

EnergySmart Schools Program Helps Districts Clear Financial Roadblocks

By Margo Appel

Guilford County Schools and other districts around the nation are discovering that high-performance schools conserve energy, help the environment, improve student and teacher performance and save money.

The goals seemed imposing, if not impossible: Guilford County Schools in North Carolina set out to build a facility that would use about half the energy of a typical school, improve students' academic performance, offer lessons in environmental conservation, and better occupants' health, safety, and comfort. Plus, the school's construction could not cost more than that of a similar, traditional school.

When the Greensboro, North Carolina, school district opened its

Northern Guilford Middle School in January 2007, it unveiled a holistically energy-efficient, high-performance school. On most days, natural light is the building's primary source of lighting, thanks to daylighting techniques such as curved, translucent light shelves and sloping, reflective ceilings. Rainwater catchment and onsite, plant-based waste treatment systems provide the school with nine million gallons of water for use in toilet flushing and athletic field irrigation. A drain-back solar thermal system heats 75

percent of the facility's water. The school, designed by Raleigh-based architectural firm Innovative Design Inc., also features an 18-foot sundial and a solar greenhouse attached to a science classroom.

These features add up to a building that uses about half the energy consumed by similar schools, costs less to operate than traditional schools, and provides real-life conservation lessons. The district not only spent about the same amount of money on the green facility as it would have spent on a non-green building, but it also expects the school to save more than \$70,000 every year on energy costs. That means the lifetime cost of the middle school will be well below a standard school's lifetime cost.

"Northern Guilford Middle School demonstrates that you can build a school that provides a better learning environment, reduces long-term operating costs, and lessens the impact on the planet without spending more money up front," says Joe Hill, Guilford County Schools' facilities consultant.

Different Paths, Same Destination

Guilford County Schools and other districts around the nation are discovering that high-performance



Northern Guilford Middle School boasts an 18-foot sundial.

schools conserve energy, help the environment, improve student and teacher performance, and save money. The nation's 14,000 K-12 school districts spend more than \$12 billion every year on energy, according to data from the National Center for Education Statistics and *American School and University*. The U.S. Department of Energy (DOE) estimates an energy-efficient school district with 4,000 students could save as much as \$160,000 in energy costs annually—or \$1.6 million within a decade. That money could be redirected toward other educational initiatives, such as hiring more teachers or purchasing better computers.

But every district's journey toward energy efficiency is different. For every district that can afford to build a high-performance school from scratch—such as Guilford County Schools—there are hundreds more that must rely on retrofit and renovation projects to introduce energy-efficient elements into schools. Even if the short-term savings and the long-term economic benefits of energy efficiency improvements are obvious, it is hard for many school districts to secure upfront capital for high-performance projects. Moreover, once buildings become more efficient, districts need to establish operations and maintenance plans to sustain the energy and cost savings. This could require additional funds, depending on the scope of the O&M plan. These could be some of the



reasons why school administrators often cite financing as the main reason they are reluctant to build a high-performance school.

DOE created the EnergySmart Schools Program to help districts navigate these issues. The two-year-old, public-private partnership provides tools and resources to help school districts around the country find creative and affordable ways to construct and renovate high-performance schools. The program, which is endorsed by the National School Boards Association, encourages schools and districts to adopt strategies that decrease energy use, lower greenhouse gas emissions, and improve the overall quality of schools. Specifically, the program aims to make newly constructed schools 50 percent more efficient and existing schools 30 percent more efficient than current energy codes within the next three years.

The EnergySmart Schools Program takes on those goals by providing tools that help districts plan, finance, design, build, operate and maintain high-performance buildings. Among other activities, the program outlines the energy and monetary benefits of constructing or renovating a high-performance school, highlights the non-energy and non-monetary benefits, such as improvements in teacher and student performance, and helps district officials use the information to craft

a business case to win over stakeholders and community members. The program also outlines financing options and presents basic investment principles that help districts evaluate returns on energy-efficient investments. The program presents this information in a series of guides, training opportunities, such as webinars, and other resources.

Paving the Road to High-Performance School Financing

The *Guide to Financing EnergySmart Schools*, which was published in October 2008, is the program's main tool for outlining ways to finance new construction, retrofits, and renovation projects. Directed at K-12 school administrators, school board members, and others involved in facilities planning, the guide uses accessible language to help its audience understand the financial returns of energy-efficient projects and to provide a cross-section of financing options. The guide also helps officials make a business case for these projects to taxpayers, investors, banks, non-profit organizations, and state and federal officials.

