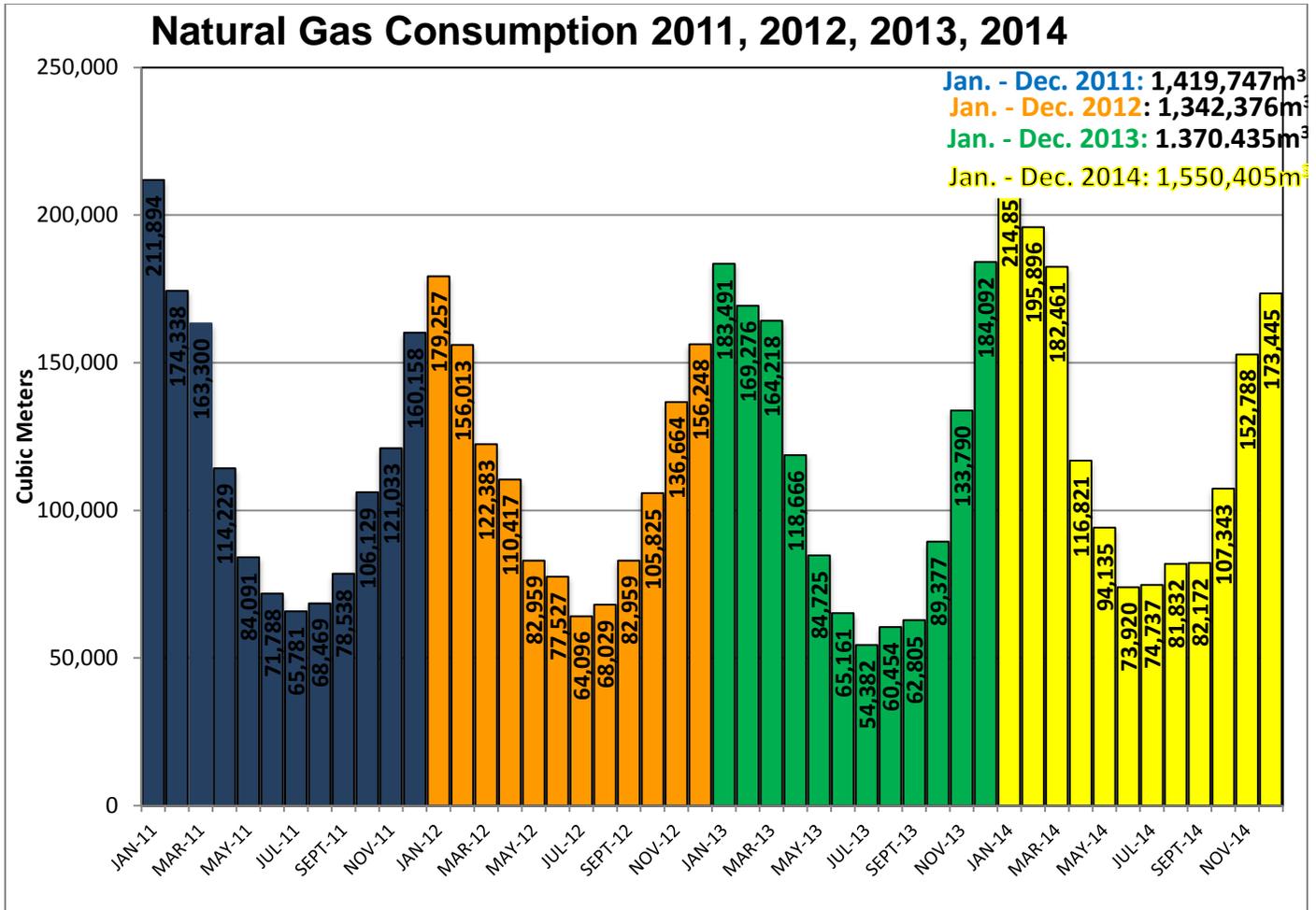


Exhibit 1 – Natural Gas Consumption by Month 2011, 2012, 2013, 2014

Natural Gas profile shows that winter increase corresponds with the heating demand.

