St. Thomas Elgin General Hospital

St Thomas Elgin General Hospital Energy Management Plan 2019

LONDON | 369 YORK ST, SUITE 2B | LONDON, ON N6B 3R4 | P:519-679-8660
OTTAWA | 250 CITY CENTRE AVE, SUITE 403 | OTTAWA, ON K1R 6K7 | P:613-241-0030
www.chorley.com

ABOUT STEGH

St. Thomas Elgin General Hospital (STEGH) is a 155-bed facility providing comprehensive 24-hour care including: Internal Medicine, Surgery, Obstetrics, Pediatrics, Anesthesia, Emergency and Family Medicine. As a fully accredited hospital, STEGH is proud to serve the city of St Thomas and all eight municipalities within the County of Elgin.

More than 800 professionals work at STEGH, including over 200 credentialed Professional Staff who provide in-hospital care. These professionals ensure that STEGH provides the highest quality of care to each patient.

STEGH services include emergency medicine, a surgical program, cardio respiratory services, sleep studies, palliative care, chemotherapy, diagnostic imaging, education programs, pediatrics, obstetrics, and much more. The hospital participates in the Southwestern Ontario Medical Education Network as a community hospital training centre, for residents in OB/Gyn, Pediatrics, Emergency Medicine, Surgery, Family Medicine, Internal Medicine, Hospitalists, Anesthesiology, and Maxillofacial Surgery.

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. As part of this, organizations are required to 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 allow STEGH to reduced energy costs and improved air quality, through reducing greenhouse gas emissions, maintaining its commitment patient care.

Accountability

- *Qualities include: Honesty 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.*

The environment must also be respected. 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. Progress will be compared to industry benchmarks and improvements will be recognized.

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.

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 and behavioral change evolves over time and is carried over from the work site to the home. Ultimately, increasing staff understanding and awareness

of personal energy usage will result in cognizant energy use. 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.

GUIDING PRINCIPLES FOR STRATEGIC ENERGY MANAGEMENT

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 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 Independent Electricity Systems Operator (IESO), Canadian Coalition for Green Health Care, and The Canadian Healthcare Engineering Society.

ENERGY MANAGEMENT GOALS

The following represent the STEGH 2019 through 2024 energy management goals. In addition to building on goals carried forward from the previous energy management plan, new goals are set to further signify STEGH's commitment to a sustainable future.

- 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.
- Continue to 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. Select motors and lights with higher standard efficiencies than those presently installed.
- Actively replace fluorescent, compact fluorescent and incandescent lighting throughout the facility with LED.
- 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. Implementation will reduce the risk of damaging chemicals entering sanitary systems.
- Continue with annual savings guarantee of $115,000 through the energy and facility renewal program with Honeywell.
- Document energy savings initiatives and measure the impact of implemented projects. Improve building operating performance through strategic project development with a focus on cost and energy management.
- Implement cost effective facility upgrades where justified by life-cycle cost analysis.
- Actively manage energy and utility commodities through group purchasing provider.
- Benchmark against other health care facilities to further investigate energy saving opportunities.
- Implement an active and effective Green Team.
- Introduce an effective awareness campaign.

STEGH 2016 to 2019 OVERVIEW

The following table presents the electricity and natural gas usage information from 2016 through to 2019. Based on the 2016 Energy use and greenhouse gas emissions for the Broader Public Sector, STEGH is 163 in electrical energy intensity (eWh/sqft) and 228 for Green House Gas (GHG) emissions (kg) when compared to its industry peers. Within the sample are 294 facilities. In 2016 STEGH energy intensity was 14.95eWh/sqft and total GHG emissions were 3,072,755kg. Industry maximums were 1096.40eWh/sqft and 38,425,400kg. 2016 values predate replacement of main boilers and occupancy of the Redevelopment. Due to the energy efficiency of the redevelopment and replacement of older infrastructure, these numbers are expected to fall in the 2019 report Broader Public Sector cycle. The following table lists STEGH electrical and gas usages from 206 to 2019.

