Get Smart
About Energy

Save money. Create better places to teach and learn.

School energy costs are too high

Energy costs in schools are bigger than most of us ever imagine. The typical school district spends $400,000 each year on utility bills while those in huge metropolitan areas may spend $20 million or more. In most districts, utilities are the second-largest expense after salaries.

Other energy-related costs are more hidden and, perhaps, even more harmful to education. Inadequate lighting systems, uncomfortable classroom temperatures, and poor acoustics take their toll on teachers and students alike. Poor air quality from inadequate design and maintenance of heating and cooling systems threatens their health.

Clearly, the costs of energy in schools are too high.

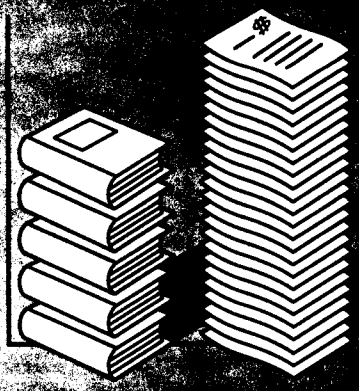
Smart energy use offers big benefits

The astonishing fact is that most schools could save 25 percent of these high costs by being smart about energy. In the typical district, that's $100,000 in savings each year. Nationwide, the savings potential is $1.5 billion, or enough to pay for 30,000 new teachers every year.

While improving their energy use in buildings and bus fleets, schools are likely to create better places for teaching and learning, with better lighting, temperature control, acoustics, and air quality. Smart districts also realize benefits in student performance. Daylighting—a common system in energy-efficient schools—provides ample natural light, which has been associated with higher test scores.

The view from Grandview, Missouri

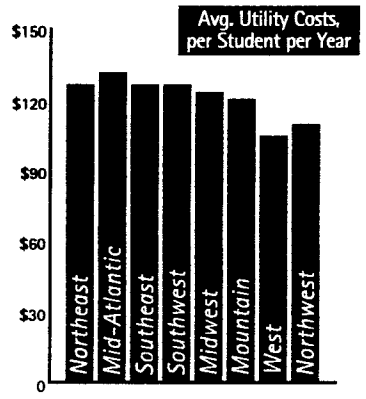
In the Grandview school district's 1998/99 budget, utilities represented the largest area of expenditure after personnel. No other single category in the operating budget commanded as much money. While figures may vary from district to district—depending on size, number of students and facilities, State and local reporting requirements, and other factors—many districts, like Grandview, spend more on utilities than they do on textbooks.



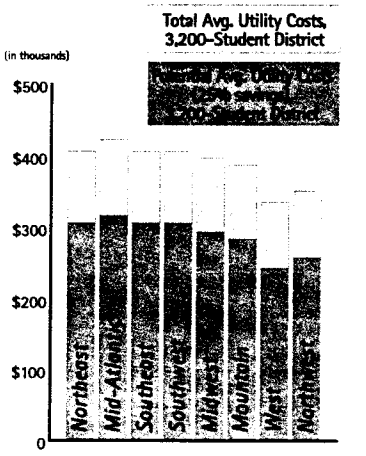
1998/99 Grandview Expenditures

In many school districts, Grandview spends more on utilities than on textbooks.

How much does your school spend?



How much could it save?



Note that energy consumption is related to climate and a host of other factors, and that utility costs vary from one energy provider to the next.

Any school can do it

Schools have a range of options for being smarter about energy, from no-cost changes to large-scale renovation projects.

- Behavioral changes alone can greatly affect energy consumption. Just turning off one typical computer at night and on weekends can save more than $30 annually—a district with 100 computers could save $3,000 each year.

- Operations and maintenance improvements can provide substantial savings at very little cost and give schools more funds to spend on textbooks and teachers. The Idaho Falls School District in Idaho saves more than $20,000 annually just by turning down thermostats over winter holiday breaks.

- Building renovations or retrofits offer even greater benefits. Alaska's Tanana School District cut its lighting energy costs 25 percent by installing high-efficiency lighting and occupancy sensors. The superintendent said the lighting quality was so much better that staff asked if walls had been painted. The Daniel Boone High School in Tennessee completed an even bigger project, installing a geothermal heating and cooling system to save $82,000 annually.

