



1 Background

In 1999, officials from the Sullivan County School District attended a seminar at Middle Tennessee State University and came away with the idea of using an Energy Savings Performance Contract (ESPC) to fund much-needed improvements in the schools the district operates in East Tennessee. The idea was put into practice in August 1999 when the district sent out a request for qualifications to ESCOs. Ten companies responded. Of these, three were selected to perform a walk-through audit of one of the school buildings to develop a preliminary proposal for the single building. After reviewing the proposals, the district selected Energy Systems Group (ESG), and invited the company to develop a formal proposal for all 28 of the district's schools.

2 The Project

After performing a detailed energy survey, ESG proposed a comprehensive set of ECMs. The final project, approved in June of 2001, included many of the measures typically applied in schools, such as lighting upgrades (primarily conversion of fluorescent lighting to T8 fixtures with electronic ballasts), HVAC system upgrades, replacement of single-pane windows with high efficiency double-pane windows, and an energy management control system. Other measures such as attic insulation, dropped ceilings (to reduce space conditioning requirements in spaces with high ceilings) and replacement of electric stoves and ovens with gas-fired equipment were included as well. Substantial savings in water and sewer costs would also be realized through replacement of lavatory fixtures. The total construction cost was \$24.2 million, which the school financed through a bond issue approved by the Sullivan County Commission.

The cost-saving measures included in the project were not limited to energy and water conservation alone. ESG also installed a new telecommunications system, which allowed the district to obtain telephone service at a lower cost. A new point-of-sale system implemented in school cafeterias has increased both sales and use of the low-income lunch program, which has increased revenue to the school district. An automated maintenance management system has reduced operational costs as well. These savings are tracked by ESG and the district, but are not part of the guarantee.

ESG does guarantee utility cost savings for the entire 15-year term of the project. M&V of these savings is based on utility bill analysis, in conformance with IPMVP Option C. As part of the detailed energy survey, ESG developed baseline energy use models for each school by correlating pre-retrofit gas and electricity consumption with heating and cooling degree days, the number of days in the billing period, and the number of occupied and unoccupied days in the billing period. Each school receives a monthly report on its utility use, and the district receives quarterly reports that compare actual utility costs for each school with what utilities would have cost under the baseline conditions. In addition, ESG produces an annual report that provides more detailed information on the savings accrued during the previous year. If the savings fall below the guarantee, ESG must pay the district the amount of the shortfall.

3 Results/Lessons Learned

According to Maintenance Director Joe Akard, the performance contract is proceeding exceptionally well, with savings ahead of schedule. During the first year of the performance period, ESG guaranteed \$753,000 in savings from electricity and gas costs and \$132,000 in savings from water and sewer costs. Actual savings, according to the utility bill analysis, were \$940,000 in electricity and gas costs and \$180,000 in water and sewer costs.



Figure 1. Library in Sullivan County, TN, School.

Note that the use of utility bill analysis as the primary method of M&V does have some drawbacks in contracts of this type. Since actual energy use determines the savings, the ESCO must pay close attention to energy use in the treated buildings to ensure, for example, that lights are turned out in the evenings, equipment is not left running over weekends, and temperature setpoints are not overridden. The ESCO must also keep track of any changes in the energy consuming equipment in the buildings (a new copy machine, for example) and adjust the baseline formula accordingly. In this case, ESG monitors energy use continuously via the internet and develops weekly reports that are shared with the district during twice-weekly meetings. ESG also helped the district write its first energy policy to define appropriate operating practices.