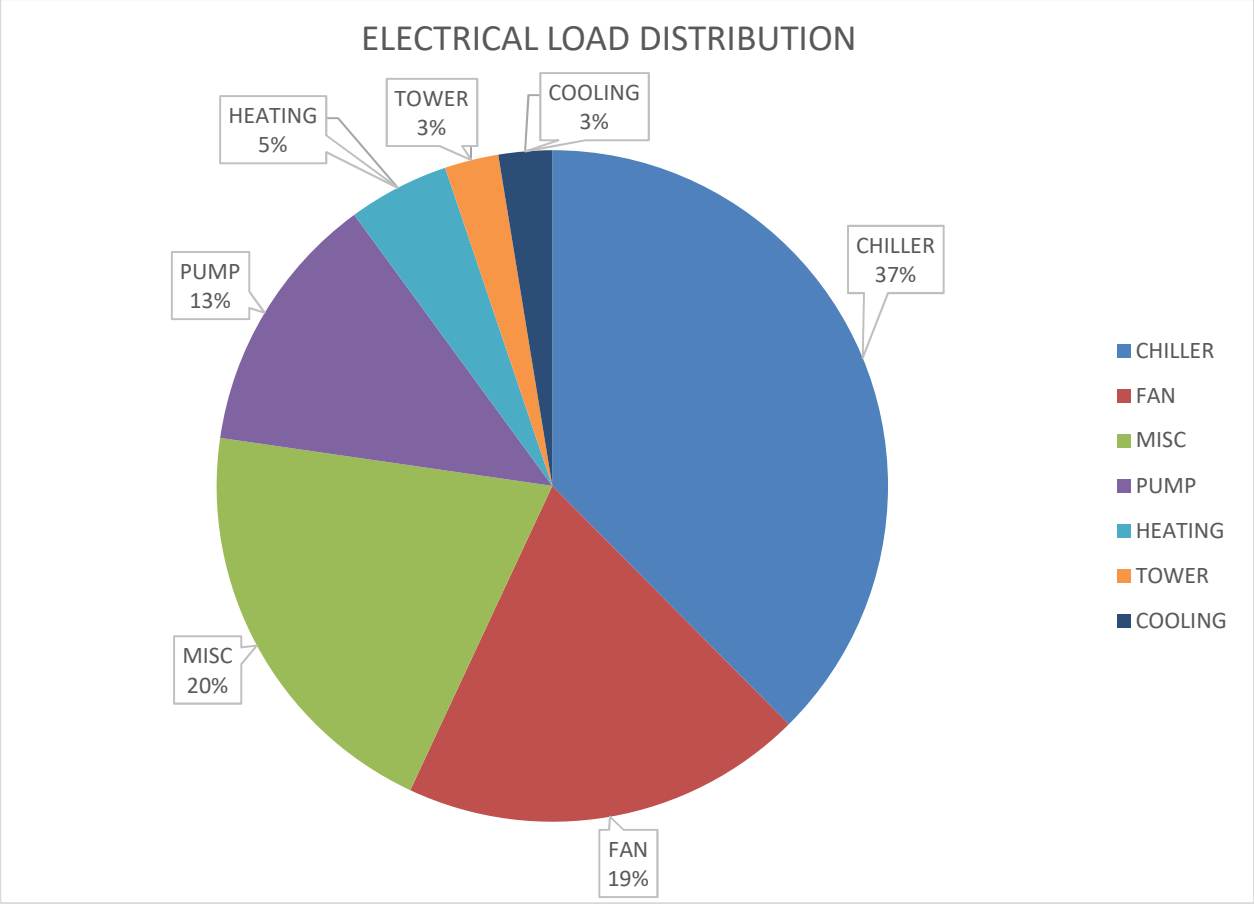
STEGH Energy Costs (2016 through 2019)		
Year	Electricity ($)	Natural Gas ($)
2016-17	1,083,379	300,956
2017-18	779,802	291,186
2018-19	942,139	36,515