The finance guide outlines principles of financing high-performance schools, including six investment principles that are important considerations during the financing design process. The six principles—determine project objectives, avoid



cream skimming, identify all cash flows, focus on life-cycle cost analysis, select an effective cost-benefit method, and monitor and verify results—apply to investments in new construction and major renovations projects, building retrofits, exterior lighting upgrades, cogeneration plants, renewable energy technologies, and district heating and cooling systems.

The guide offers resources for evaluating the viability of capital investments. It also details four financing options and the relevant state, federal, and nonprofit resources that may be available to schools that are considering incorporating energy-efficient, high-performance design into a project. The four financing options include internal financing, debt financing, leasing arrangements, and energy savings performance contracts.

Assistance Along the Way

As a follow-up to the release of the guide, the EnergySmart Schools Program hosted a National Financing Roundtable, which was held prior to the seventh annual High Performance School Symposium of the Council of Educational Facility Planners International (CEFPI). The event brought together experts in various areas of school construction and renovation, including representatives from CEFPI, the American Federation of Teachers, the U.S. Green Building Council (USGBC), the Collaborative for High Performance Schools (CHPS) and other organizations, for a discussion about financing issues and options.

Key points of the roundtable discussion included the call for district decision-makers to learn more about energy efficiency projects and to discuss financial and technical issues with stakeholders, such as teachers, facilities staff members, school board members and others. Roundtable participants also urged district leaders to encourage community, teacher, and student

involvement in such projects. This move, participants say, will increase awareness about energy efficiency and pressure legislators to provide funding.

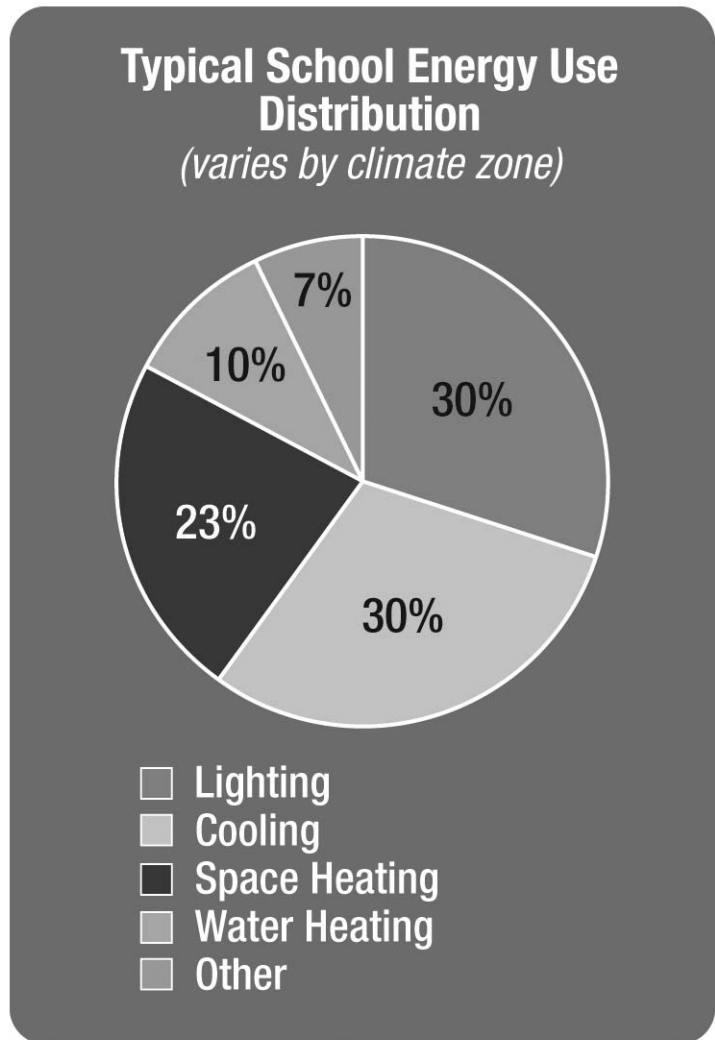
Roundtable participants also reported that restrictive debt rules in some states limit the financing options available to schools. Moreover, because incentives for energy efficiency differ from one state and utility to another, it is difficult to replicate successful public-private partnerships, participants say. As possible solutions, contributors suggested federal officials evaluate energy efficiency incentives. Also, officials at the federal and state levels should standardize incentives for energy efficiency to encourage the development of holistic public-private partnerships, the roundtable participants suggested.

