

# EnergySmart Update

Weatherization and Intergovernmental Program

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## Energy Smart Awards Honor Energy Leaders

Outstanding achievers from Hawaii, Minnesota, Nebraska and North Carolina were honored May 12 with Energy Smart America 2004 Awards at a conference sponsored by the U.S. Department of Energy. Awards were bestowed for leadership, partnership and innovation at the Opening Plenary of the Energy Smart America 2004 conference in Minneapolis May 12.

### Ann Selzer

One of the two Leadership awards was given to Ann Selzer of the Nebraska Energy Office. She was asked to participate in pilot tests for Grants.gov, the new on-line system for federal grants that is being rolled out by the U.S. Department of Energy. Grants.gov will provide the mechanism by which state offices find grant opportunities and apply for grants. Because many of Ann Selzer's

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Gov. Tim Pawlenty addresses the Opening Plenary of Energy Smart America 2004.

## EERE Conference Blends Energy Visions and Details

More than 400 visitors to Minneapolis May 11-14 heard much about renewable fuels, flexible fuel vehicles and efficiency in buildings at Energy Smart America 2004, a conference that drew on the expertise of officials and project managers from dozens of states.

The Office of Energy Efficiency and Renewable Energy (EERE) of the U.S. Department of Energy staged the conference, which drew participants from nearly every state and three U.S. territories, most of them connected to either Rebuild America or the State Energy Program. There were big-picture visions and an array of sessions that went into close-up detail on technologies that can be adapted around the country.

Minnesota Gov. Tim Pawlenty, speaking at the Opening Plenary, stressed the value of renewable sources, notably Minnesota's agricultural products and wind energy. He also suggested that the general public probably does not hear as much as it should about energy efficiency.

Ellen D. Lutz, acting program manager of EERE's Office of Weatherization and Intergovernmental Program, noted that EERE is retooling itself to achieve a greater degree of agility.

"We are very jealous," she said to an audience that included many state and local officials. "At the federal level we are not as agile and flexible as you are."

She also offered an overarching image of what it means to be energy smart: integrating many diverse technologies and practices; not being held captive by traditions; having the vision to work toward such goals as zero-energy buildings and inexhaustible energy sources; and being able to look your

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U.S. Department of Energy  
**Energy Efficiency  
and Renewable Energy**

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

# Hawaii Tests Outdoor LEDs with Renewables

The City and County of Honolulu is home to 892,000 residents, and its roadways are illuminated by more than 45,000 street lamps, consisting of high- and low-pressure sodium lights. “Both have mercury and require expensive disposal,” notes Steve Holmes with Sustainable Honolulu. The city is exploring ways to incorporate renewable technologies to make lighting streets and parking lots more efficient, with less impact on the environment.



Bob Manes, left, of MoonCell Inc., shows Honolulu Mayor Jeremy Harris an LED streetlight that draws power from solar and wind energy.

To illuminate the parking lot at the Hanauma Bay Nature Preserve, the city installed LED (light-emitting diode) streetlights powered by two batteries charged by a solar panel and small wind turbine attached to the fixture. The luminaire is produced by MoonCell Inc., of Stafford, VA.

“The LED lights have an estimated 100,000-hour service life and would save bulb change-out costs and have no mercury,” explains Holmes.

Although the fixtures were designed for use in parking lots and driveways, the city asked scientists at Lawrence Berkeley National Laboratory (LBNL) to test the streetlight to determine whether it produces enough light to meet the Illuminating Engineering Society of North America’s (IES) guidelines for residential roadways. “The LBNL testing was done as a result of our Rebuild America partnership,” says Holmes.

The tests determined that the LED streetlights would need to be spaced 12 feet apart on a typical two-lane street to meet lighting standards, whereas high-pressure sodium

(HPS) streetlights could be spaced 100 feet apart. “The prototype LED luminaire would clearly increase luminaire and pole costs,” according to the study.

Although the LED streetlights used in Honolulu have several advantages – they contain no mercury, reduce light pollution, are self-powered and last about 60,000 hours longer than HPS luminaires – the technology is not quite ready for residential or larger roadways. “LED luminaires are more likely to be cost-effective on pedestrian walkways or bikeways,” the report concluded. The technology could be used for places such as parking lots and parks because the lighting levels as defined by IES for those types of settings are lower than for areas with higher population density, says Steve Johnson, LBNL’s Lighting Group Leader.

Although the product is more expensive than traditional streetlights, it also could be cost-effective for areas with little or no access to the electricity grid.

Last fall, the U.S. Department of Energy conducted its first workshop as part of an initiative to partner with industry, academia and trade groups to advance solid state lighting technology for general illumination uses.

