

Promedica USING COMBINED HEAT AND POWER SYSTEM FOR ENERGY SAVINGS

Summary

- With a continuous need for electricity and heat, hospitals benefit from the energy efficiency and reliability that combined heat and power systems provide.
- ProMedica Wildwood Orthopaedic and Spine Hospital installed and advanced combined heat and power system using two Capstone C65 micro-turbines®.
- With the system in its second year of continuous operation, ProMedica has achieved the energy and GHG reduction goals established during the feasibility and design process.

The Opportunity

As a mission-driven, community-based healthcare system, one of the ways ProMedica positively impacts the community is by reducing their energy consumption. The savings associated with energy conservation not only lowers operating cost, but also is re-invested into patient care and the communities that ProMedica supports.

Using 2011 as a benchmark, the health system set out with the goal to reduce energy consumption by 7% at hospitals and largest medical office buildings (MOBs). To this end, ProMedica enlisted energy consultants for benchmarking and to perform ASHRAE Level 2 energy audits. In addition to the energy consultation, ProMedica worked with a utility bill pay service to consolidate all utility bill payments. This consolidation ensured that late payments were avoided, and provided a consistent process for utility data collection. That data was then exported for analysis and input into ENERGY STAR Portfolio Manager for all sites.



C65 microturbinesCapstone C65 microturbines

Strategy Selected

An extensive team including leadership, facility managers, service vendors, automation control teams and an assortment of suppliers came together to create and implement the ongoing energy management plan. A number of solutions were selected for the overall energy management plan: LED lights are now installed consistently across the facility, variable frequency drives are being used, and electric motors have been replaced. Additionally, the system-wide Sustainability Council is working to promote individual behavior change (such as unplugging cell phone chargers).

Benefits of a Combined Heat and Power System

One critical aspect of the energy management plan was the decision to incorporate a combined heat and power system at ProMedica Wildwood Orthopaedic and Spine Hospital. The onsite power system uses natural gas to provide electricity and heat to the hospital. Benefits to the facility include a reduction in annual energy costs, greenhouse gas emissions and source energy use intensity. The compact size and low sound level of the Capstone micro-turbine system was a key consideration because it was housed in the upper floor mechanical room above patient care areas.

The hospital has around-the-clock access to the operation and performance of the system with a distributed generation control system. This web-based dashboard – accessible on mobile devices or computers – provides facility managers with realtime data so that daily energy consumption can be monitored and balanced with the hospital’s needs and the system’s energy production. This increases savings by providing a baseload of electricity and heat generated by the combined heat and power system.

Measuring Success

Key performance indicators are prepared monthly and communicated to the ProMedica leadership team on energy intensity, cost avoidance and progress of energy conservation measures for all target facilities. This information is then used to make informative future decisions – such as putting combined heat and power systems in other facilities.

Results

- Source energy use index has decreased over 18%.
- GHG reduction of 700 tons or the equivalent of 115 automobiles saved annually.
- Energy supply cost risk mitigated due to multi-fuel purchase options.

Community Benefits

- Reduced energy consumption equals increased investments into patient care.
- Decreased environmental impact improves the wellness of facilities and the community.



Installing the Capstone C65 microturbines

Challenges and Lessons Learned

Initially, there was reluctance by the maintenance staff about the use of the new technology, and, while leadership was very supportive of the concept of a combined heat and power system, capital improvements like these still compete with other needed capital items for patient care such as MRIs and other clinical equipment.

However, once peers from other ProMedica facilities toured the installation and the staff saw the enthusiasm by their colleagues, they realized what a great system they had. In fact, due to the successful energy reduction, cost avoidance, and the ability to meet electricity and hot water demands, ProMedica is now considering combined heat and power systems for retrofits at other existing hospitals as an alternative to replacing boilers.

Similar systems have been installed at over 200 hospitals nationally with some having emergency power capabilities to improve resiliency and provide redundancy during power outages.

Demographics

ProMedica Wildwood Orthopaedic and Spine Hospital (WOSH), a division of ProMedica Toledo Hospital, was built with patients in mind. The 70,000-square-foot facility is the region's only free-standing hospital devoted exclusively to caring for orthopaedic and spine patients. The entire hospital was designed to provide a state-of-the-art environment that is customized to treat and rehabilitate adults with bone, joint and spine disorders and injuries.

As ProMedica's first allelectronic hospital, WOSH features 36 private rooms with added amenities, including convenient room service; six integrated operating rooms; 24/7 in-house hospitalist care; pre-operative education sessions; a bloodless care program; pain management blocks and anesthesia rounding to aid post-op recovery; and inpatient physical therapy. The high quality of care provided at WOSH has been recognized by the 2014 Healthgrades Patient Safety Excellence Award™ and the Press Ganey Beacon of Excellence for Physician Engagement Award.