Reduce Operating Costs with an EnergySmart School Project

Energy costs are a school district's second highest expenditure after personnel. Public schools currently spend more than $8 billion per year for energy. School energy expenditures rose, on average, 20 percent per year between 2000 and 2002—and the costs continue to rise. Natural gas prices alone increased 14 percent annually between 2003 and 2006.

Improving a school's energy efficiency doesn't have to cost millions. In fact, schools can cut their energy expenses by 5 to 20 percent simply by efficiently managing and operating physical plants. This holds true regardless of the age of a school building.

School operations and maintenance (O&M) personnel are essential to the success of long-term energy strategies. *For new and renovated buildings, O&M staff can help make sure that energy-efficient strategies and technologies are part of the design. In existing schools–and the average age of a U.S. school is over 42 years–O&M personnel play an even greater role in managing ever-increasing energy costs.*

A smart O&M program can improve an existing school's energy performance

An O&M program can be a simple initiative or a comprehensive long-range program, but all O&M programs demand buy-in from key audiences–administration, faculty, O&M staff, teachers, students, and school district residents.

An O&M program makes everyone aware of the need for regular maintenance and smart energy policies. Develop a program with measurable objectives, educate the audiences about the program benefits, invite participation, and report progress regularly–and you'll develop support for O&M activities. O&M issues become important budget items, and the school's O&M personnel become partners in running an efficient school that meets community needs.

Basic program framework

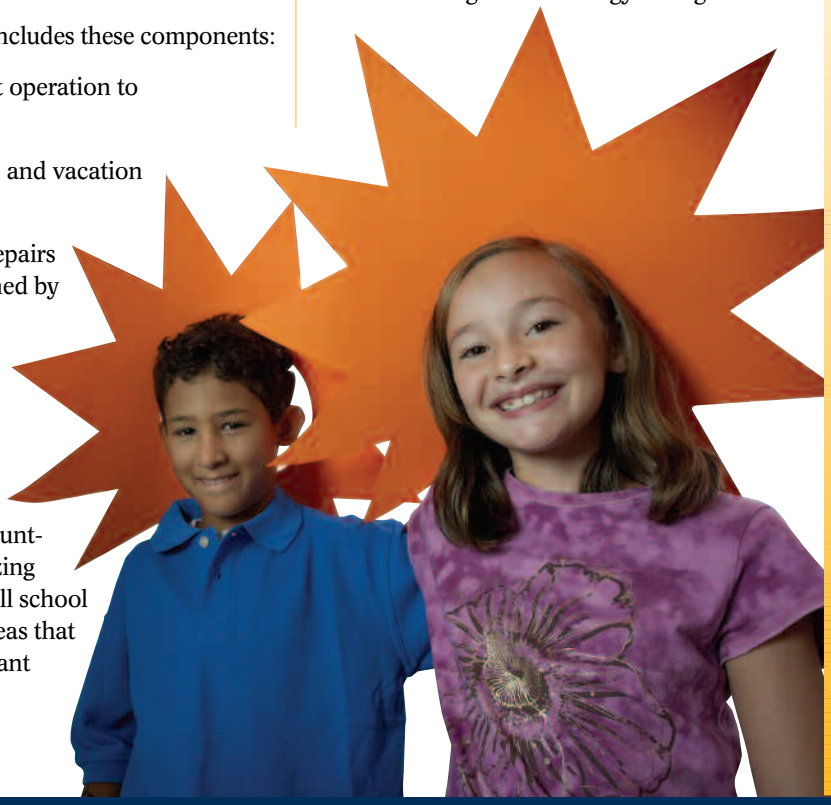
An O&M program usually includes these components:

- A plan to limit equipment operation to occupied hours
- A procedure for weekend and vacation shutdowns
- A program for low-cost repairs or improvements performed by in-house staff
- A schedule for regular maintenance procedures

Most O&M programs follow one of four tracks:

- Energy tracking and accounting–collecting and analyzing monthly energy costs in all school facilities help pinpoint areas that offer potential for significant savings.
- Voluntary energy awareness–increasing the general energy awareness of staff and students saves energy dollars at a modest cost.
- Performance contracting–specialists help schools generate energy savings through improvements/upgrades to existing energy systems. The energy savings generated fund the improvements, resulting in no impact on the budget. The cost and payback of this track range from low to high.
- Quick and low-cost strategies–O&M staff create facility use plans, maintenance and repair schedules, and similar programs. Costs and savings are low to moderate.