“Streetlights are a big cost item for cities, and the savings nationwide would be enormous if a solid state solution could be found,” says Holmes.

For more information, contact Steve Holmes, program manager for Sustainable Honolulu, at [sholmes@co.honolulu.hi.us](mailto:sholmes@co.honolulu.hi.us) or visit [www.mooncell.com](http://www.mooncell.com).

## Efficient Traffic Signals

Many Rebuild America partnerships are reducing energy on roadways by retrofitting traffic signals. Replacement LED traffic lights use up to 90 percent less energy than incandescent lights. The efficient lights also last years longer, which reduces maintenance cost and time.

The City of Medford, MA, retrofitted its traffic signals with LED lights, and because the lights use so little electricity, the city was able to install a back-up power system. Photovoltaic panels charge battery packs, which supply power to the traffic signals in the event of a blackout. This system ensures continuous operation, making for a safer community.

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## ESA Awards

recommendations were acted upon, she will leave a lasting mark on the system.

### Hawaiian Partnership

The Partnership award went to State of Hawaii Rebuild America Program. Behind the program are the state's Department of Business, Economic Development, and Tourism; its Department of Education; its Department of Accounting and General Services; the University of Hawaii School of Architecture; and Hawaii Electric Co. Inc. Other partners include national groups and the U.S. Department of Energy. The Hawaiian program has launched statewide retrofit programs and high-performance design standards for schools.

### SEE Program

The Innovation award went to the Schools for Energy Efficiency (SEE) Program, created by Hallberg Engineering Inc., a company based in White Bear Lake, MN. The program works now with about 170 schools. Each school district in the SEE program is convinced to hire an energy coordinator to manage and champion the efficiency efforts. The program's target for each participant is a 10 percent reduction in energy usage. The goal is being met and often exceeded.

### North Carolina Energy Office

One of the two Leadership awards was given to the State Energy Office of the North Carolina Department of Administration. The office currently manages more than 80 projects. For state facilities and universities, the office established the Utility Savings Initiative, which identified \$6 million in low-cost and no-cost savings per year. That may produce savings of \$25 million if replicated in all state square footage. Among many other tasks, the office is in charge of rolling out a new \$50 million performance contracting program for state agencies and universities.



Ann Selzer, left, receives award from DOE's Ellen Lutz.

## View From DC

by Daniel Sze

There is an obvious logic to the way many people tackle a program of building improvements – first the quick-payback retrofits, then the tougher stuff. Money saved through the first improvements can be used to help finance the later changes. That much is common sense, a strategy of picking the low apples first.

But another stage should not be neglected – the longest-range stage, the testing and learning that can bring radical change. While we do the incremental work of improving energy efficiency in existing buildings and applying the best design standards to new ones, we also need to be looking for technologies that will profoundly transform markets. If you never swing for the fences, you never hit home runs.

That is the logic of research on hydrogen and biomass.

Many engineers, aware of the long history of frustration behind efforts to make hydrogen a common fuel, can be forgiven for their skepticism. But it would be unwise to give up. Different methods of hydrogen production keep coming under scrutiny. Water can be separated into its constituent hydrogen and oxygen when subjected to energy from inexhaustible sources – the sun and wind. There is research with bacteria that give off hydrogen from metabolic activity. Other approaches will be tried, and with enough ingenuity we may turn the “fuel of the future” into the fuel of the present.

To move us a step closer to that day, Rebuild America and local partnership Rebuild Sarasota County joined with state officials to get a working fuel cell installed in North Port High School in Florida. You can read a story about it in this newsletter. The device not only allows for research, it allows the school's students to engage in hands-on science studies. Maybe one of those students will turn out to be the clever inventor who figures out how to make hydrogen a practical substitute for fossil fuel.

At the Energy Smart America 2004 conference in Minneapolis in mid-May, some sessions focused on biomass fuels. The audience was composed not of high school students but decision-makers from state and local governments and the private sector. Maybe some of those conference attendees will be the ones who spearhead projects that overcome the barriers to biomass fuels.

It can happen. Every now and then, home runs are hit.

*Dan Sze is National Program Manager of Rebuild America. Your comments are always welcome at [danielsze@rebuild.org](mailto:danielsze@rebuild.org).*

# People and Technology Help Albuquerque Schools

**A**lbuquerque, New Mexico's largest city, also has one of the largest U.S. school systems. Partly to cope with the burden of costs, it has put together a well-rounded energy-efficiency program, its annual savings approaching \$1 million and still growing.

The school system has about 90,000 students and 11,000 teachers and other staff in 127 schools and 10 administrative facilities. Annual expenditures include about \$7.3 million for electricity and \$2.5 million for natural gas. Amid such large numbers, there are possibilities for large savings.