Electricity Consumption 2011,2012,2013,2014

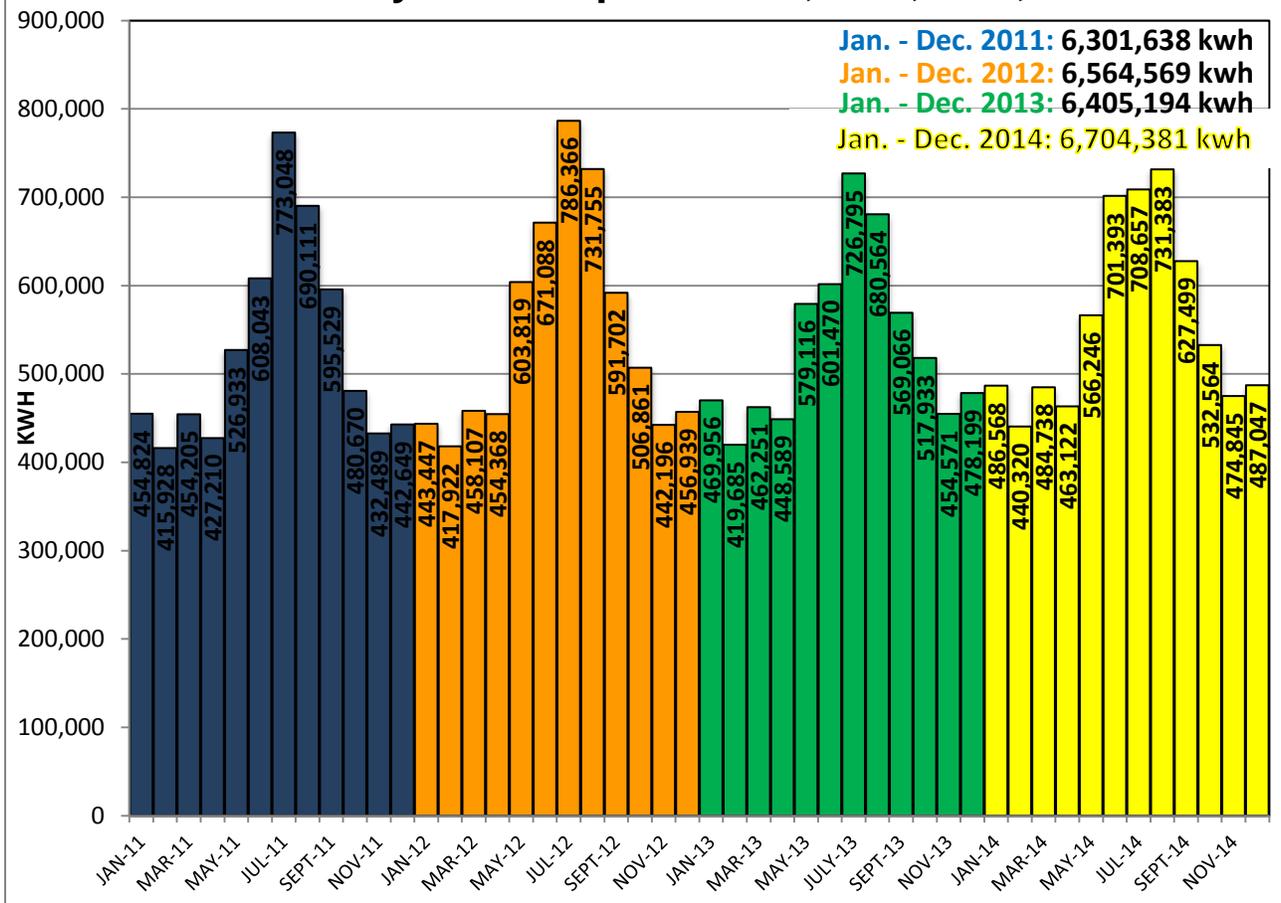


Exhibit 2 – Electricity Consumption by Month 2011, 2012, 2013, 2014

Electricity profile shows that summer increase corresponds with peak cooling demands.

