



1 Background

Located in Murfreesboro about 30 miles southeast of Nashville, Middle Tennessee State University (MTSU) serves more than 22,000 students, awarding undergraduate and graduate degrees in a variety of academic areas including Business Administration, Fine Arts, Music, Science, Nursing, and Social Work. The campus consists of 109 buildings on a 466-acre (189-ha) site. As one of the 45 educational institutions governed by the Tennessee Board of Regents, MTSU receives funding for maintenance and capital improvements from the operating budget of the State of Tennessee.



Figure 1. Entry to Middle Tennessee State University.

By 1999, rapid growth in enrollment, a growing backlog of deferred maintenance, and the declining availability of state funding led the university to seek alternative methods to upgrade its aging facilities. Recognizing the potential of using energy cost savings to fund improvements to its energy infrastructure, the university established the Center for Energy Efficiency, which worked with the Tennessee Board of Regents to establish a program to allow self-funding of energy conservation projects.

2 The Project

In December 2001, after evaluating proposals from a number of ESCOs, MTSU awarded Siemens Building Technologies an ESPC with an ordering capacity of \$10 million. To date, approximately \$8.2 million of that capacity has been exercised. Completed projects include lighting upgrades in 1.5 million sq ft (139,000 m²) of building space, installation of a 10-MW backup generator (which allowed the university to switch to a lower-priced interruptible electric rate), HVAC retrofits, controls adjustments, and installation of vending misers on campus vending machines. Total savings from the conservation measures installed to date are estimated to be about \$900,000. Projects have been financed with Tennessee State School Bond Authority (TSSBA) bonds that have a maturity of 15 years.

Overall, MTSU officials have been satisfied both with the project and the process. The equipment is performing well, and MTSU believes they are receiving the savings that were projected.



3 Lessons Learned

Given the success of the MTSU program, the Tennessee Board of Regents developed a vehicle to allow other universities in its system to use ESPCs to fund energy conservation projects. In 2003, the Tennessee Board of Regents awarded three blanket ESPCs, one for each of the three main geographical regions of Tennessee (East, Middle, and West). The program is modeled on the DOE FEMP Super ESPC — an IDIQ contract was awarded to a single ESCO in each region, and institutions implement projects by issuing delivery orders against the IDIQ for their particular regions.

As in the DOE Super ESPC program, the project implementation process begins with a kickoff meeting between a regional ESCO and an acquisition team for the customer in that region. The institution presents its list of needed improvements and supplies the ESCO with an inventory of energy-related equipment, building areas, descriptions of energy management systems and procedures, utility billing records, and other needed information. The ESCO makes a preliminary site survey and uses the information gathered to develop an initial proposal. The initial proposal contains a summary of the potential scope of work, a list of ECMs, preliminary estimates of project costs and annual energy and maintenance savings, a subcontracting plan, and a preliminary project schedule.

After reviewing the initial proposal, the institution negotiates with the ESCO to further refine the scope of the project. When the institution is satisfied with the proposal, the ESCO performs a detailed energy survey. The detailed energy survey entails the collection of detailed information about the facilities and their operation needed to define the final project scope, construction costs, and energy and cost savings.

Information collected for the detailed energy survey is used to develop a final proposal, which provides the detailed project scope and cost proposal. The final proposal also includes detailed calculations of the energy and energy-related cost savings that will result from the project. On award, the final proposal becomes a contract in which the ESCO agrees to provide design and installation of the ECMs for a fixed price. Unlike the ESPCs awarded under the FEMP program, ESCOs in Tennessee Board of Regents contracts usually make no guarantees of performance beyond what is covered under equipment warranties. According to Joe Whitefield, director of the Center for Energy Efficiency, the Tennessee Board of Regents views the contract primarily as a funding vehicle, with energy conservation as a secondary benefit. For this reason, the program does not place much emphasis on measurement and verification (M&V) of savings. The institution is expected to assess the validity of the energy savings projections in the final proposal prior to contract award. The Center for Energy Efficiency at MTSU provides assistance to other universities in making these assessments.

Another major difference from FEMP's Super ESPC program is that ESPCs awarded under the Tennessee Board of Regents program are self-funded using bonds issued on behalf of the institutions TSSBA. Aside from warranties, the ESCO's role in the project essentially ends when the conservation measures are installed and accepted by the institution. ESCOs may also perform operations and maintenance on the installed equipment, but this would be done under a separate contract.

4 References

Center for Energy Efficiency at Middle Tennessee State University. Web page, <http://cee.web.mtsu.edu/>