SIEMENS

Marshall County Schools Energy Conservation Program

Siemens Made 11 Facilities Energy Efficient in Only Six Months.

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Sitting nearly 50 miles south of Nashville, Marshall County has a proud tradition of producing more state governors than any other county in Tennessee. It is comprised of four towns (Lewisburg, Chapel Hill, Cornersville and Petersburg), and has a population of 28,000. Like many areas of the U.S., the County has been affected by the weakened economy, with unemployment figures as high as 20% in 2010. Given its tradition of producing leaders, it made sense for Marshall County to maintain emphasis on its education system, even through rough times. The primary challenge for the County became cost effectively improving energy efficiency in ten schools and one administration building.

Client Objectives

In March 2009, after winning a free energy audit at a TASBO (Tennessee Association of School Business Officials) convention, Marshall County had the Building Technologies division of Siemens Infrastructure & Cities sector perform a preliminary analysis of each school building to understand the operational characteristics of the water, lighting and HVAC systems.

In November 2009, after reviewing the initial findings, Marshall County Schools contacted Siemens again to perform a detailed energy and cost analysis of the buildings. Siemens met with Sheldon Davis, Maintenance Supervisor of Marshall County, to discuss appropriate improvement measures for the school system. Discovering the schools had spent over $1.3 million on electricity, water and gas in 2008, Siemens recommended a variety of facility improvement measures to reduce utility usage. "We knew that energy was going to be the next thing we were going to have to look at," says Mr. Davis.

In May 2011, Siemens began the construction phase of the project, starting with lighting and water systems. Siemens completed construction that October. Within that time, Marshall County began accruing savings. Aside from reduced utility usage, the facilities cut CO_2 emissions, making the school system more environmentally friendly. With project costs just over $3 million, the County will find a payback for the project within 13 years.

Siemens Solutions

Because there were no upfront costs, Siemens proved to be a viable partner for Marshall County. The cost of the facility improvements is offset by the guaranteed energy savings. "As a byproduct of the way this program works, [school districts] don't need capital dollars for this program. We utilize their existing operating budget and implementing the measures often helps them save 20% to 30% off of

"The need for energy-efficient equipment upgrades was present and the savings associated with those upgrades were well within the guidelines of the EESI financing model. In the end, the successful implementation of the project created a win for Siemens and the personnel, teachers and students of Marshall County Schools."

Robert Clutsam, CEM, Energy Engineer, Siemens Industry, Inc., Buildings Technologies Division

Marshall County Schools Reduce Utility Usage with Siemens Solutions.

their utility bills," says Kirk Whittington, Business Development – Energy Solutions with Building Technologies.

Siemens utilizes the local workforce when applicable. By using Marshall County contractors, Siemens also contributed to stimulating the local economy. "And that helped put money back into the community," says Mr. Davis.

Siemens implemented lighting improvements for all 11 school buildings so they use less energy. To reduce waste, occupancy sensors were installed to turn off lights automatically. Overall, the retrofitted fixtures have a lower wattage rating, resulting in lower energy costs. Robert Clutsam, Energy Engineer for Siemens Building Technologies Division stated, "The difference in what they had versus what they have now has just been a dramatic change for them. That in itself is a win. Plus, we know the energy savings are there."

Water conservation measures were also made in all school buildings. The installation of flushometer toilets means that water flow is controlled in pint increments. For sinks, the installation of self-cleaning independent-flow control devices have led to the same level of performance but without residue accumulation. Additionally, at two schools, the existing domestic hot water boilers were replaced with new high efficiency boilers.

Siemens APOGEE® Building Automation System is used to control most of the district's school buildings. With regard to HVAC systems, new high efficiency units have been implemented. In nine buildings, existing thermostats have been replaced with BACnet thermostats. These communicate with Siemens panels located in each building's mechanical room.

The network now allows users to change set points and diagnose problems remotely. "There's a huge amount of manpower savings," says Mr. Whittington.

Other improvement measures included dishwasher replacements in three schools and window replacements in one school. Siemens also had sub-meters on the cooling tower makeup waterlines installed at two elementary schools. These improvements all contribute to a more efficient use of energy.

With the new improvements, Siemens provided appropriate technical training to Marshall County staff members.

Client Results

Although the construction phase has ended, Siemens will continue to measure and verify the savings for the school district. The projected annual savings are $227,875. Savings include:

- Lighting reduction of 845,308 kWh annually
- Water conservation of 2,139,655 gallons per year and 2,812 therms of natural gas per year
- 418 therms of natural gas per boiler per school per year
- CO_2 emissions cut by 249,751 pounds per year

The schools are now operating more efficiently and with greater comfort for students, teachers and administrators. By working with Siemens, Marshall County has proven their standards for operational integrity are as high as their standards for education.

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