To begin to capture those large savings, knowledgeable people are needed. David Robertson, the staff engineer for the Department of Facilities Planning and Construction, has been a primary strategist for the school system's changes. About four years ago, he was joined by Ron Rioux, who spearheads the behavior modification program that uses financial incentives for participating schools.

Rebuild America, including local partnership Rebuild New Mexico, has been supportive. And it was at a Rebuild America peer exchange in Denver that Robertson first got the idea for an incentive program.

## Rewards and Refinements

The Jordan School District, a Rebuild America community partner in Utah, rebates a portion of energy savings back to schools, Robertson learned. In his effort to set up a similar program and to have Rioux hired to run it, Robertson found two influential allies who had experience in energy issues – his school system's assistant superintendent for facilities, and the director of the Facilities Master Plan. Enough initial funds were provided for a half-year trial, after which the program earned on-going support.

A third of the energy savings in a school is rebated to the individual school's budget for any use, a third goes to the school's maintenance and operations budget, where it is earmarked for energy efficiency, and a third is added to funds that Rioux can spend on energy efficiency and energy education.

"It's really neat watching the teachers and the kids getting excited – delivering the checks, seeing



*Vans equipped for demonstrating solar and wind energy, during a visit to Albuquerque from the National Renewable Energy Laboratory.*

their faces," says Rioux, who makes a little ceremony out of the rebate checks that each school gets. "They can't fathom that there's that much waste there."

One of the refinements learned: Provide the incentive checks quarterly, not annually. People can lose interest if they lose sight of the benefits of what they are doing.

Another refinement: Make sure each school has an HVAC (heating, ventilation and air conditioning) technician coached to have an eye for energy conservation.

A third refinement: To maintain the enthusiasm of staff and students, keep it simple. Albuquerque uses the 2000-01 school year as the base year for comparisons, multiplying kilowatt hours of consumption by the current dollar value of electricity to get quarterly and annual totals. The only adjustment comes from changes in square footage, such as when a school gets a new building.

The behavior modification program, involving students, teachers and other staff, has reached an annual savings level of about \$310,000.

## Technology Projects

Three of the primary technology projects include: conversions of refrigerated air-cooling systems to evaporative cooling; addition of timed control devices to HVAC systems and exterior lighting systems; and lighting retrofits.

Time clocks have been added to HVAC systems to scale back heating and cooling near the end of a day and to crank up the heating again the next morning before teachers and students arrive.



*Students patrol to reduce waste.*

Spring-wound timer switches, or “twist timers,” also have been added to HVAC systems. In smaller buildings and especially in portable classrooms, a teacher or other staffer can turn on the heating or cooling, with a maximum of four hours allowed before the spring-wound control winds down and cuts off. The occupant can then turn it on again, for as much as four hours again, to complete a typical eight-hour day. Such a timer also can be used in a subsection of a large building when someone comes to work at an unusual time.

Lighting is another technology undergoing retrofits in Albuquerque. T-12 fluorescent lights and magnetic ballasts are being replaced with T-8s and electronic ballasts. In some rooms – usually not classrooms – occupancy sensors are added.

Motion sensors or in some cases simple digital timers have been connected to vending machine controls to minimize waste of electricity. The controls using motion sensors are the VendingMiser devices of USA Technologies, a Rebuild America Business Partner.

At close to \$1 million, the annual savings from retrofits and behavioral changes amount to about 10 percent of electricity and gas expenses. Robertson sees no reason why savings can't reach 20 percent or even 30 percent. He notes that lighting retrofit work has a long way to go, with only 15-20 percent of the changeovers completed. For time clocks and twist timers, maybe a third of the furnaces have been given the controls. The behavior modification program has reached only 42 of 127 schools.

For more information, contact Julie Stephens, Rebuild New Mexico, 505-768-5346, email [RebuildNMjulie@aol.com](mailto:RebuildNMjulie@aol.com).

## Energy CD Honored

The National Association of Government Communicators presented a 2003 Gold Screen Award to the U.S. Department of Energy (DOE) *Get Smart About Energy* compact disk. *Get Smart About Energy* is a teaching tool that contains over 250 classroom activities for K-12 students about energy, energy efficiency and renewable energy. These activities are aligned with National Science Education Standards and can easily be aligned with state and local guidelines. Since its inception in 2001, the CD has enabled DOE's EnergySmart Schools to be an energy education provider in over 70,000 classrooms.

For more information, contact Margo Appel, EnergySmart Schools, 202-586-9495, email [margo.appel@ee.doe.gov](mailto:margo.appel@ee.doe.gov).