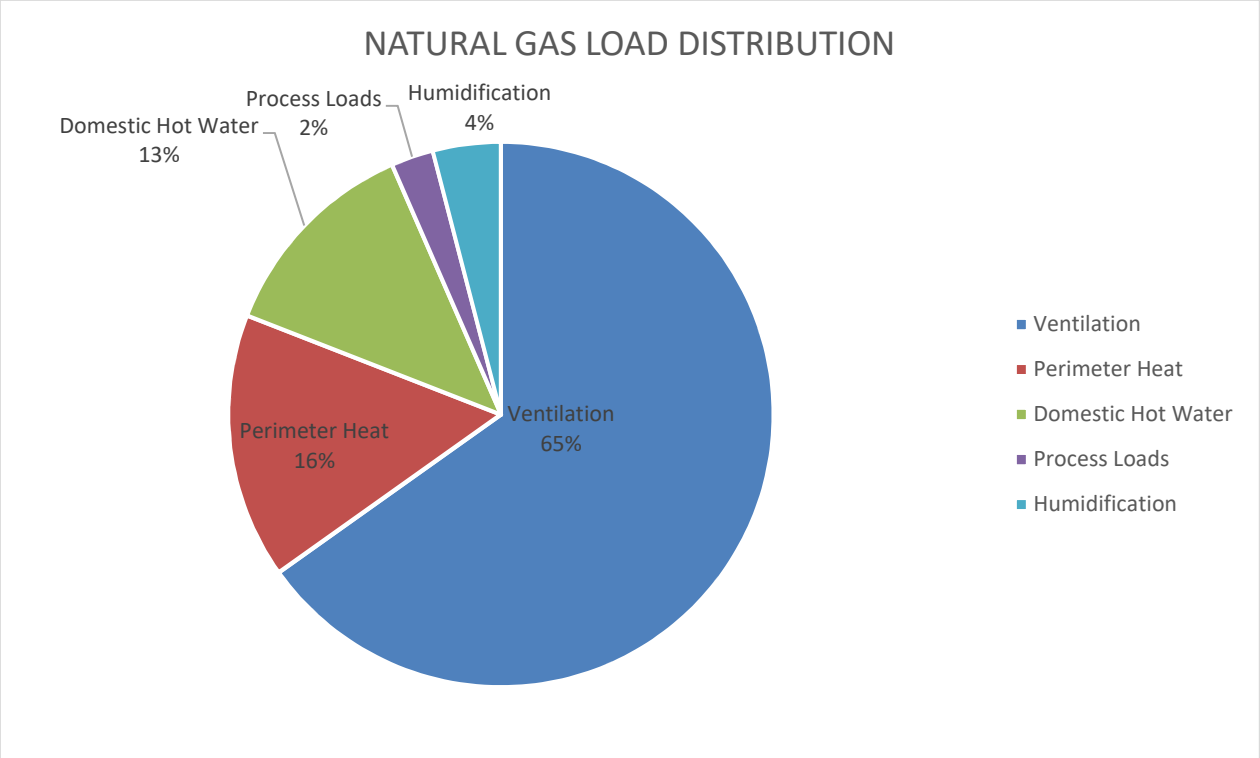
A review of the baseline energy cost profile reveals that the total annual utility costs for STEGH in 2017-2018 was $1,070,988. Electricity accounts for 73% of costs, and natural gas 27% of total costs.

STEGH Energy Consumption (2014 through 2019)			
Year	Electricity (kW/h)	Natural Gas (Cubic Metres)	Water (Cubic Metres)
2014-15	6,774,508	1,561,062	53,090
2015-16	7,070,427	1,361,383	58,647
2016-17	7,191,796	1,426,128	63,427
2017-18	8,610,623	1,685,004	61,122
2018-19	10,154,367	1,745,192	66,012

