McHenry County, IL

Maximizing energy efficiency via performance contracting

Balancing growth with energy efficiency
McHenry County is one of the ten largest counties in Illinois. The County government is operated out of Woodstock, IL, in 19 buildings, totaling 706,944 square feet.

Client objectives
After additions and new building projects, the McHenry County building portfolio was growing, but the Facilities Management department's budget wasn't. As a result of outdated systems or ad hoc additions and renovations, many of the buildings in the County's portfolio were inefficient. By 2006, John Hadley, Director of Facilities Management, was ready to change that.

Half of the McHenry County Facilities Management budget is allocated for utilities. The County wanted to dramatically reduce this expenditure by increasing energy efficiency and optimizing the performance of building systems. As one of 28 departments competing for limited capital funds, the Facilities Management team and the County's purchasing department were interested in a low-risk financing vehicle that could expedite the projects. The work being performed would provide a better work environment for many of the County's 1,300 employees and demonstrate to the public the County's environmental commitment.

By partnering with an energy services company (ESCO) on a performance contract, the County could pay for building systems to be updated, retrofitted, replaced, or recommissioned via low-cost financing and the energy savings generated over a decade.

A request for proposal was issued in September 2006. After evaluating each company's proposal based on references, scope of work, and amount of guaranteed savings, two companies remained on the short list. After interviewing with the Director of Facilities Management John Hadley; Director of Purchasing Catherine Link, and the County Board; Siemens Industry, Inc., was selected.

While the County had targeted two projects to maximize energy efficiency, Siemens engineers performed an audit and identified additional energy conservation measures (ECMs) and the guaranteed savings resulting from their implementation. After evaluating the initial costs, payback, and predicted energy savings of the projects, the County chose the ECMs it would implement. The work would be completed as part of a $3.9 million three-phase, 10-year performance contract.

Siemens solutions

Phase I
When an addition to the County courthouse at the Government Center was completed in 1992, the result was two boiler rooms – one on the third floor of the jail, housing 1972 equipment, and another in the basement of the new addition. The County would gain tremendous efficiencies by replacing the inefficient single-pass boilers and cross-connecting the new high-efficiency boilers with those in the 1992 addition. "It was an engineering feat," says Hadley of the work Siemens engineers performed during Phase I of the contract. The cost for the project totaled $1.2 million.

Phase II
At an additional cost of $220,000, Phase II would replace inefficient T12 lamps with T8s at the Government Center, Administration Building, and Annex A, which is home to the County's Personal Health Service offices. The project had a quick payback, saving the County more than $20,000 annually.

Phase III
When Congress passed the American Reinvestment and Recovery Act (ARRA) in February 2009, McHenry County seized an opportunity to apply for federal grant money. Siemens assisted the County during the application process for the formula, an Energy Efficiency Conservation Block Grant (EECBG), funded on Nov. 11, 2009, the County received $2,475,900. The County Board authorized the Facilities Management Department to spend the entire amount on ECMs identified by Siemens in December of that year. Of the 38 projects noted, the County selected 16 to be completed as Phase III of the performance contract.

To slash the electricity costs associated with artificial lighting, Siemens would complete daylighting projects at the Administration Building, Government Center, and Annex A. Occupancy sensors would also be installed at these facilities to turn off lights in frequently unoccupied areas, such as public restrooms. Parking lots and garages, as well as building exteriors, were not exempt from Phase III lighting retrofits. The lights at the Administration Building parking lot and exterior wall sconces at the Government Center were converted to long-lasting, high-efficiency LEDs. Lighting fixtures in the parking garage at the Department of Transportation building were converted from mercury vapor lamps to T8 fluorescents.

A whole host of HVAC-related projects are planned and underway at the Government Center, including a DDC controls upgrade and implementation of demand control ventilation in the courtroom, in-row cooling in the IT server room, and upgrade to high-efficiency motors with variable frequency drives. Equipment and systems will also be retro-commissioned to optimize performance and increase efficiency. Additionally, an inefficient boiler will be replaced at Annex A.

To improve comfort and cut heating and cooling costs, window improvements are also underway. The addition of window film at Annex A will remedy cooling problems resulting from large solar exposures, reducing solar heat gain. And, at the Government Center's 1972 courthouse, a second pane of glass including new blinds, was installed inside the existing window frame creating an insulating air space.

All of these projects aim to cut energy use. One project on the docket, though, will generate it: the addition of 15-kilowatt photovoltaic (PV) system on the Administration Building. The system is scalable so the County can expand it as more state incentives become available and the cost of solar decreases. This project will showcase the County's commitment to clean energy.

The grant money was not given without specific stipulations – namely transparency. To communicate and educate the public on how the County was spending EECBG funding, Siemens sponsored a dedicated website to showcase what projects were being completed, their progress, and the environmental impact that would result.

Additionally, a green kiosk will be placed in the Administration Center. By interacting with the touchscreen display, visitors will learn about the County's environmental actions. The kiosk will:

- Provide photos of the EECBG projects and their energy savings
- Display the amount of renewable energy generated by the building's rooftop PV system
- Present the County's carbon footprint
- Serve as a building directory

Siemens isn't just the company that McHenry County contracted with; they are the County's energy partner. So when it came time to complete all the documentation required by the Department of Energy for the block grant, the ESCO helped with that, too. "Siemens has been very instrumental in partnering with us to get the paperwork completed in a timely manner," says Hadley.

And, when funding from another private company dried up for the County's environmental curriculum initiative, Siemens stepped in to aid the McHenry County Schools Environmental Education Program (MCSEEP). "I went to Siemens Corporate and wrote a grant application so that we could fund their program," says Becky Werra, Account Executive, Siemens. "We were able to give MCSEEP $22,000 to help sustain the program."

Client results
With many projects fully implemented, the County has already begun to see the impact. After the first year, the Phase I boiler project was already exceeding the energy savings that Siemens guaranteed under the contract. All unfinished projects are slated for completion by May 2011.

Despite the County's growth, the total energy savings will keep Hadley's Facilities Management budget flat. "Had we not utilized this vehicle, the Director of Finance would notice John coming to the table requesting budget increases," explains Link. "This has pretty much created a budget-neutral situation." The energy efficiencies from all projects combined over the contract's 10-year term is in excess of $1.4 million. Over 10 years:

- Phase I will save $324,640
- Phase II will save $210,990
- Phase III will save $940,000

The projects are doing more than just saving money, though. In addition to improving the work environment for many County employees and building operations for the Facilities Management team, they will have a profound impact on the County's carbon footprint. It is estimated that all the work being done under the performance contract will reduce CO_2 by more than 6 million pounds. Over the project term, NOx emissions will be reduced by more than 53,000 pounds and SO_2 will be cut by more than 200,000 pounds.

Even outside of McHenry County, people are taking note of what's happening there. The County is now being looked at as a visionary leader in project management and environmental stewardship. In April 2010, the County joined two other Illinois counties when it was awarded a triple-A bond rating from Moody's Investors Service.

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