

Building Technologies Program

EnergySmart Schools

Lower operating costs, healthier learning environments ... and a brighter energy future

Creating energy-efficient schools can play a big role in easing the dilemma faced by every school district in America: fulfilling ever-increasing educational needs in the face of tight budgets. It is a difficult juggling act, but a growing number of schools are discovering that smart energy choices can have lasting benefits for their students, their communities, and the environment.

A look at the bottom line is telling. An energy-efficient school district with 4,000 students could save as much as \$160,000 a year in energy costs. Over a 10-year-period, those savings can reach \$1.6 million and, over the lifetime of the facility, many millions more. Looking at finances alone, those savings translate into the ability to hire more teachers, buy more computers, or upgrade instructional materials.

Other Benefits

But energy-smart schools offer many other benefits as well. Daylighting, for example, is used in energy-efficient schools to deliver natural lighting to classrooms and to reduce electricity usage. Studies have shown a potential connection between the use of daylighting in classrooms and improvements in student performance and attendance.

Some school districts incorporate water conservation measures into their projects as well, furthering cost savings and environmental performance. Others incorporate backup power generation—sometimes from renewable energy sources—equipping these schools to play a vital role in homeland security as emergency community shelters. In general, energy-smart schools offer healthier learning environments and serve as “living laboratories” to teach school personnel, students, and the broader community about energy efficiency.

DOE's EnergySmart Schools Program

K-12 schools spend more than \$8 billion annually on energy, making energy the second-highest operating expenditure for schools after personnel costs. Recognizing this, the U.S. Department of Energy sponsors the EnergySmart Schools Program.

Endorsed by the National School Boards Association, the program promotes the building of new schools that exceed code by 50 percent or more. In addition, it promotes a 30 percent improvement in existing schools. The program offers tools and resources to help decision makers plan energy-efficient schools and access available financing. It also offers materials to educate building industry and other professionals about the design, construction and maintenance of high-performance schools.



Start with Some Small Steps

Introducing energy efficiency to your school district doesn't have to begin with photovoltaic solar panels.

Technological and behavioral changes can reduce energy inefficiencies by up to 60%.

Consider the cost of:

- ✓ *Leaving a computer on—\$0.01 to \$0.03/hour*
- ✓ *Leaving a copier on 24 hours a day—up to \$150/year*
- ✓ *Operating each soft drink machine—up to \$300/year*
- ✓ *Operating a urinal—\$450/year in water/sewer/maintenance*

For more information, contact:

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Fossil Ridge High School, Fort Collins, Colorado

“The number one question we get is how much more did it cost? And our standard answer is that it doesn’t have to cost you any more.”

– Stu Reeve, Energy Manager

With its photovoltaic-paneled canopies and white reflective roof, Fossil Ridge High School is a marvel of energy efficiency. It buys wind power for 100 percent of its electricity needs, uses advanced water conservation techniques, and has high-performance occupancy sensors and dimming systems. Constructed in 2004, the project met its \$38 million budget—no more than the cost of a similarly-sized conventional school.

“The key factor is right sizing,” says Stu Reeve, energy manager for Poudre School District, which has 45 schools and 24,000 students. “You’re building a better building envelope and the insulation is better, so your mechanical systems get smaller. You right-size your HVAC—you look at the whole picture, including how asphalt parking lots generate heat in sunshine. It’s building smarter. That’s how you do it.” Poudre School District has been a national leader in energy-smart building practices, utilizing technical assistance offered through DOE’s EnergySmart Schools Program.

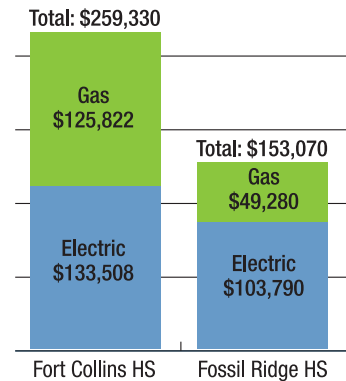
Reeve stresses the intricate process of integrated design and the need, from day one, to commission a construction and design team

that understands high-performance building. Every single decision is made with energy efficiency in mind and a clear understanding of how landscaping affects window design and placement, for example.

The result is a beautifully designed building where students are learning the ins and outs of energy efficiency and where energy savings can be invested in educational needs. Reeve said Fossil Ridge’s energy costs are about \$100,000 less a year than the district’s comparable but conventionally-built Fort Collins High School.

To Reeve, the district’s emphasis on energy-smart schools is “a good business decision,” plain and simple. Of Colorado’s 178 school districts, Poudre School District’s operational funding from the state is ranked at 170. “We’re not rich, and we know that when we have the opportunity to build a new school, we may not get another chance for some time. These buildings compete with education mission and goals. I look at the savings and say, ‘how many teachers could that buy you?’”

Energy Efficiency’s Bottom Line



Fossil Ridge High School’s FY06 annual energy costs were \$106,260 less than those at Fort Collins High School, a comparable but conventionally-built school in the same district.

A Strong Energy Portfolio for a Strong America

Energy efficiency and clean, renewable energy will mean a stronger economy, a cleaner environment, and greater energy independence for America. Working with a wide array of state, community, industry, and university partners, the U.S. Department of Energy’s Office of Energy Efficiency and Renewable Energy invests in a diverse portfolio of energy technologies.



U.S. Department of Energy

Energy Efficiency and Renewable Energy

Bringing you a prosperous future where energy is clean, abundant, reliable, and affordable

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Photo: David Patterson; RB+B Architects, Inc.