

Case Study: Leaner Energy Challenge – Energy Efficiency



Summary

Hackensack University Medical Center (HackensackUMC), a nonprofit teaching and research hospital located in Bergen County, New Jersey, is the largest provider of inpatient and outpatient services in the state.

HackensackUMC is committed to sustainability and doing no harm by providing a sustainable environment for patients, staff and community.

HackensackUMC recognized that there was an opportunity for energy conservation and to address an infrastructure that was outdated and inefficient.

The hospital partnered with PSE&G to make necessary energy efficient upgrades to decrease greenhouse gas emissions as well as costs.

Hackensack University Medical Center, Hackensack, New Jersey

The Problem

Hospitals are significant energy users as they operate 24/7. HackensackUMC was faced with outdated and inefficient infrastructure, which was in need of significant upgrades but at minimum capital investment. They needed a creative solution/partnership.

The Strategy Selected

HackensackUMC partnered with PSE&G, through the utility's Hospital Efficiency Program, to make necessary energy-efficiency upgrades via a two-phase project that included installation of three 1,500 T Chillers and LED lighting and replacing cooling towers, among other improvements. The PSE&G program provides upfront funding for the entire project, eliminating the need for upfront capital. The program includes a buy-down incentive for eligible energy-efficiency measures, coupled with the on-bill financing at a zero percent interest rate. After PSE&G program incentives, HackensackUMC will ultimately repay approximately 43 percent of the project cost over a period of 36 months. HackensackUMC leadership supported this initiative and saw it as a win-win, enabling the medical center to significantly reduce its carbon footprint as well as save money for years to come. The annual utility cost savings, when the full project is completed, is estimated to total \$1.06 million. The annual energy savings is estimated to total 4,218,984 kWh and 217,693 therms.

Implementation Process

The project was set out in two phases. Phase 1 was completed in 2013 and included:

- i. Installation of a 1,500 T chiller and related pump to replace antiquated equipment.
- ii. A facility-wide lighting retrofit of more than 9,600 lighting fixtures with efficient fluorescent lighting in the medical center and LED lighting in the parking garages.
- iii. Upgrades of the lighting controls, including the installation of more than 1,100 occupancy sensors.
- iv. Optimization for greater monitoring, control and efficiency of the natural gas boilers.

About Hackensack University Medical Center

HackensackUMC, a nonprofit teaching and research hospital located in Bergen County, NJ, is the largest provider of inpatient and outpatient services in the state. Founded in 1888 as the county's first hospital, it is the flagship hospital of Hackensack University Health Network, one of the largest health networks in the state comprised of more than 11,300 employees, 3,100 credentialed medical staff members and 1,697 hospital and nursing home beds.

The investment for Phase 1 totaled \$2.7 million, of which HackensackUMC is repaying 36 percent through the PSE&G program's on-bill repayment feature, at zero percent interest over a period of 36 months.

Currently, the medical center is working to complete Phase 2 by summer 2015. Phase 2 of the project includes:

- i. Upgrading the main chiller plant consisting of the installation of two additional 1,500 T chillers, as well as replacing cooling towers, pumps, header piping and controls.
- ii. Connecting the research building to the main chiller plant, thus eliminating the standalone rooftop air conditioning units.

The investment for Phase 2 of the project is estimated at \$7.5 million with HackensackUMC to repay 46 percent of the cost. Upon completion, the combined investment of Phase 1 and Phase 2 is estimated at \$10.2 million, of which HackensackUMC will repay approximately 43 percent of the total combined project cost through the PSE&G program's on-bill repayment feature at zero percent interest. PSE&G's program provides funding for the remaining amount.



PSE&G and Hackensack University Medical Center held a ribbon cutting for a new air conditioning chiller that is part of \$2.6 million in energy efficiency improvements happening at HackensackUMC through the PSE&G Hospital Efficiency program.

Pictured from left to right: Mike Savage, PSE&G; Allen Prinzi, HackensackUMC; John Nesbitt, HackensackUMC; Joe Forline, PSE&G; Robert C. Garrett, Hackensack University Health Network; Mark D. Sparta HackensackUMC; and Bill Wicker, PSE&G.

Benefits

The annual utility cost savings for the combined project is estimated at \$1.06 million.

- Phase 1: \$487,000 annual saving in operating costs.
- Phase 2: \$582,000 annual savings in operating costs.

The Team

Mark Sparta, EVP & Chief Population Health Officer, Hackensack University Health Network

Allen Prinzi, Director, Plant Operations, HackensackUMC

John Nesbitt, Supervisor, Plant Operations, HackensackUMC

Donald Ferrell, Director Design & Construction, HackensackUMC

Mike Savage, PSE&G, Customer Solutions, Energy Services

The annual energy savings is estimated at total 4,218,984 kWh and 217,693 therms.

- The savings is significant; sufficient electric savings (kWh) to power about 630 homes, and sufficient natural gas savings (therms) to heat about 230 homes.
- Phase 1: saves 1,388,817 kWh and 155,264 therms in energy annually.
- Phase 2: saves 2,830,167 kWh and 62,429 therms in energy annually.

Challenges and Lessons Learned

One of the main challenges for HackensackUMC was energy-efficiency measures. There were so many opportunities, but they had to choose which measures would fit the required PSE&G program payback parameters. Because of the number of ongoing energy-efficiency measure installations, they had to meet certain deadlines to ensure the PSE&G program incentives did not run out due to the program's popularity. Another key challenge was designing and implementing around the patients and staff so as to advance the energy-efficiency project seamlessly and silently in the background of hospital operations. Beyond identifying energy-efficiency opportunities, tremendous coordination was needed to implement heavy construction to critical systems while maintaining a safe, healing hospital environment 24/7.