Strategic Energy Management Case Study

Gifford Medical Center

PROJECT OVERVIEW

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Gifford Health Care is a nationally recognized health care system that serves the rural communities in Central Vermont and the Upper Valley. It has a history that spans 119 years when local physician Dr. John Gifford set out to establish a hospital in his home town of Randolph, Vermont in 1903. Since its humble beginnings, the hospital has grown in size and reputation. In 1977, Gifford Medical Center opened New England's first hospital-based birthing center, and between 1989 and 1994, it became one of the first hospitals in the country to offer primary care practices in rural areas. Over time, Gifford Health Care has expanded its offerings to include state-of-the-art services like critical care, women's health, a birthing



center, surgical services, adult day care, nursing home, independent living, and primary care. The healthcare providers employs 600 people across the state.

Since hospitals are critically important infrastructure that needs to operate around the clock¹, they are known for their high energy usage. Gifford is acutely aware of its energy usage and sought out the opportunity to reduce costs while also creating a healthier environment.

The heartbeat of Gifford is its critical care hospital, Gifford Medical Center. It is headquartered in Randolph with eight clinics throughout central Vermont and a nursing home and independent living facility at the Randolph Center campus. This case study focuses on Gifford Medical Center, which occupies a floor area of 130,339 square feet and in 2020, consumed a whopping 2,362,652 kWh of electricity.



Energy Management at Gifford Medical Center

Gifford Medical Center has a long history of environmental and conservation stewardship. In 2006, the organization began buying produce from local farms. In 2012, Gifford partnered with Efficiency Vermont, who benchmarked the hospital and deemed it the most efficient hospital in the state. Eager to do more, the organization set its sights on EPA ENERGY STAR Certification, the most recognizable energy label in the country. For a building to be ENERGY STAR certified it must undergo an audit and receive a score above 75 which indicates performance greater than 75 percent of other similar building types. In 2015, Gifford Medical Center became certified with a score of 81.²



The healthcare organization has had a long relationship with Efficiency Vermont, who approached Gifford in 2018 about joining its year-long Strategic Energy Management Program (SEM). This cohort program offered Gifford the chance to rethink its approach to energy management, build organization-wide support for energy efficiency, and achieve long term savings. In this model, Gifford was part of a cohort of peer organizations that formed a supportive community for collaborating and sharing SEM best practices. Gifford's cohort included a total of nine Vermont hospitals.

"We're making a real difference and our employees are engaged. Being more energy efficient not only helps us achieve our financial goals, but also decreases our carbon footprint and contributes to improved air quality in Vermont." - Gifford Director of Facilities Patrick Giordano³

SEM Partners

Efficiency Vermont operates an SEM program that aims to cut energy consumption by 10-15 percent in the first three years and 25-35 percent in the first six.⁴ The program is called Continuous Energy Improvement (CEI), which is another common term used to describe SEM principles and programs. To determine savings, actual energy consumption is compared to an estimate of energy consumption had SEM not been implemented. The Vermont Continuous Energy improvement program combines low-cost improvements with larger investments and employee education to achieve these savings. More specifically there are four basic steps:⁵

- 1. Process improvements in the office and on the manufacturing floor;
- 2. Regular maintenance of equipment;
- 3. Employee engagement to foster best practices in energy saving; and
- 4. Capital upgrades for equipment that is out-of-date or reaching end of life.

²https://giffordhealthcare.org/about-us/history/

³ https://giffordhealthcare.org/energy-efficiency/

⁴https://www.efficiencyvermont.com/services/project-support/strategic-energy-management ⁵https://www.efficiencyvermont.com/services/project-support/strategic-energy-management

Implementation

Gifford embraces all four of Efficiency Vermont's Continuous Energy Improvement steps. Efficiency measures are focused on the critical care hospital in Randolph, but employee engagement and best practices are companywide. Gifford participated in cohort trainings to educate staff on energy efficiency and encourage employees to shift their mindset from service to efficiency. Faculty and staff at all levels learned how to rethink equipment and to use programming to optimize systems for maximum efficiency. The marketing department engaged all employees through the CEO newsletter containing energy and conservation highlights from the Energy Committee, and communication boards at hightraffic locations. Best practices were shared with other Vermont hospitals through workshops, walkthroughs and networking events. In September, 2018 Gifford gave the cohort a behind-the-scenes tour of its facility and energy operations.



