Williamson County School District (Tennessee)

Organization Size: 42 schools (32,000 students in K-12)
Primary Work Completed: Replace cooling towers, boilers, HVAC units, heat exchanger; lighting retrofits; energy management control systems
Project Cost: $5.7 million
Type of Financing: Lease-purchase agreement, bank note, general obligation bond
Simple Payback Period: 6.5 years (net project cost / savings per year)
Key Benefits: Lower energy bills, replace aging equipment, improved energy controls, funding for an energy resource manager

In 2000, Williamson County School District (WCSD) entered into an energy savings performance contract (ESPC) with an energy services company (ESCO) and completed a $5.7 million lease-purchase agreement to fund a range of energy-related improvements across 27 school facilities. The original lease-purchase agreement was subsequently re-financed twice – initially with a bank note, and again as part of a County general obligation bond.

Leveraging Energy-related Improvements to Improve Energy Use Management

Before pursuing energy-related improvements in 2000, WCSD staff could not answer basic questions about whether utility bills were accurate or energy was being wasted. The district's energy project was primarily motivated by the desire to modernize equipment and better manage energy use. In addition to replacing equipment (cooling towers, boilers, HVAC units, a heat exchanger, lighting retrofits, and other energy/water saving measures), a major element of the project was the installation of energy management systems (and updates to existing systems), so that all school buildings were on a single system that could be managed from a central location.

The school district had some experience with these systems prior to the ESPC, and WCSD Maintenance Director Mark Samuels noted that, "We realized that having a district-wide energy management system was not enough – we needed an energy resource manager to operate the system. But, we could not afford a new position and would have struggled to get approval for a head count increase. We built this position into the ESPC." The ESCO employed the energy resource manager, enabling the school district to pay for the cost of this position out of its energy savings. In addition to managing the district's energy systems, the energy resource manager, Dawn Johnson, helped to train the school district's maintenance staff on how to manage equipment and the opportunities that data-driven energy management creates. Performance contracting was new to WCSD staff, so Johnson also spent significant time educating district staff

Case study excerpted from: Borgeson, Merrian, and Zimring, Mark. *Financing Energy Upgrades for K-12 School Districts: A Guide to Tapping into Funding for Energy Efficiency and Renewable Energy Improvements*, 2013.
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on the ESPC (e.g. escalation rates, guarantee structure, payment periods). Her work was so valuable that, when the ESPC ended, the school board elected to fund an ongoing salaried energy manager position.

Lease-Purchase Agreement Helped Overcome Up-Front Cost Barrier

Williamson County experienced significant population growth over the past 15 years, necessitating an increase in school facilities – the district has grown from 27 to 42 schools since 2000, with more planned. At the time this project was proposed, the County wanted to reserve its general obligation bonding capacity for financing new buildings. Without access to general obligation debt, a 4.53 percent interest rate for a 10 year lease-purchase agreement gave the school district an outlet to retrofit existing facilities. WCSD had to pay debt service on this agreement from its utility budget, so it signed an ESPC to ensure that it would realize the expected energy savings. This ended up being a good choice – in the first three years of the contract, WCSD did not achieve the guaranteed savings level, so the ESCO made payments totaling $155,000 to make up for the savings shortfall.

> ***You have no control over how much you pay for energy. The only thing you can control is how much energy you use***
>
> - Mark Samuels, Maintenance Director at Williamson County School District

Opportunistic Re-Financing Benefited Taxpayers

About a year after the lease-purchase agreement was signed, the county opted to convert the agreement to a bank note, which offered a more attractive interest rate of 3.9 percent. The school district remained responsible for making these lower debt service payments on the note out of its operating costs. Subsequently, in 2003, the County used a portion of the proceeds from a general obligation bond to pay off the balance of the bank note. This takeout provided WCSD with a huge benefit – taxpayers make all principal and interest payments on general obligation debt, so the school district no longer had to allocate a portion of its energy savings to debt service.

This move was beneficial for taxpayers as well. A County sales tax covers much of the school district's operating costs, so taxpayers were implicitly paying for bank note debt service. The County saw the general obligation bond takeout as an opportunity to reduce overall taxpayer debt service costs, as the general obligation bond interest rate was 2 to 3.5 percent, depending on maturity, versus the bank note at 3.9 percent. Although the County voluntarily restricts itself to an annual debt service cap based on its property tax revenue base, in 2003, it was issuing a general obligation bond and had room under the cap to upsize the bond issuance to include sufficient proceeds to pay off the bank note.

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Controlling Energy Use to Limit Exposure to Rising Utility Costs

Over the 10 year life of the project, WCSD experienced significant utility rate increases. Energy-related improvements gave the school district a tool for buffering itself from these higher prices – Samuels pointed out that, "You have no control over how much you pay for energy. The only thing you can control is how much energy you use. The ESPC allowed us to control our use at no cost." While energy costs per student have increased since 2000 due to increasing energy rates, energy consumption per student and per square foot have declined by more than half (Table 1), helping the school district to avoid what would have been far more substantial cost increases.

	1999-2000 (pre-ESPC)	2008-2009 (post-ESPC)
Cost per Student	$128.77	$190.90
Cost per Square Foot	$0.93	$1.29
Consumption per Student	4,315 kWh	1,914 kWh
Consumption per Square Foot	33kWh	13kWh

Table 1. Annual Energy Cost and Consumption Per Student and Per Square Foot

Energy-related Improvements Create New Energy Saving Opportunities

The district's energy controls have afforded it additional saving opportunities. In addition to helping the district to prioritize future capital improvement needs, the school has been generating about $50,000/year by participating in a regional demand response program, through which it agrees to reduce energy use if asked to during peak periods in exchange for an annual payment. Samuels' explains, "Centralized controls allow us to easily manage systems from a single web-based location and curtailment events rarely impact schools – 10 of the 11 events over the past three years have been in the summer."

Samuels reiterated the high value of these controls, "Just the ability to have a consistent building management system that allows us to manage systems from a single web portal is invaluable to being able to control consumption. I shake my head at my contemporaries in other districts where the only thing they can do is physically go to each classroom in each school and change the thermostats – it's very inefficient."

Resources

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