Energy's impact on student performance

Evidence is growing that energy systems in school buildings are directly linked to student performance and health. Some of the links are intuitive: students can't read the blackboard if lighting is inadequate, can't hear clearly over the din from noisy heating and cooling systems, can't concentrate if they're freezing in classrooms with poor temperature control, and are likely to miss school days if their asthma is aggravated by indoor air contaminants that travel through heating, cooling, and ventilation systems.

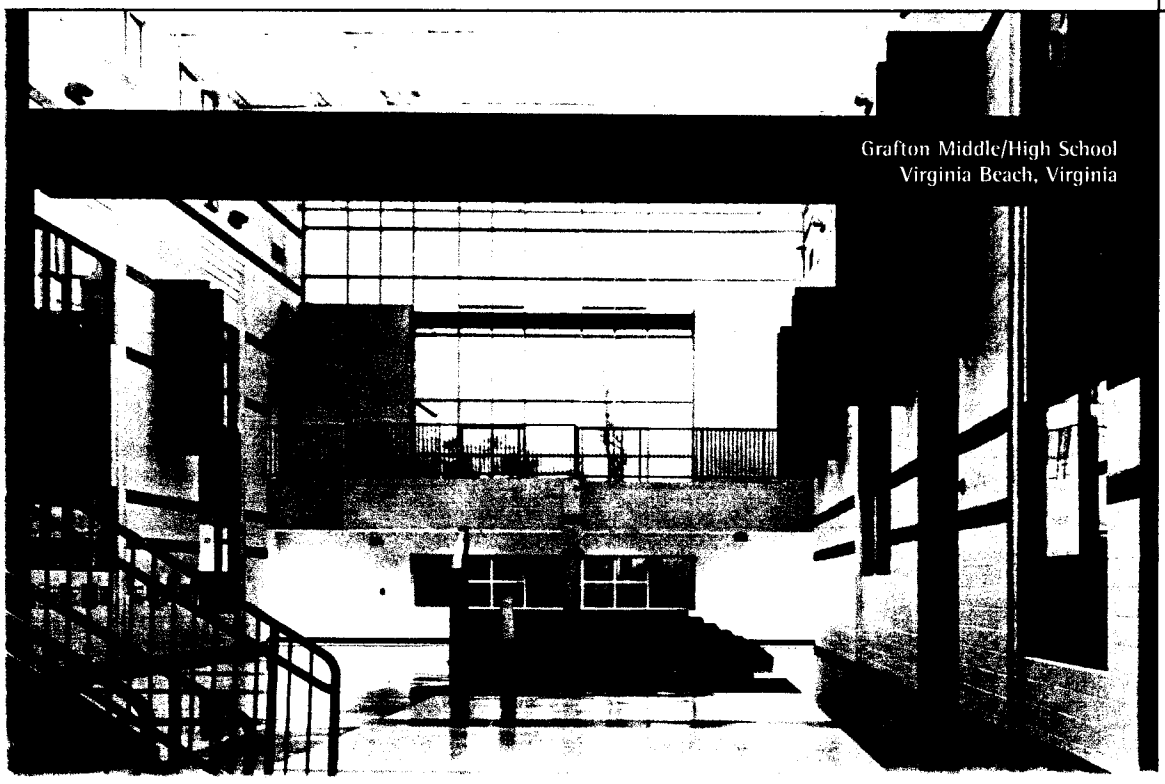
Initial research is providing additional evidence of strong connections between daylighting—building systems that capture sunlight for indoor lighting—and better student performance. A 1999 study by Heschong Mahone Group (sponsored by Pacific Gas & Electric Company) found that students in three districts with daylit classrooms scored 7 to 26 percent higher on reading and math tests than those in classrooms with minimal amounts of daylighting. Another study—by the architecture firm Innovative Design—found that students attending three daylit schools in North Carolina outperformed students in neighboring, non-daylit schools by 5 to 14 percent. More research is needed on this topic, and the U.S. Department of Energy is looking forward to working with a variety of partners to document the positive effects of

- New buildings that are smart from the start offer great potential for both energy savings and improved learning environments. The Grafton Middle/High School in Virginia, for example, uses 32 percent less energy than the average school in its region and 9 percent less energy than local energy-performance goals. The buildings' energy-efficient design—which also uses renewable energy—means the school saves money despite operating well beyond standard school hours.

- Buses that use alternative fuels not only reduce pollution in areas where children learn and play but often cost schools less than traditionally fueled buses. After accounting for both fuel and maintenance, the newest compressed natural gas buses at California's Antelope Valley School District cost 11 cents per mile less than advanced diesel buses and are quieter and far less polluting.