Some schools combine two or more of these tracks to create a program that is affordable and that delivers significant energy savings.



EnergySmart Schools

Design and retrofit with O&M as part of the team

New building and major renovation projects can start with energy-saving strategies when O&M personnel are part of the design phase. With planning and integrated design, energy-efficient projects cost no more than conventional projects–but an energy-efficient school costs much less to operate. Design and construction, however, are just part of the story; to deliver maximum savings, an energy-efficient school needs a comprehensive O&M plan implemented by a properly trained staff. See EnergySmart Schools' "How To Guides" at *www.energysmartschools.gov* for more details on planning, financing, designing, building, operating, and maintaining a high-performance school.

Getting started

Start with a needs-use assessment. Your local utility companies can help you get a handle on your school's monthly energy consumption. Another resource is the federal government's ENERGY STAR® program (*www.energystar.gov*), which helps schools track energy performance for individual buildings and groups of buildings. In addition, ENERGY STAR can tell you how your school's energy performance compares with similar schools across the country.

Additional resources include other school districts that have implemented an O&M program and nonprofit organizations, both local and national, that are devoted to energy efficiency.

Retrofitting existing facilities

These energy-saving steps require minimal capital investment and can produce paybacks in less than two years:

Lighting

Lighting strategies present the easiest opportunities to lower energy consumption without major expense.

- *Turning off lights in unoccupied rooms can save from 8 to 10 percent of lighting energy annually.*
- *Automatic lighting controls can generate significant energy savings with short payback periods.*
- *Switching from older T-12 lighting to T-8 lighting with electronic ballasts can reduce lighting energy by 20 to 30 percent.*
- *ENERGY STAR® light-emitting diode (LED) exit signs can last 25 years without lamp replacement. Compact fluorescent bulbs in exit signs typically last one year.*

Computers and office equipment

- *Computer monitors burn about two-thirds of the energy used by a computer system. The ENERGY STAR Power Management Program provides free software that automatically puts active monitors into a low-power sleep mode (2 to 10 watts).*
- *ENERGY STAR copiers can achieve energy savings of 40 percent compared to standard models.*
- *Individual printers should be turned off when not in use. Printers that must operate continuously can use an ENERGY STAR power-down feature, which can save $25 a year.*

Building envelope strategies

- *Close doors and windows when the heating/cooling system is operating.*
- *Make sure doors and windows close tightly.*
- *Check caulking and weather stripping for leaks.*

Heating, ventilating, and air conditioning (HVAC)

The HVAC system typically uses more than half of the energy consumed in school buildings.

- *Schedule regular maintenance on HVAC units: clean burners and air conditioner coils, clean/replace air filters, and check ducts and pipe insulation for damage.*
- *Have a qualified technician perform scheduled maintenance on the hot water boiler annually. This step alone can lower energy consumption by 10 to 20 percent, reduce emissions, and increase occupant comfort.*

Vending machines

Vending machines that operate continuously can cost anywhere from $200 to $350 annually.

- *Install energy-control devices to save as much as 47 percent annually. Some beverage wholesalers install these commercially available sensors in schools for free—ask your vendor if these sensors can be provided at no cost.*

For more information, contact:
Margo Appel
202-586-9495
www.energysmartschools.gov

U.S. Department of Energy
Energy Efficiency and Renewable Energy
Bringing you a prosperous future where energy is clean, abundant, reliable, and affordable

Endorsed by
NSBA
National School Boards Association