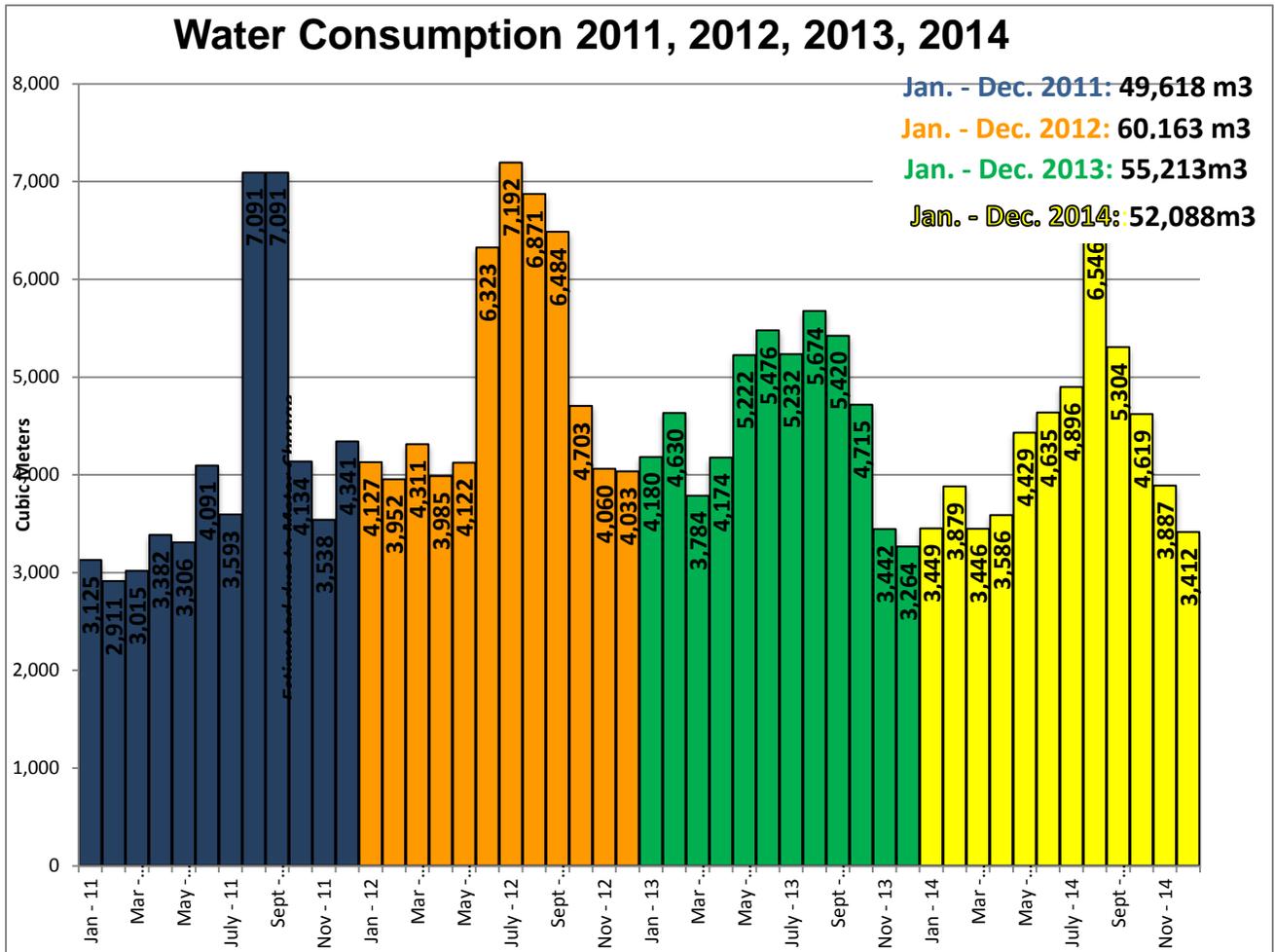


Exhibit 3 – Water Consumption by Month 2011, 2012, 2013, 2014

Water consumption profile shows that summer increase corresponds with peak cooling loads.

Energy Savings Opportunity Report Executive Summary

St. Thomas Elgin General Hospital retained Honeywell in 2007 to conduct a comprehensive energy and facility renewal program aimed at reducing electricity, natural gas and water use while upgrading a part of the hospital's infrastructure. The initial review by Honeywell, which evaluated opportunities for improving energy efficiency and facility renewal, determined that for an older hospital, STEGH was already doing a good job managing energy. Despite this achievement, STEGH wanted to further improve the quality of the facility and improve energy efficiency. This was accomplished through improvements to the lighting system, mechanical systems, control systems, water systems and building envelope.

STEGH collaborated with Honeywell to complete the improvements and the work was set-up under a guaranteed performance contract. This contract is still in place today with expected savings of \$115,000 annually. In total 33 measures were completed by 2009. Although STEGH began the project as an energy-efficient hospital, the management team realized there was still room for ongoing improvement. The hospital's staff members have implemented a committee focused on environmentally responsible working practices such as recycling.

A number of measures were implemented through the Honeywell agreement, which included:

- Lighting Measures
 - Complete conversion of existing T12 to T8
 - Replace exit lighting with new LED fixtures
 - Replace metric bed-light fixtures with standard T8 fixtures
 - Install LED exit signs
- Control System Measures
 - Optimize fan system operation
 - Adjust ventilation to match occupancy
 - Optimize controls for energy efficiency
 - Cycle perimeter heating water pumps to prevent trapped air (summer)
- Mechanical System Measures
 - Install zone dampers and VSD's to shut down zones and slow down AHU's during unoccupied periods
 - Install VSD on chiller, chilled water pumps and perimeter heating loop pumps
 - Replace Chiller
- Building Envelope Measures
 - Replace Door Seals and Sweeps
 - Caulk wall roof joints in mechanical rooms with steel deck roof
- Water Measures
 - Install laminar low-flow restrictors on washroom sinks
 - Retrofit tank toilets to low flow

Next steps include the development of a robust program that raises awareness, takes advantages of energy incentives, and maximizes savings.

The Green Energy Act

For more information on the Green Energy Act:

- [Regulation 397, the Green Energy Act](#)
- Additional information on the [Green Energy Act requirements for the broader public sector](#)

Energy Consumption and Greenhouse Gas Emissions Reporting 2014

January 1, 2014 - December 31, 2014

St. Thomas Elgin General Hospital

Operation Type	Total Floor Area	Hours Per Week	Electricity	Natural Gas	GHG Emissions (kg)	Energy Intensity (ekWh/sqft)
Facilities Used for Hospital Purpose	421,658 sq. ft.	168 hr.	6,405,194 Kwh Hours	1,370,435 Cubic Meter	3,100,580.60707 (kg)	50.44 (ekWh/sqft)