ENERGY END USE BREAKDOWN

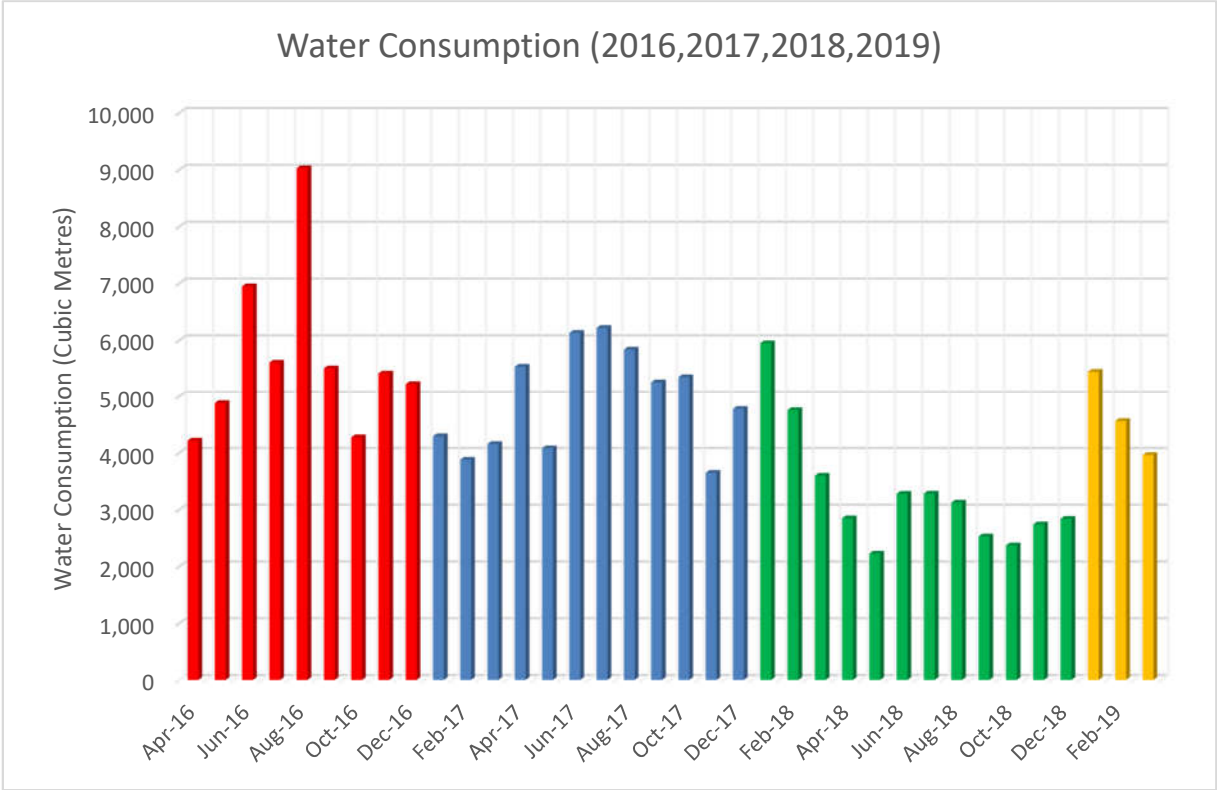
The following figures provide breakdowns of usage by load type for mechanical equipment. These ratios may be used to assist in targeting future energy reductions. An increase in efficiency of any system can be used to reduce its overall contribution to energy usage.