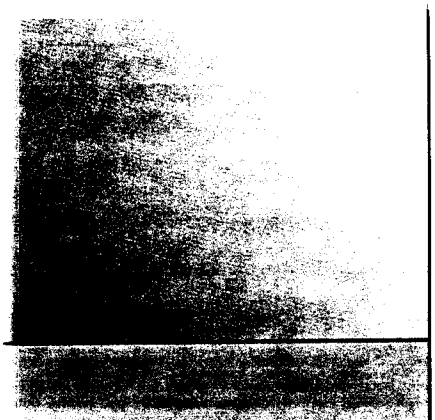
- Energy learning activities ensure that students get hands-on educational opportunities, learn about energy and the environment, and become future consumers and leaders who understand the value of being smart about energy. Like numerous schools, the Bluffsview Elementary School in Ohio has a solar electric system that not only provides clean energy but is monitored by students and teachers as part of the science curriculum.

lighting—using sunlight for indoor lighting-may improve student performance.



Grafton Middle/High School
Virginia Beach, Virginia

Hedrich Blessing, courtesy of Burt Hill Kosar Rittelmann Associates

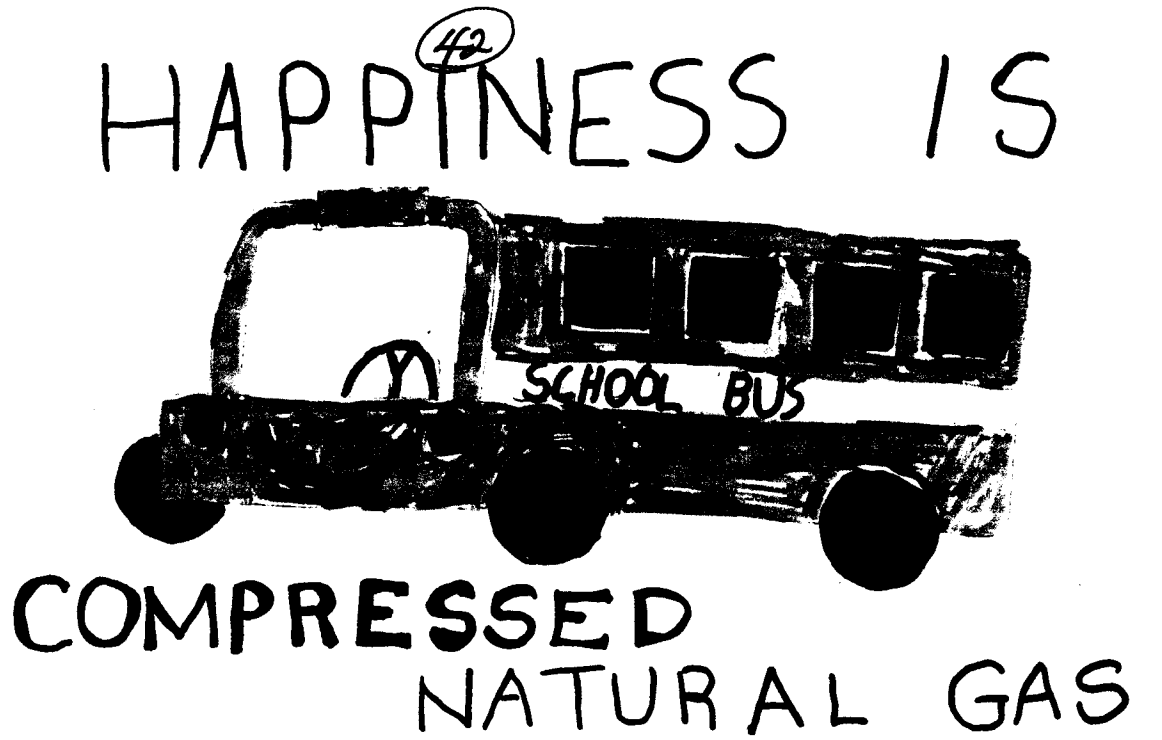


Rebuild America:

The program behind EnergySmart Schools

EnergySmart Schools is part of Rebuild America, a national DOE initiative aimed at improving energy efficiency in buildings. This means that if your school is part of a Rebuild America community partnership, you're ready to benefit from EnergySmart Schools.

Just be sure you ask about energy improvements and educational materials for your bus fleet as well as your buildings—Rebuild America focuses on buildings, but its representatives can also direct you to resources for buses. After all, the goal of EnergySmart Schools is a comprehensive one: a Nation of schools that are smart about energy in every way.