## A Letter from Iraq

*[Editor's Note: Carla Clemons of the U.S. Department of Energy's Midwest Regional Office addressed Energy Smart America 2004 attendees in Minneapolis, MN, from Iraq. A letter from her was read aloud at the Opening Plenary.]*

Here I am, thousands of miles from the Midwest, on detail to DOD, in the middle of a war torn, deprived country whose infrastructure is 25 years behind any first world country, and still he does it. Peter Dreyfuss has reached out and assigned me a fire drill – write a one pager for the Energy Smart America 2004 Conference! How does he do it! I don't know.

In all seriousness, I appreciate the opportunity to send you greetings and let you know I'm thinking of you today...

When I first came to Iraq, I feared my talents would be insufficient. What could I possibly bring to this country, the cradle of civilization, which could make a difference? The truth is I was very well prepared to work here because, in large part, of the partnerships and friendships we have cultivated together.

My current focus is on building the electrical infrastructure of Iraq. However, I am employing the same strategies that we use to implement EERE activities. For example, we facilitate and support partnerships, we establish and build trust and confidence, we find and mentor champions; we build internal capacity; we find ways to effectively communicate; we take the time to really learn about what the needs are; we recognize the capabilities of individuals and respect their skills, culture, and point of reference; and we look for ways to leverage resources.

These are the strategies we use. These are the strategies that work. These are the strategies that you have developed and continue to perfect. I applaud you and look at you in a new light, not only as local, state, or regional experts, but also as world-class experts. The fact is, the best practices that you have developed are being effectively adopted and utilized here in Iraq.

I really encourage you to make the absolute most of your time at the Energy Smart America 2004 conference; it is a unique and wonderful opportunity to learn from the world's best experts about what works, what doesn't, how do it, and who can help.

In closing, I want to express my gratitude to my colleagues at the Chicago Regional Office for taking over my responsibilities in my absence, especially John Devine, Steve Palmeri, Kirk Bond, and Linda King. I also want to thank Peter for the opportunity to be with you today as well.

Sincerely,  
Carla Clemons



From left: Jen Peterson, Janet Streff, Ellen D. Lutz, Gov. Tim Pawlenty, Peter Dreyfuss, Dan Sze, Ron Santoro.

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## 2004 Conference

children in the eye and know that you are bequeathing to them a world they will want to inherit.

The Opening Plenary also heard from Peter Dreyfuss, director of the EERE Midwest Regional Office; Dan Sze, national program manager of Rebuild America; Ron Santoro, team lead of the State Energy Program; and Janet Streff, director of the Minnesota State Energy Office. Throughout the conference, there was a substantial contingent from the Minnesota Department of Commerce, including Streff, Jen Peterson, Bruce Nelson and others.

Jack McGowan, president of Energy Control Inc., offered a forecast of how internet and wireless technologies will transform energy-saving practices and operations in buildings. Web sites and wireless networks will allow organizations to share real-time data with anyone, at any place, he said. Web-based control will allow people to manage energy consumption much more efficiently with such a flow of data.

### Diving into Details

Teamwork across organizational lines was a subject that came up in various sessions. John Giglio, executive director of the National Association of State Energy Officials, recommended that state environmental and energy officials become more aware of each other. State officials hoping to promote high-performance school buildings should work with the state representatives of the National School Boards Association (NSBA), said C.H. “Sonny” Savoie of NSBA.

There were detailed sessions on the value and pitfalls of building codes, state energy legislation and energy-efficiency incentive programs. Technology-oriented sessions addressed such subjects as cogeneration (combined heat and power), idle-reduction solutions for diesel trucks, and fuel cells for buildings.

Vehicles were prominent at the conference. Buses for tours and events ran on biodiesel, made from a blend of conventional diesel and soybean oil. A flexible-fuel Ford Taurus SES was on display to give people a look at a car that can run on conventional gasoline or an ethanol-blended



Ford Taurus SES, able to run on gasoline or ethanol, on display in the Hilton Minneapolis.



*St. Paul Energy Tour at the Science Museum of Minnesota.*



*DOE's Peter Dreyfuss with the Energy Hog.*

gasoline. The car advertised E85 fuel – 85 percent ethanol, 15 percent petroleum gasoline.

The connection between energy efficiency and pollution control was emphasized throughout the conference, from Pawlenty's remarks to the concluding presentation of Thomas E. Lovejoy, who focused largely on the subject of global warming.

Matthew Brown, director of the energy program for the National Conference of State Legislatures, pointed out that legislation and regulation increasingly interweave policies on air pollution and energy efficiency. Some states, such as New

Hampshire, have started to give pollution allowances to companies with installed efficiency measures.

