



Facing multiple facilities that needed improvements and having reached its bonded debt capacity, Madison County Schools opted for a capital recovery and reinvestment program that would pay for all improvements from the resulting energy savings.

The challenge

Named after James Madison, the fourth U.S. President, Madison County lies along the state's northern border with Tennessee. According to the 2012 U.S. Census Bureau report, of the 109,955 households in Madison County, one-third of them reported having children under the age of 18.

In 2013 Madison County Schools reported 19,764 students attending grades K-12 in 27 schools spread across 30 campuses, each comprising multiple buildings. For several years, many of these facilities had needed renovations ranging from HVAC and lighting to water conservation measures and building management systems.

Energy use was largely uncontrolled due to insufficient funding and aging systems. Over time the Board of Education's budget could no longer accommodate improvements to more than a hundred facilities. Moreover, Madison County Schools had reached its bonded debt limit capacity.

Having little to no ability to address its deferred maintenance or capital improvement projects, the future looked uncertain for Madison County Schools until Schneider Electric entered the picture. After representatives from Schneider Electric conducted a preliminary audit, they proposed an energy improvement program to pay for the much-needed improvements.

Schneider Electric proposed a turnkey solution offering guaranteed savings generated by the recommended improvements. In the unlikely event those savings are not realized, Schneider Electric will pay the difference.

The sheer size of this far-reaching effort involved addressing several challenges, among them financial issues and the project's size. Schneider Electric worked closely with the Board of Education to create a financial package that would not impact future bonding capacity. And both parties agreed to have the work completed in two phases.

The solution

The Board of Education and Schneider Electric collaborated to leave no stone unturned when the time came to fund this comprehensive project. In addition to leveraging federally subsidized qualified energy conservation bonds, they benefitted from the ADECA Local Government Energy Loan Program, TVA rebates and a tax-exempt lease purchase.

Schneider Electric built an energy center and installed its StruxureWare Building Automation System (BAS). This new BAS facilitates the management of more than 34,000 points of access across 30 campuses with multiple facilities – and it does it all from a single location.

The installation of new meters enables Madison County Schools to track and trend its energy use with Schneider Electric's Resource Advisor. This enterprise-level, online



Customer benefits

- Turnkey solution with guaranteed savings
- Reduced energy consumption and costs
- Increased energy and water efficiency
- Improved operations and comfort levels
- Local and remote system access

sustainability and energy management software tool provides instant, secure access to energy and environmental information.

Schneider Electric replaced or renovated more than 40,000 lighting components. Indoor T8 bulbs with electronic ballasts and automatic occupancy sensors replaced less efficient T12 lights with metal ballasts. High-bay fluorescent lights with instant strike capability replaced outdated metal halide lighting in gyms. Outdoor LED lighting replaced standard high-pressure sodium bulbs, providing a clean white look. All new exterior LED lighting now ties into the StruxureWare BAS.

Installation of a new IT enterprise management system now controls more than 8,000 pieces of IT equipment – from computers and monitors to printers, faxes and smartboards. In addition, the new system helps reduce the amount of energy used to operate these devices.

The contract also called for major HVAC replacements or upgrades across seven campuses. During Phase 1, Schneider Electric took advantage of new variable refrigerant flow (VRF) technology at three campuses. This technology uses a refrigerant as both the cooling and heating medium, provides a modular approach to installing lightweight units, offers design flexibility, facilitates maintenance commissioning, enables precise temperature control and increases overall energy efficiency.

Renovations at one middle school included installation of a completely new chilled water HVAC system. At another middle school, Schneider Electric redesigned the existing piping and pumping systems to increase energy efficiency. Phase 2 called for Schneider Electric to carry out a similar HVAC replacement using VRF technology at another elementary school, as well as the central operations building.

Major water renovations involving fixture commissioning and upgrades across all 30 campuses will save Madison County Schools more than 200 million gallons of water over the 20-year term of the contract.

After commissioning each system, Schneider Electric's Performance Assurance Support Services (PASS) kicked in. PASS provides remote 24/7 monitoring, technical support, and a complete analysis and reporting of energy use to guarantee savings and project performance after the initial installation.

The bottom line

This is the largest K-12 energy project to-date ever undertaken in Alabama. Madison County Schools expects to generate \$40 million in capital savings over 20 years, reduce utility costs by 30 percent and energy use by 40 percent, and increase energy and water efficiency.

This project incorporated not only system design and facility renovations, but also an energy-saving guarantee that would allow Madison County Schools to ultimately fund all the needed improvements.

Upgrades to multiple facilities at 30 campuses will reduce energy consumption by 40 percent, saving taxpayers approximately \$1.5 million each year in utility costs. In addition to bolstering fiscal responsibility, this project contributes to improved learning environments.

The environmental impact of this two-phase project is equivalent to removing 52,000 cars from the roads, removing 242,000 tons of carbon dioxide from the atmosphere or planting 65,000 acres of trees.

“Our facilities were facing much needed improvements that we had been forced to put on hold because of a lack of funding. Now we’re paying for them with the energy savings generated by making these improvements.”

Dr. David Copeland, Superintendent of Schools

Project at a glance

Location	Huntsville, Alabama
Project type	Capital recovery and reinvestment program
Properties	30 campuses (136 buildings, ~3.5M sq.ft.)
Funding	Over \$14 million in Qualified Energy Conservation Bonds \$500,000 from the ADECA (Alabama Department of Economic and Community Affairs) Local Government Energy Loan Program Over \$500,000 in TVA (Tennessee Valley Authority) rebates
ECMs	StruxureWare BAS Lighting upgrades/renovations IT enterprise management system HVAC replacements/upgrades Water fixture commissioning/upgrades Smart meters
Annual savings	~ \$1.5 million (\$40 million in capital savings over 20 years)
Installation	2012

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