

Case Study: University of Maryland Medical Center

UMMC: Shedding Light on Energy Savings

Rapid Payback Opportunity

Sage Energy Consulting led the University of Maryland Medical Center (UMMC) to find over \$29,000 in readily accessible savings and a project payback of less than two years, in just one area of the energy audit performed for the healthcare provider. The UMMC complex's chief engineer, John Baldwin, and former energy manager Bernard Milam reviewed information provided in a Sage Energy Preliminary Audit, and determined that the ROI inherent in lighting system improvements would be significant enough to warrant further study. Further analysis revealed that the effort and investment for implementation, which were both manageable and did not involve large capital expenditures, made sound economic and environmental sense.

Background

In 2010, Sage Energy uncovered an opportunity to partner with Maryland Hospitals for a Healthy Environment (MD H2E) to provide selected healthcare institutions with preliminary energy audits, using state funding that was available on a limited basis. The assessments were aimed at helping institutions identify measures that will improve both energy efficiency *and* their bottom lines, while reducing any negative impact on human health and the environment. The University of Maryland Medical Center was chosen to participate, based on a number of factors, including UMMC's leadership role in environmentally sound fiscal policies.

Findings

UMMC is well-operated and maintained, with the added advantage of a knowledgeable staff already committed to energy efficiency and long-term vision. But, as with most existing structures, building design issues and legacy equipment limited how much energy consumption could be reduced without capital investment.



Solutions

The initial audit performed by Sage Energy uncovered a number of energy conservation measures (ECMs) that were not already under consideration by UMMC -- in planning, design or construction phases. These included:

- Cogeneration as a steam pressure reduction technique, and a source of "renewable kilowatts,"
- variable speed drives to improve chiller efficiency, and
- air handler filter upgrades.

Sage Energy also suggested measures aimed at reducing energy consumption during periods of low or no occupancy, such as:

- modifications to lighting systems, and
- power controllers that reduce electrical consumption of vending machines, medical equipment and computers.

Sage Energy supported further investigation of ideas aimed at increasing energy efficiency that UMMC had begun to consider prior to retaining Sage Energy. These included:

- reusing waste condensate,
- upgrades to controls in the HVAC systems , and
- air change solutions in sensitive areas such as unoccupied operating rooms.

Lighting System Assessment

For UMMC's lighting systems, Sage Energy was asked to perform an in-depth assessment, which provided detailed plans for occupancy controls in mechanical rooms, support spaces, and patient corridors, as well as retrofits for existing lighting fixtures. Lighting was chosen because, on average, lighting contributes to approximately 16% of a hospital's annual electrical consumption.

UMMC has beautiful, glass roofed atriums, but had lights that were on 24/7, even when the sun was shining brightly. Taking advantage of the building's attributes, 352 lights were put on photo cell sensors, which detect the level of natural lighting in the atriums, and turn the lights on or off accordingly. Additionally, 420 occupancy sensors were installed, 92 fixtures were replaced with more efficient fixtures, and 52 fixtures were totally removed. Previously, there were 300 light bulbs on in a sub-basement, when only 10 people a day were going down there. Now, the area has only 40 light bulbs.



With implementation of these measures UMMC's energy bill could be reduced \$29,000 annually. A baseline of energy use has been developed and actual savings will be verified.

Results

The bottom line: While the implementation of solutions for the comprehensive energy efficiency project is still in progress, the energy-saving measures on the lighting systems have yielded immediate results for UMMC. Here's the math:

Estimated cost (including contracted labor and an allowance for design services, project management and rebate administration)	\$88,000
BGE rebate (50% of eligible costs)	\$38,500
Net out-of-pocket cost	\$49,500
Payback	1.7 years

Sage Energy worked with UMMC to identify utility and state rebates to help lower the capital investment for the project and improve the payback. Maryland Energy Administration (MEA) grants and loans were also available to lower the out-of-pocket costs further; and Sage Energy is working with UMMC to guide them through this process.

Through their efforts, Sage Energy helped the UMMC project team educate the green team, facilities department, operations and maintenance department, and nursing leadership on the new changes, explaining the logistics, technical aspects, as well as the positive impact on human health that results from reduced energy usage.

"There are always three considerations in the pursuit of energy savings: what are the energy efficiencies to be gained; what is the environmental impact; and how do we pay for them? Sage Energy's connections to state funding sources and their knowledge of utility rebate programs were an invaluable resource when it came time to discuss project financing." - John Baldwin, Chief Engineer.