Elementary school student David Faich won the grand prize in a poster contest among Philadelphia students.

Get help from EnergySmart Schools

The U.S. Department of Energy created EnergySmart Schools to focus on improving the energy efficiency of K-12 schools. It addresses not only buildings but also bus fleets and student learning activities.

The core of Rebuild America's EnergySmart Schools is a voluntary network of community partnerships formed by school districts and local organizations. These partnerships get access to resources for improving energy use—customized assistance, workshops, and technical tools, to name a few. EnergySmart Schools also builds awareness among local leaders and school administrators about the high price schools and their communities pay for wasted energy.

EnergySmart Schools works to remove barriers to school energy improvements and encourages businesses to provide more energy-saving products and services tailored to schools. A particularly important piece of this work is the development of Energy Design Guidelines for schools.

Finally, EnergySmart Schools creates and locates educational materials so that tomorrow's decision-makers build better buildings, use renewable energy technologies, design better buses, and continue to be smart about energy.

Rebuild America
U.S. Dept. of Energy

How schools participate

School districts participate in EnergySmart Schools by joining or creating a community partnership. Some partnerships are statewide, while others represent a single community; some may be the school district alone, while many others include city and State governments, financial institutions, and local businesses such as utility companies. The participants make that choice.

Community partnerships get help from a local EnergySmart Schools representative. This person guides the partnership to resources for assessing their energy opportunities, developing an action plan, and implementing the plan. The action plan identifies target buildings, systems, or buses; sets goals for energy savings; identifies financing options; and describes how the partnership will coordinate and mobilize its efforts.

To get started with EnergySmart Schools, call DOE's Energy Efficiency and Renewable Energy Clearinghouse at 1-800-DOE-3732, or go to www.eren.doe.gov

Visit the EnergySmart Schools Web site at: www.eren.doe.gov/energysmartschools

How do your school buildings rate?

The ENERGY STAR label on a school building's wall tells an important story. The label not only describes a school building whose energy performance is among the Nation's top 25 percent—it lets taxpayers know you're using money wisely, spending the resources on education instead of high energy bills. The label tells students that their school cares about the environment, that you're doing your part to reduce energy-related pollution. And it indicates that your school probably has the great lighting, comfortable temperatures, and high-quality air that so often go hand-in-hand with smart energy use.

To determine if your buildings qualify for this label from DOE and U.S. EPA, your facilities director or other professional should provide data about your school's energy use over the past 12 months, the square footage of your buildings, the number of students enrolled, and other details. You can then enter this data into the ENERGY STAR computer analysis tool available on the Internet.

Each school building that scores 75 or higher, while maintaining indoor air quality that meets industry standards, can apply for the ENERGY STAR label. Buildings that rate below 75 should be assessed for energy savings opportunities with help from EnergySmart Schools.

For more information about the ENERGY STAR label and analysis tool, go to: www.energystar.gov

Money Isn't All You're Saving

Photo by Hedrich Blessing, courtesy of Burt Hill Kosar Rittelmann Associates

ergy-efficiency measures, like daylighting,
e up dollars that can be spent for learning.

Now is the time to make smart energy choices

A host of forces have combined in recent years to make now the time to ensure that your schools are smart about energy:

Growth in student population

Chances are high that your district is adding buildings, buses, or entire new schools to serve the many baby boomer children now reaching school age. If efficient, these new buildings and buses will free up your tax dollars for teacher salaries, improved security systems, and computers for years to come. If inefficient, your district will continue wasting huge sums on unnecessary utility bills.

Expanded school hours and community use

Your district may be one of those embracing the concept of "Schools as Centers of Community," hosting more non-student events during off hours and integrating more public facilities. Yours may also have adopted year-round schedules, which add to cooling bills during hot summer months. Efficient buildings help ensure that expanded hours don't break your budget.

Larger building size

If your district is like most today, it is adopting new technologies and educational approaches aimed at improving education. One unanticipated result may be larger buildings—and larger utility costs. Each computer in a classroom, for example, requires 50 percent more space than a traditional work area. Smaller class sizes, more one-on-one instruction, and greater numbers of specialized laboratories also require additional space, bigger buildings, and—potentially—higher utility costs.