Gifford worked with experts at Efficiency Vermont to identify opportunities for energy saving capital upgrades

and process improvements. For example, along with a mechanical contractor, a steam trap survey was completed to evaluate the performance of the system with estimated savings of nearly \$10,000.⁶ A big lighting project converted all of the lights to LED and connected them together with a back-net control system that allows for advanced monitoring.

Cooling the facility represents a large portion of the hospital's energy usage. Through the CEI process, Gifford identified the opportunity to retro-commission its water chillers. With an incentive



from Efficiency Vermont, Gifford signed up for the five-step Existing Building Commissioning Program (EBCx), which identified four opportunities. Gifford opted to move forward with three that had short returns-on-investments including: chilled water supply temperature reset, chilled water loop differential pressure reset and improving the 90ton chiller staging. During the site evaluation for the retro-commissioning project, experts identified a new opportunity to save on heating costs, which led to added insulation on steam pipes in the mechanical room which saved 11,700 gallons of fuel oil.

SEM Savings and Tracking

Gifford uses Energy Star Portfolio Manager to track progress on energy efficiency and receives assistance from Efficiency Vermont to calculate savings and return on investment for projects. The facility has two other methods for tracking energy usage and savings – a back-net control system to track electricity usage of the new lighting systems, and a Direct Digital Controls (DDC) software system that actively monitors equipment to ensure it is running at peak performance.

Among the improvements implemented was a new boiler, with estimated first year savings of \$6,684, and a steam trap evaluation, with estimated first year savings of \$9,586.⁷ According to a case study by Efficiency Vermont, The 2018 retro commissioning of the chilled water system created opportunities for sustained annual electric savings of 42,000 kWh, about \$5,600 in bill savings, and insulating the steam pipes yielded an extra 11,700 gallons of annual fuel oil savings.⁸ All in all, Efficiency Vermont estimated that progress made in 2018, the year Gifford participated in the CEI program, resulted in \$52,951 of annual savings. Between 2015 and 2020 Gifford Medical Center has reduced its annual electricity consumption by approximately 700 MWh.



Conclusion

Registration

SEM has proven to be incredibly valuable for Gifford Medical Center. Employees of the organization are engaged and excited about their improvement, and the facilities managers see the results of savings in the data. The improvements create a healthier environment and allow the hospital to spend the savings on their facility and clients.

Gifford has a few exciting projects planned for the near future. Work just began on a retrocommissioning process for several air handling units at the critical care hospital to ensure optimal

⁷https://giffordhealthcare.org/energy-efficiency/

^shttps://www.efficiencyvermont.com/blog/your-story/4-hvac-controls-case-studies-that-prove-your-building-cansave-energy?utm_medium=email&utm_campaign=Efficiency%20Connections%20-%20Summer%202021&utm_ content=Efficiency%20Connections%20-%20Summer%202021+CID_59e6b51b9433b8dbaabeab59c1c04820&utm_ source=Campaign%20Monitor efficient operations. This project will coincide with a push to install Direct Digital control software at more locations and to leverage the DDC to better operate old equipment.

Another near-term project will integrate lighting and the HVAC system. The LED lighting controls system will be used to monitor spaces for occupancy so that energy is not wasted on areas that are unoccupied. Lights in rooms that are not in use will automatically turn off and heating and cooling systems will operate at a lower "non-occupied" mode.

The healthcare organization has a five-year energy saving plan to sustain savings and ensure continued improvement of building performance. The plan contains projects such as replacing rooftop units, chillers, heating systems, and other equipment such as improved lighting and HVAC controls. Gifford plans to get re-evaluated for an ENERGY STAR Score to account for the work done over the past six years.