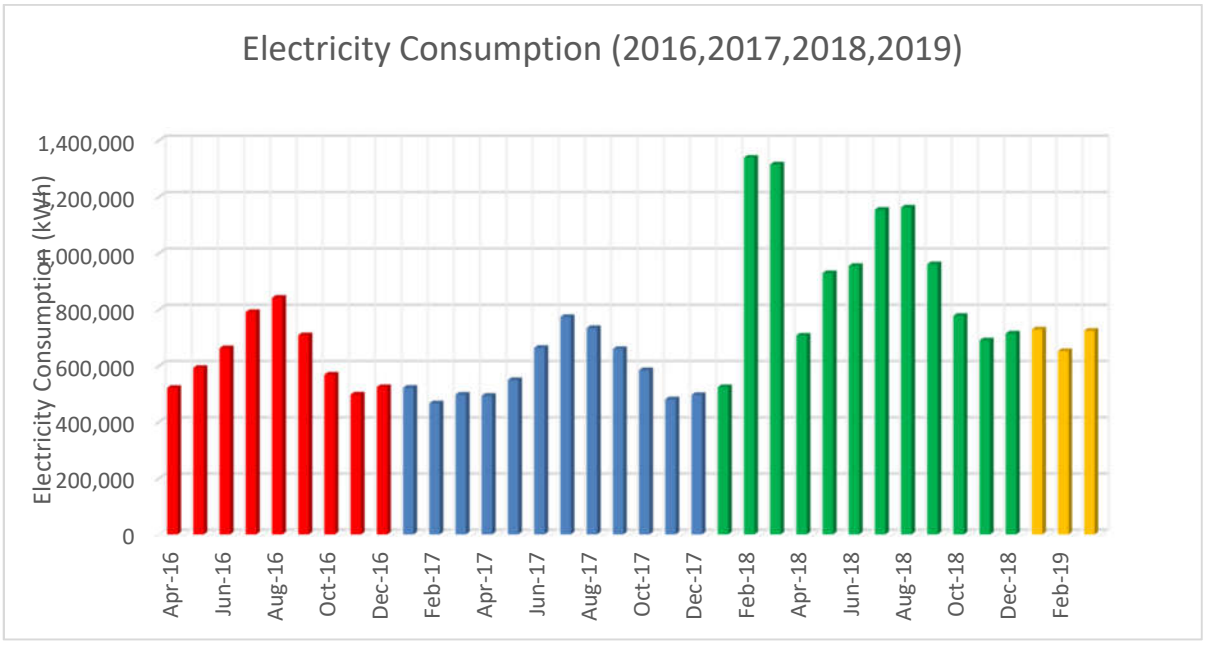
DETAILED MONTHLY CONSUMPTION

Similar to the mechanical load allocation charts above, the following figures provide breakdowns of monthly water, gas and electricity usage. These breakdowns may be used to help determine how usage can be managed.



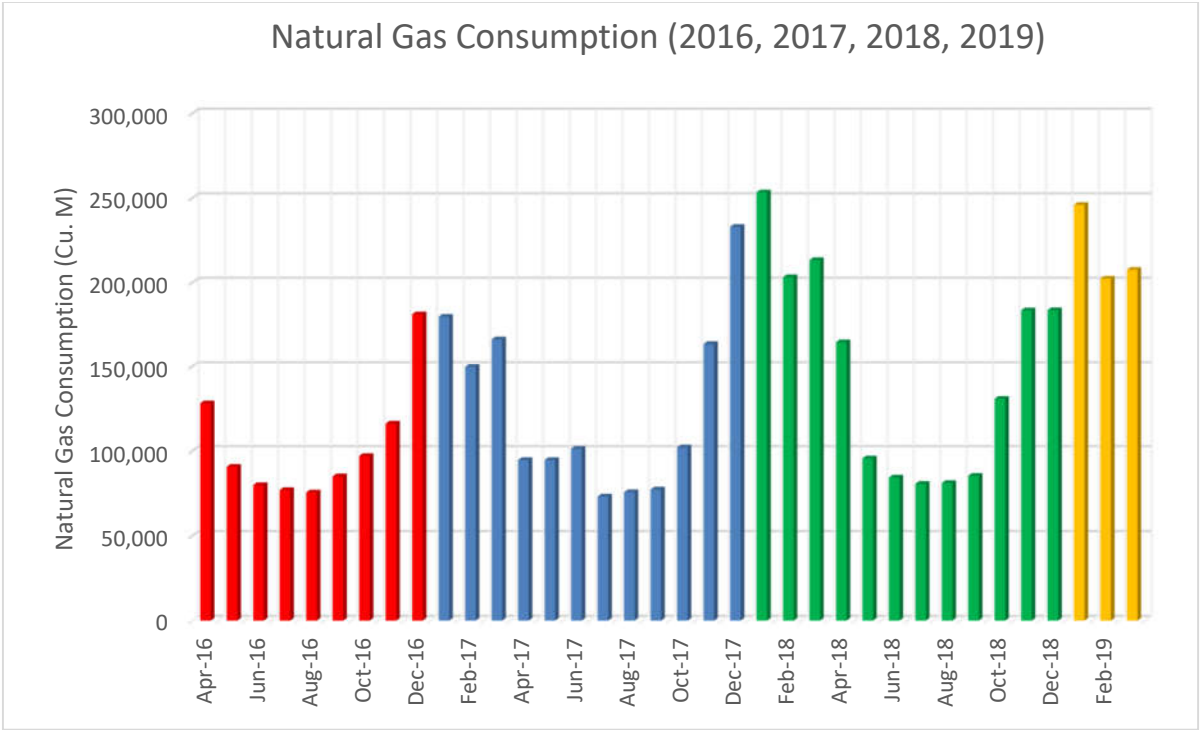
Key Observations:

