

Shades of Green

New Jersey schools are finding that green schools pay dividends beyond the bottom line

By PAUL NAPOLI



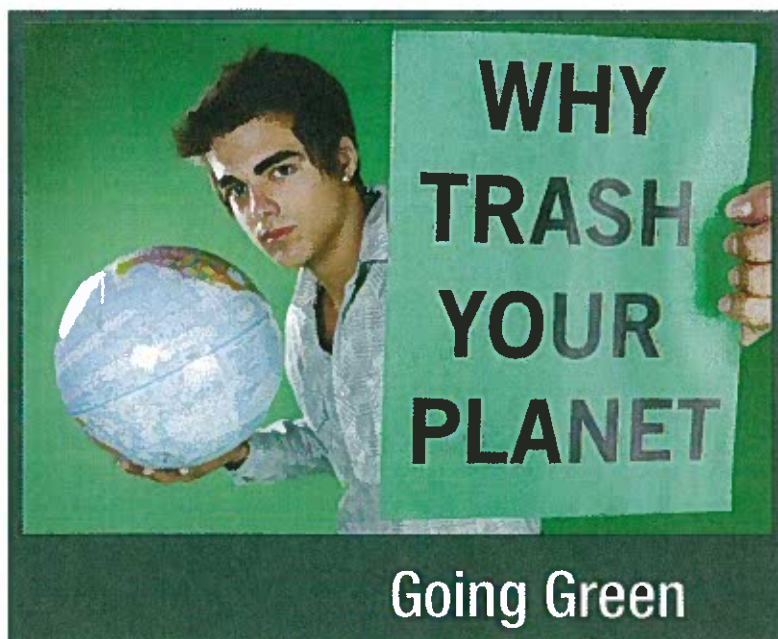
SCHOOL ADMINISTRATORS ACROSS America are learning the many benefits of going green, and New Jersey is no exception. Green schools – meaning those built or renovated using the most durable, energy-efficient equipment, systems and materials – are reaping rewards far beyond the bottom line.

Energy is one of the most important issues that we face today. On average, green schools use one-third less energy than conventional schools, thanks to innovative designs, advanced heating, cooling, ventilation and lighting equipment, and integrated systems to keep operations running at peak proficiency.

But green schools don't simply save energy and money. Learning is also enhanced. "Children's health is disproportionately affected by indoor pollutants, while light and air quality affects their capacity to learn and succeed," said S. Richard Fedrizzi, CEO of the U.S. Green Building Council. The recent report, *Greening America's Schools*, concluded that green schools can raise academic performance while improving the health, well-being and productivity for all who learn and work within them.

Today, 14 million children – more than a quarter of American students – attend school in buildings considered below standard or dangerous, according to the U.S. General Accounting Office, and almost two-thirds of schools have building features such as air conditioning that need extensive repair or replacements.

The concentration of pollutants indoors is typically higher than outdoors, sometimes by as much as 10 or even 100 times, according to *Greening America's Schools*. The health effects are dramatic. Substandard indoor-air systems exacerbate asthma symptoms as well as also contribute to the spread of a variety of respiratory ailments, such as colds and flu. That means more sick days among students, teachers and staff, and lower productivity when they're in the classroom.



Going Green

Here are tips for school board members and administrators interested in going green:

- Generate top-management support by adopting an environmental policy statement for your school. The statement can define both short- and long-term goals for achieving an environmentally friendly and sustainable building.
- Appoint someone who will “champion” the green school program. This person should be committed to helping “green” your school and be able to communicate that vision to everyone involved with the school.
- Start a “green team” of staff and students interested in identifying and brainstorming environmental-improvement ideas.
- Conduct a facility evaluation to assess current environmental conditions and identify areas for improvement. Look for areas where inadequate facilities impact student achievement.
- Use life cycle modeling software to analyze all of the key systems from a whole-building approach, rather than looking at each separate disparate technology as an independent part of the school’s infrastructure.
- Look at what has been done at other schools that have gone green and incorporate their best practices in your facilities.
- Create incentives, rewards or recognition for staff and students who take leadership roles in your school’s greening efforts.
- Track and report your progress. Examine the resources your school uses and what could be improved. Calculate and quantify the savings potential of your environmental efforts.
- Make your efforts long lasting by incorporating environmental improvement into core operations and curriculum.