The Energy Systems Laboratory at Texas A&M University has been developing a calculator for air emissions reductions from energy efficiency, said Dub Taylor, director of the Texas State Energy Conservation Office. Plug in a zip code and a quantity for reduced electricity consumption, and the Texas A&M program will estimate emissions savings. The zip code allows the program to take account of the specific mix of power production – and consequently the emissions from power production – connected to the area where the energy consumption change occurred.

## Touring Energy Sites

Conference tours explored the Minneapolis and St. Paul areas. The St. Paul energy tour, for example, took people to an advanced district energy system that uses a wide array of energy sources to produce hot water for heating and chilled water for cooling. An adjoining plant uses wood waste to fuel a combined heat and power facility.

Financial supporters of the conference were led by Siemens and Johnson Controls. Others included the Minnesota Soybean Research and Promotion Council, OSRAM SYLVANIA, Savastat-USA, United Soybean Board, Verdiem Corp. and York International Corp. Playing host was the Minnesota Department of Commerce.

For more information, visit the conference Web site, [www.energysmartamerica.org](http://www.energysmartamerica.org), where conference presentations will be posted.



*Bus running on biodiesel, a fuel made partly from soybean oil, carried conference participants.*

# New Chapter on Cooling for University's Library

**A**n operational change last year for the main library at the University of Nevada, Las Vegas (UNLV) was the extra bit of fine-tuning that the structure needed. With a different approach to air conditioning for the building, the campus facilities staff is saving the university about \$21,000 a year.

The change indicates what can be accomplished even in a relatively new building that is considered state of the art.

In southern Nevada, air conditioning is essential to control heat that routinely tops 105 degrees F in the summer. But air conditioning can excessively cool some rooms, because the air leaves the air handlers at 55F and warms only gradually as it moves along ducts and through rooms. The rooms closest to the air handlers can be uncomfortably cool while others are just fine.

The Lied Library, a five-story, 301,600-square foot building, was completed and opened in 2001. The original operational plan for the library was to run boilers during the summer to prevent some rooms from being too cool. It had been estimated that this solution would be less expensive than increasing the horsepower to fans to distribute the cool air more evenly. But the library was running its natural gas bill up tremendously.

UNLV, a Rebuild America community partner, decided to make use of the expertise of a national energy laboratory. In July 2003, Pacific Northwest National Laboratory studied the library and concluded that the operational plan was based on incorrect estimates of the energy demand of the boilers versus the fans. It would be better to turn off the boilers and increase the speed of the fans, the study indicated.

"Last summer we turned off the boilers, and nobody complained about comfort," says Jim Wilhelm, assistant director for energy management at UNLV.

While comfort remained the same, energy consumption dropped. The university estimates it will

save more than \$20,000 a year because of that zero-cost change.

Rebuild America helped UNLV avoid another energy drain. In that case, the idea was to try combined heat and power to warm the campus swimming pool while generating electricity. Oak Ridge National Laboratory studied the plan and concluded that it would not be a good one.

## Campus Metering

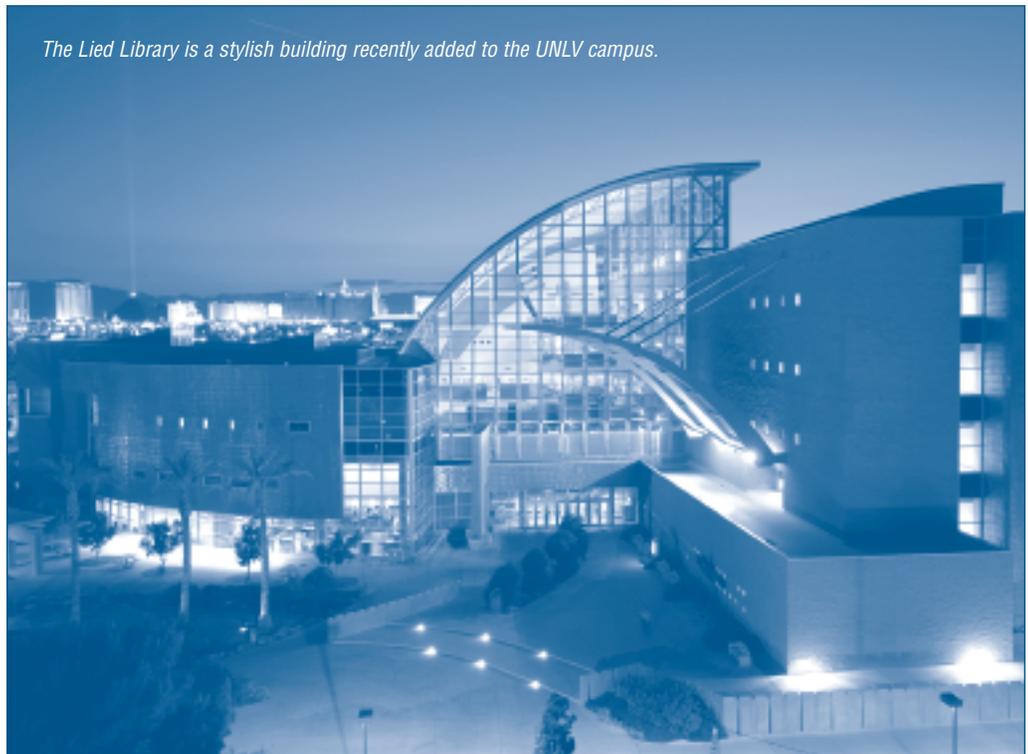
The savings from the Lied Library change will contribute to a campus metering project. UNLV is using that money and other energy-efficiency savings to buy meters for most campus buildings. The meters will provide real-time energy consumption and trend data on each building, allowing university staff to make better decisions on what changes may be needed. "Monitoring is an informational tool, an ability to identify potential problems," Wilhelm says.