Water consumption is at a peak during the summer, when the facility cooling loads also peak. This is due to increase makeup water consumption at the cooling towers.



Key Observations:

The electricity profile shows a summer peak each year. This is due to the large peak cooling demands during the summer, as all cooling equipment utilizes electricity to operate. The peak in February and March 2018 is an outlier.



Key Observations:

Natural gas consumption peaks during the winter when facility heating loads are highest. Summer gas loads are primarily due to domestic hot water production and air system reheat.

ENERGY SAVING INITIATIVES AT STEGH

Since development of the 2015 energy plan, the following projects have been implemented or are on-going. In addition to facility maintenance and infrastructure renewal, these projects were selected to improve the overall energy efficiency of the building operations.

Capital Projects - 2016-Present	Description
CCC Wing AHU Replacement - February 2019	Three older, inefficient air handling units were replaced with variable speed units. 
Domestic Water Heating System Upgrade - December 2018	The existing steam to domestic water heat exchangers were replaced for maintenance reasons. 

Capital Projects - 2016-Present	Description
Chiller Replacement - July 2018	A new higher efficiency chiller was installed to offload existing less efficient chillers currently installed within an older portion of the hospital. The associated cooling tower was taken offline. 
New Steam Boiler - May 2018	The existing central steam boilers were replaced with newer, high efficiency boilers.
Tower AHU Replacement - February 2017	The existing dual Tower AHU was old, inefficient and in need of replacement, and was replaced with a new, variable speed unit. 

STEGH FUTURE ENERGY MANAGEMENT INITIATIVES

The following projects and initiatives are part of the hospital's continuing energy plan, and explore opportunities to further reduce the facilities energy use, while exploring environmentally conscientious alternatives and opportunities.

Capital Projects 2019 to 2021	Description
Facility Auditing, Plant Optimization and Increased Boiler Plant Control	Electrical, gas and water metering will be improved throughout the facility. This information used in conjunction with a robust building automation system will allow changes to be made to building system operation. The result will be an optimized solution, wiser uses of resources and overall lower operating costs.
Lighting Control Program	Administration, service and applicable patient care areas within the older portions of the hospital will be fit with automatic lighting controls. These controls will be selected to reduce the overall all run times and reduce lighting levels when spaces are unoccupied. The result will be a reduction in energy costs, and lower maintenance costs.
Site Lighting Upgrades	Portions of the existing exterior lighting are still incandescent, High Pressure Sodium. Replacement of these remaining lights will reduce energy usage and provide savings from a reduction in relamping expenses.
Continued LED Lighting Replacements	A large portion of the hospital is illuminated by fluorescent lighting. These will be actively replaced with LED. Replacement of these lights will reduce energy usage and provide savings from a reduction in relamping expenses.
Electrical Vehicle Charging Stations	Installation of electric vehicle charging stations will convey to the community, STEGH's commitment to a sustainable future.
Energy Stat Management	STEGH will continue to support the ongoing Energy Star Program, actively looking for ways to reduce energy usage and greenhouse gas emissions through the replacement and selection of equipment.