The roundtable also included a discussion about the American Recovery and Reinvestment Act of 2009 (ARRA). Some participants voiced a concern that aspects of the act would push schools to make decisions that will influence construction plans during the next few decades.

Less than two weeks after the program hosted the financing roundtable, President Barack Obama signed into law ARRA, which

included funding for green schools. The act states that the U.S. Department of Education will distribute \$53.6 billion in ARRA funds to states. Each state’s governor will use 18.2 percent of the state’s allocation for various projects, which may include assistance for energy-efficient renovation or retrofit projects at public schools, colleges, or universities.

In response to questions and concerns about ARRA, participants suggested that planners and district leaders make energy efficiency a prime consideration at the beginning of the new construction design process. Participants also urged district administrators, facility designers, and others to identify creative



funding mechanisms and low- or no-cost projects to help achieve energy efficiency in schools. Energy efficiency projects shouldn't just be tied to large capital investments, participants say, because efficiency improvements can be reached through small efforts when funding is limited.

The *Guide to Financing EnergySmart Schools* notes that most new school construction and major renovation projects are happening in suburban school districts and in states with growing populations. There is a trend toward high-performance building, according to the guide, but increased awareness of energy-efficient building is needed. Meanwhile, many urban and rural school districts with few new construction plans and limited resources opt to retrofit and upgrade existing buildings, the guide notes. In many of these cases, declining population growth is leading to district consolidation, resulting in the need to upgrade aging infrastructure.

Alternative Routes to Consider

A new resource recently released by the EnergySmart Schools Program sets out to help urban, suburban, and rural school districts, regardless of their path to high-performance. The *Guide to Operating and Maintaining EnergySmart Schools* leads schools through the process of creating an energy-efficient operations and maintenance (O&M) plan, introducing low- and no-cost efficiency improvements into existing buildings, and designing high-performing renovation or retrofit projects. Sponsored by CEFPI, the guide allows users to adapt and implement O&M strategies to address specific energy efficiency goals.

The guide's primary audience is a district's senior facilities and supporting O&M staff, so it details and expands upon tools and resources that are widely used in the high-performance school industry. Facilities

staff should use the guide to manage district energy costs by properly identifying and implementing O&M, repairs, and retrofits, and by calculating O&M measures' life-cycle costs and benefits. But school district management, business officials, and administrators should also use the guide to become better acquainted with high-performance O&M strategies and ways to integrate these strategies into new and existing energy policy.

The O&M guide complements another resource available at the EnergySmart Schools Program's Web site (www.energysmartschools.gov). The American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE), American Institute of Architects (AIA), Illuminating Engineering Society of North America (IES), USGBC, and DOE developed the *Advanced Energy Design Guide for K-12 School Buildings* with the goals of improving schools' energy efficiency by 30 percent over existing code and helping schools make smart energy investments so that more money is channeled into education. Its authors see the guide as a step toward the creation of net-zero energy schools, or schools that produce as much energy as they consume.

Specifically, the design guide provides recommended guidelines, based on climate zones, to help schools become more energy efficient. It also outlines implementation tips that can be applied to new construction or major renovation projects. Its case studies highlight schools around the country that have achieved or exceeded the 30 percent efficiency goal.

The design guide, the financing guide, and the O&M guide are augmented by other EnergySmart Schools resources, such as classroom lesson plans and activities, webinars, and other training opportunities, which are also available at the program's Web site. In fact, the

Web site illustrates the tools available to the nation's school districts through the EnergySmart Schools Program.

A Timely Voyage

DOE offers these tools because it sees this as a time of tremendous opportunity. States and local agencies are planning to invest more than \$60 billion to build or renovate schools in the next three years. The choices these agencies make could greatly impact the way the nation consumes energy. After all, according to the 2004 Buildings Energy Databook, 18 percent of the nation's energy is used to light, heat, cool, and otherwise operate commercial buildings, including schools.

If all of the nation's school districts constructed high-performance schools or took on energy-efficient retrofit projects, they would collectively save \$2 billion every year. The districts would also provide healthier learning environments, familiarize the community with energy efficiency technologies and practices, and help slow power plant demand, thereby reducing greenhouse gas emissions. Districts and schools can shape students' futures in more ways than one. ■

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