More portable classrooms

Faced with a rapidly rising student population, many schools are employing portable—sometimes called "modular"—classrooms, which are faster and less expensive to construct. The bulk of them are also much less energy efficient than permanent buildings. Contact EnergySmart Schools for help in identifying portable classrooms that will cost you less to operate and provide better places for teaching and learning.

Deregulation of the electric utility industry

Deregulation of electric utilities allows (or will allow) schools and other building owners to choose their electricity supplier and negotiate for rates. These rates depend on many factors: your school's overall electricity demand, its pattern of electricity use throughout the day, and the predictability of its energy demand, among others. Schools that are smart about energy have more leverage in negotiating for the best rates.

Volatile bus fuel costs

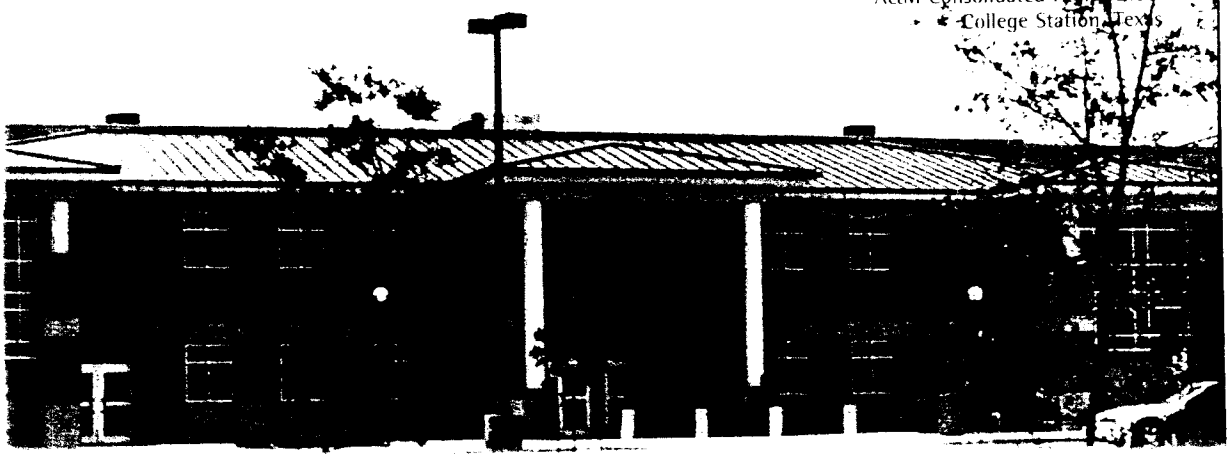
In the spring of 2000, school districts found out just how vulnerable their budgets can be to oil and gas price increases. Many fleets dependent on such fuels saw price increases of 30 cents per gallon or more—on buses that travel an average of 7,400 miles per year. Fleets powered by compressed natural gas and other domestically produced fuels were better able to maintain their budgets.

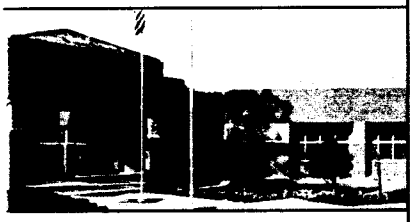
A view of success: College Station Independent Schools

District leverages energy to avoid salary cut, make capital improvements

The 7,200-student College Station Independent School District in Texas knows from experience how EnergySmart Schools can help. It faced a salary cut but instead found huge savings by joining the local community partnership—the Rebuild Brazos Valley Energy Conservation Coalition.

A&M Consolidated High School
College Station, Texas





For helpful resources or more information:

Call DOE's energy hotline: 1-800-DOE-3732

- *Ask a question about saving energy in your school or request information about the EnergySmart Schools campaign. You may want to inquire about the availability of the following EnergySmart Schools resources:*

Publications and videotapes

- *Design Guidelines for New Schools and Major Renovations*
- *Portable Classroom Guidelines*
- *Designing Smarter Schools, a 30-minute videotape that originally aired on the CNBC television network*
- *Educational CD-ROM featuring teaching and learning materials*
- *Energy Design Guidelines for Schools*

Services

- *Technical assistance*
- *Regional peer exchange forums*
- *State-based forums for school decision-makers*
- *Financing workshops*
- *Technology workshops*

Visit the EnergySmart Schools Web site

- *Get practical guidance for improving energy efficiency in schools*
- *Tap into resources for teaching and learning about energy*

www.eren.doe.gov/energysmartschools

U.S. Department of Energy

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Rebuild America

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