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A Green Cure But green schools can help. A Carnegie Mellon review of two recent studies found an estimated 50 percent reduction in cold and flu infections in buildings with advanced ventilation systems and improved thermal control. And 70 percent of districts with green schools reported increased student attendance, according to Greening America’s Schools.

The 41-classroom Carlstadt Public School in Bergen County, which was dedicated in 2007, has achieved LEED Silver Certification via totaling 36 total points in the Green Building Rating System developed by the U.S. Green Building Council. LEED (Leadership in Energy and Environmental Design) provides a comprehensive tool for schools that set out to build green and want measurable results. The program encourages project teams to use an integrated design approach from start to finish. Eight out of the 36 points at the Carlstadt School were achieved in the area of Indoor Environmental Quality, confirming that the school has been built to high performance classroom standards incorporating improved temperature and humidity control for better indoor air quality. This translates to fewer sick days. The Carlstadt school district has also realized a 30% reduction in water and energy consumption for its efforts.

This environmental leadership has inspired the teachers and students, as well. Carlstadt students have a unique sense of pride that they are attending school in an environmentally sustainable building. The hope is that maximizing energy efficiency and seeking out renewable energy sources will become second nature to those students as they grow into adulthood.

Paying for Itself While the average school in America was built more than 40 years ago, upgrading now to green technology makes better financial sense in the long run. While green schools initially cost about \$3 more per square foot to build, the total financial benefits

are 20 times greater than the initial investment, according to the U.S. Green Building Council's report.

Reduced operational costs are a major reason and the potential savings is profound. If all construction and school renovations in America went "green" starting today, the energy savings alone would total \$20 billion over the next 10 years. And, as electric rates increase, the financial case for taking energy conservation measures becomes easier to justify due to a shortened payback period. Meanwhile, the larger the building and the larger the utility bill, the bigger payoff you get from high efficient equipment.

All new schools in the Vineland School District are using geothermal renewable energy systems. The geothermal system drastically lowers the schools' dependence on fossil fuel by using the constant temperature of the earth at a moderate 53 degrees Fahrenheit throughout the year as the primary source of energy for heating, cooling, and domestic pre-heating hot water production. "The geothermal system is the most energy efficient and environmentally acceptable of all the systems we analyzed," says Mike Fischette, P.E. and corporate principal at Concord Engineering Group. "It has a life cycle cost that is more than two and a half million dollars less than a four pipe boiler/chiller system."

Easy and Flexible Comfort In order to keep teachers and students focused, classrooms need to be kept at a moderate temperature. There are many elements that can change the temperature in a room. The number of people in the room, time of day, and amount of sunlight, are just a few examples. As these conditions change throughout the day, the more responsive system will keep the room at an acceptable level. Digital control systems are a very effective tool for managing these hourly changes in the classroom environment and minimizing energy consumption

A simple solution, such as wireless temperature sensors, can significantly lower

energy consumption. Some of the school districts in New Jersey which have implemented wireless technology include Millstone, Eatontown, Verona, Perth Amboy, and Clinton. By placing the sensor in a location that is in close proximity to where the students actually sit, versus the typical wired scenario which is usually near the door because of standard wiring schemes and installation procedures, the wireless sensors provide improved comfort and indoor air quality conditions. In terms of the overall environment, wireless sensors use fewer construction materials like conduit, wire, and connectors, because they eliminate the physical connection between the building automation controller and the sensing device. These wireless zone sensors also use less electrical power due to the fact that they use standard AA lithium batteries that last for a minimum of 5 years. For example, the Clinton Middle School, in Clinton, N.J., has more than 110 wireless zone sensors throughout the building. If, in years to come, there are changes in curriculum and classroom space usage, the sensors can simply be picked up and moved to a more suitable location within the classroom. It is an extremely flexible solution.

Green design is good design. It is the right thing to do for the environment, the teachers, the students, and the taxpayers. It is not just about saving energy and money. It is about making schools healthier and improving the learning environment so that students are better prepared for the future. sl

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USGBC website dedicated to
green schools:

www.buildgreenschools.org

If all
construction
and school
renovations
in America
went "green"
starting today,
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