The meter data will be accessible from computers around campus, so that not only staff but building occupants will be able to see the information and take a greater interest in efficiency.

For more information, contact Ken Baker, customer service coordinator, 208-861-5736, email [kbaker1@mindspring.com](mailto:kbaker1@mindspring.com).

John Litty / UNLV

*The Lied Library is a stylish building recently added to the UNLV campus.*



# University Center Saves Energy and Adds Service

Nearly 20,000 people pass through Southern Illinois University Carbondale's student center every day. To help reduce utility costs without compromising services, the student center turned to energy smart technologies and practices.

"We run the student center like a business," says Ken Jaros, student center associate director of operations and maintenance. The student center is not funded by the state, but relies on student fees and sales – from the bookstore, food vendors and meeting space rentals. Reducing energy costs helps the bottom line.

## Rebuild Carbondale

As a partner of Rebuild Carbondale, the student center taps into expert advice and resources for many of its energy-efficiency projects. Rebuild Carbondale provides energy audits, technical advice and financial assistance to help schools, businesses, health care facilities and other organizations save energy, explains Dr. Manohar Kulkarni, P.E., professor in the Department of Mechanical Engineering and Energy Processes.

Nearly 100 incandescent exit signs in the student center were replaced with highly efficient LED (light-emitting diode) fixtures. LED exit signs can last up to 40 times longer

than incandescent signs while using about one-eighth the electricity. The payback period was only nine months.

The student center also replaced 360 incandescent down-light fixtures with fluorescent lamps in the dimly lit first floor corridor. The horizontally mounted fixtures, with built-in reflectors, increased the amount of light while using less electricity. The new lights produce less heat than incandescent bulbs, which helps reduce the building's cooling load.

The facilities department also cleaned and calibrated building controls, thermostats and steam traps to ensure they work properly. In addition to saving energy, the changes increased occupant comfort throughout the building.

The student center recently replaced an 18-year-old, 20-ton rooftop air conditioning unit with a smaller, more efficient unit. The unit features an integrated economizer which saves energy by detecting when it should run on economy mode or full blast.

## Email, Computers, ATMs...

By using off-the-shelf technologies and best practices, the student center saves energy without sacrificing comfort or services. The student center has saved \$1.4 million over 13 years despite the addition of public email machines, more personal computers and ATMs, and expanded food services.

The savings from the energy retrofits will be used for further improvements to the building. "Our past practices have been that the energy dollars saved from a project will cover the cost of the next energy-efficiency project, thereby continually reinforcing our efforts," says Jaros.

For more information, contact Ken Jaros at [kjaros@siu.edu](mailto:kjaros@siu.edu), or Dr. Manohar Kulkarni, P.E., at [kulkarni@siu.edu](mailto:kulkarni@siu.edu).

## Financial Incentives

The January-February issue of *EnergySmart Update* included an overview of financial incentives for energy efficiency, renewable energy and distributed generation. The incentives come from utilities and government. Here is another useful database for learning about incentives around the country: [www.simplyinsulate.org](http://www.simplyinsulate.org).

The Web site is funded by the North American Insulation Manufacturers Association ([www.naima.org](http://www.naima.org)) and managed by the North Carolina Solar Center at North Carolina State University. It is updated at least once annually.

### Rebuild America Progress Calculator

Number of Partnerships:  
**680**

Total Number of Committed or  
Completed Square Feet:  
**1,505,086,180**

as of May 25, 2004

### Premier Business Partners

Acuity Brands Lighting	Sarnafil US Inc.
Earth Protection Services	Siemens Building Technologies Inc.
EnLink Geoenergy Services	Sun Energy Solutions
GE Lighting North America	TRACO
Johnson Controls	Trane
McQuay International	The Watt Stopper
NORESO	
OSRAM SYLVANIA	

## School Gets Fuel Cell, Hydrogen Study Plans

**A** Sarasota County high school in Florida has become the first school to have a fuel cell in combination with the hydrogen educational materials and activity plans developed by the U.S. Department of Energy (DOE).

The fuel cell will supplement the school's electrical power, but its primary purposes are to serve as a research tool and to be used in science education.

"Just like the students of North Port High School, hydrogen is the future," said David Garman, assistant secretary for energy efficiency and renewable energy, at the unveiling of the fuel cell in April. "Seeing cutting-edge technology up close is good for students and teachers, but having the chance to work with it hands-on is exciting."

Capable of producing up to 5 kilowatts, the fuel cell also provides an example of combined heat and power. The fuel cell's heat will be used to warm kitchen water, and the device's water – formed when hydrogen and oxygen combine inside it – will be used for landscaping.

Electric and gas utility Florida Power & Light installed the fuel cell and will monitor it and provide data to the state Department of Environmental Protection, which includes the state energy office. The fuel cell will be in place for one year.

Fuel cells are a rarity in any school. The first fuel cell in a U.S. school reportedly was installed only four years ago.

Local, state and federal programs collaborated in the project. The county, which is a Rebuild America community partner, has been actively promoting energy efficiency and alternative energy. Sarasota County Public Schools also has become a community partner. DOE chose North Port for one of a series of classroom visits by DOE officials to raise awareness about hydrogen and fuel cells. DOE also supplied the school with an educational compact disk containing information and plans for classroom activities.

The Florida Energy Office provided a Plug Power fuel cell. Florida State Rep. Jerry Paul was a driving force for the installation. The legislator is trained in nuclear engineering, comes from a town near Sarasota County and has a strong interest in energy issues, including the promotion of alternative energy.

For more information, contact Nina Powers, Rebuild Sarasota County, email [npowers@scgov.net](mailto:npowers@scgov.net).

## Upcoming Events

### July

**19-22** **2004 National Workshop on State Building Energy Codes**, presented by DOE's Building Energy Codes Program. Hyatt Regency Philadelphia at Penn's Landing, Philadelphia, PA. Contact Norma Sandoval at 509-375-2116 or email [norma.sandoval@pnl.gov](mailto:norma.sandoval@pnl.gov).

**20-23** **Engineering Green Buildings**, presented by *HPAC Engineering* magazine. Marriott Key Center, Cleveland, Ohio. Contact Kathy Lambrix at 216-931-9575.

**23-25** **SolWest Renewable Energy Fair**, presented by the Eastern Oregon Renewable Energies Association. Grant County Fairgrounds, John Day, OR. Visit [www.solwest.org](http://www.solwest.org).

### August

**8-11** **Energy 2004**, presented by DOE's Federal Energy Management Program. Rochester Riverside Convention Center, Rochester, NY. Visit [www.energy2004.ee.doe.gov](http://www.energy2004.ee.doe.gov).

**11** **Building Retail Sales: Effective Merchandising & Customer Comfort**, presented by Nevada Small Business Development Center, Nevada State Office of Energy and Rebuild America. Sierra Pacific Power Auditorium, Reno, NV. Call 1-866-638-7232 or email [registration@nsbdcnep.org](mailto:registration@nsbdcnep.org).

**12** **Building Retail Sales: Effective Merchandising & Customer Comfort**, presented by Nevada Small Business Development Center, Nevada State Office of Energy and Rebuild America. Henderson Convention Center, Henderson, NV. Call 1-866-638-7232 or email [registration@nsbdcnep.org](mailto:registration@nsbdcnep.org).

**29-Sept. 3** **World Renewable Energy Congress VIII and Expo**, presented by the National Renewable Energy Laboratory. Denver Marriott City Center, Denver, CO. Contact Robert Noun at 303-275-3062 or email [bob\\_noun@nrel.gov](mailto:bob_noun@nrel.gov).

*Visit the Events page in the Rebuild America Web site to read about or post other events. You can also keep up on events and provide event listings through the Flash Report, with subscriptions available via the Web site's News page.*

## TECHNOLOGY

# Don't Waste Warm Air on Indoor Upper Altitudes

In many commercial facilities and workshops, heating devices labor to keep workers and customers comfortable at floor level while warm air rises and wastefully overheats upper levels, especially in rooms with very high ceilings. The stratified air can leave a lower level too cool and an upper level too warm while allowing utility bills to float upward, too. A solution is to circulate warm air back to the floor level from the ceiling.

Ceiling fans, ducts connected to fans, and free-hanging blowers are three basic options for recirculating air to achieve thermal destratification. If it's done right, it can reduce heating requirements by 15 percent to as much as 50 percent, with a payback period as short as two years, according to Jack Matzer of Avedon Development LLC, a Rebuild America Business Partner.

The options are outlined in a presentation Matzer put together for Rebuild America. He draws on analyses and reports from the U.S. Department of Energy, Kansas State University, Rutgers University and others for the PowerPoint presentation.

The appropriate places for destratifying air can include such buildings as big-box retail stores, multistory workshops, indoor malls, gymnasiums, auditoriums and temperature-controlled warehouses. The best HVAC (heating, ventilation and air conditioning) systems will prevent the problem, but many buildings new and old have imperfect HVAC systems.

One Rebuild America partnership, in Kewanee, IL, helped destratify air in a printing plant. The plant had screen-printing equipment and workers on a ground floor, where it often was too cool. Heat rose easily to the second floor of the building. A retrofit, involving installation of flexible ducts connected to fans, allowed the company to channel heat back down and save money on utility bills.

Thermal stratification can cause problems during the summer, too. Areas close to the outlets of air conditioners can be uncomfortably cool while areas farther from the cooling units – higher up within a multistory space – are just cool enough.

Ceiling fans stir the air but do a very incomplete job of destratification. They reduce the need for heating, but not by much, and they create drafts. "It should be obvious that they just don't do it," says Matzer.

Ducts connected to smaller fans can provide the most complete destratification, with significant reductions in energy consumption. Their drawbacks: plastic ducts descending from the ceiling can be obstacles and unsightly.

Free-hanging blowers also can provide a high degree of

destratification. Suspended from a metal beam or other anchoring point, they can direct a stream of air to the floor.

Avedon Development is pioneering the market for free-hanging destratification equipment. A spin-off of Avedon Engineering based in Longmont, CO, the company is working on proving the value of its Airius Thermal Equalizer, a quiet air turbine that can blow a column of air back down to the floor.

Avedon is developing a record of the equipment's effectiveness in its own 45,000-square-foot headquarters building. That building includes 24,000 square feet of two-story offices and operations-related rooms such as workshops and storage, which are the types of spaces that can benefit from thermal destratification.

For more information, contact Jack Matzer, Avedon Development, cell phone 303-875-1259.

## Web Site Update

The Solution Center in the Rebuild America Web site has more than 255 resources and counting. If you have any relevant resources you would like posted to the Web site, send them to the program for review. Recent additions to the Solution Center are:

**High Bay Lighting: It's All in the Details** – an article on various aspects of the design of high bay lighting systems, including lamp and fixture options, maintenance, lumen depreciation and many other factors. It also includes useful performance comparison charts on lamp options and case studies on different high bay lighting applications.

**Rebuild America State & Local Government Program Brief** – a two-page document highlighting Rebuild America work with state and local governments. Written to serve as a marketing tool.

**Window Treatments for Energy Savings** – a teaching tool for middle school students. Heat will enter through a window on warm days and escape through a window on cold nights. Students will identify warm and cold indoor areas and learn about window treatments that save energy.

**Yesterday and Today** – a teaching tool for very young students. The students will interview someone who grew up before the modern era of great electricity usage. Students will compare their own usage of energy-consuming devices with that of their parents and grandparents.

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## New Partnerships

- |  |   |
|--|---|
| City of Olympia, WA                      | Maine Public Utilities Commission Energy Division, ME |
| City of Tolleson, AZ                     | Minnesota Alternative Energy Partnership, MN          |
| Community Greenhouse Foundation Inc., FL | New York Energy Smart Communities – Pratt, NY         |
| Concord Housing Authority, NH            | New York Energy Smart Communities – SoBRO, NY         |
| Colorado River Indian Tribe (CRIT), AZ   | North Panola Schools, MS                              |
| Division of Capital Asset Management, MA | Ohio Board of Regents, OH                             |
| Duke University Medical Center, NC       | Putting Green Inc., MN                                |
| Florida A&M University, FL               | Rebuild Belmont, MA                                   |
| Franklin County Public Schools, VA       | Rebuild Highland Park Borough, NJ                     |
| Grand Traverse Heritage Center, MI       | Rebuild Princeton, IL                                 |
| Harvard Green Campus Initiative, MA      | Renewable Energy Vermont, VT                          |
| Holmes County School District, MS        | Santa Cruz County, AZ                                 |
| Industrial Foundation of Washington, MS  | Schuyler County Community Energy Program, IL          |
| Los Angeles Unified School District, CA  | Town of Patagonia, AZ                                 |



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