Rebuild America

EnergySmart Update

Weatherization and Intergovernmental Program

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Older Buildings Save Energy by Recommissioning

Commissioning involves testing, monitoring and adjusting a building's controls and systems to ensure efficient operation. This process is often associated with new construction, but it can also be applied to existing buildings through what the Center for Energy and Environment (CEE) refers to as "recommissioning."

"It's a tremendous opportunity to save energy," says Martha Hewett, with CEE. "It is highly cost-effective and largely untapped."

Recommissioning is particularly important for the efficient operation of heating, ventilation and air conditioning systems. Each HVAC system is a unique design for a particular building, purchased from different vendors, installed by different contractors and operated by different facilities staff. Each fix is one of a kind.

Along with HVAC, many important systems are finished at the end of construction, and it

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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

Representatives from state colleges listen at June workshop in Columbus, Ohio.

Regents Unite State Colleges for Efficiency Projects in Ohio

There are various ways of creating partner networks to spread energy efficiency. In Ohio, a unique approach pulls together state colleges and universities through the efforts of the Ohio Board of Regents, which has become a Rebuild America partnership.

Regents staff are trying something that positions them halfway between the local champions of many communities and the statewide approaches of New York and Wisconsin. They are encouraging all 38 state institutions of higher learning – the member institutions of the Board of Regents – to join as individual partners in the board's partnership.

For the regents, the primary driver is the need to help state colleges and universities save money that can be used for deferred maintenance on buildings and utility infrastructure. The regents have estimated that deferred maintenance at about $2 billion.

Some campuses already explore the technologies and operational practices of energy efficiency on their own. "But we'd like to extend that and grow that so that all the campuses at some point are talking to each other and establishing best practices, that kind of thing, so that everyone in the network benefits," says James Nargang, assistant director for capital development for the Board of Regents.

Working with the state energy office within the Ohio Department of Development, the regents have been using a $50,000 grant from Rebuild America to organize the energy efficiency drive. The regents' staff is a somewhat decentralized organization that has taken on a coordination and consultative role for energy efficiency.

A parallel $50,000 grant went to the private sector, to the Ohio Foundation of Independent Colleges and Universities.

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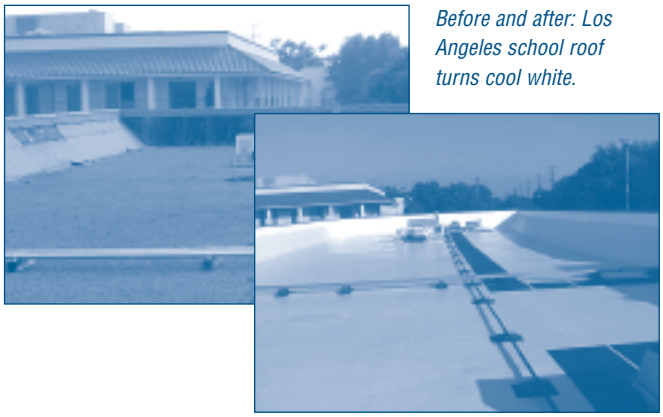
Los Angeles Schools: Big in Efficiency, Too



Before and after: Los Angeles school roof turns cool white.

The Los Angeles Unified School District (LAUSD), where everything sounds big, has become one of the larger Rebuild America partnerships in the K-12 school sector. The district plans hundreds of retrofit projects worth tens of millions of dollars, and it is building 100 new schools, which will boost its total to more than 1,000.

But in one respect, at least, LAUSD is not oversized. It is keeping its energy consumption below national averages by several different scales of measurement – cost per square foot, cost per student, cost per commodity. Another indicator is the fact that energy expenditures for the district in 2003-04 were less than what it spent in 1997-98.

The district plans an extensive array of improvements that will boost energy efficiency farther over the next several years.

Hundreds of Projects

"We've identified about 500 lighting projects that are on a fast track for completion in the next 18 months," says Kenneth Davis, LAUSD's energy manager. Performance contracting will be used for the lighting retrofits, with the work load subdivided into geographic batches to localize the activity for contractors and to avoid overwhelming any one energy service company.

The district intends to install equipment with greater efficiency in its heating, ventilation and air conditioning (HVAC) systems as existing equipment reaches the end of its lifespan.

The lighting and HVAC projects might require about $50 million, Davis says. As a rough estimate, that is approximately how much LAUSD already has spent on energy retrofits since about 1997-98.

The professional staff takes a business-like approach to projects. The retrofit must be capable of producing a simple payback within five years in order to be considered. Projects also must fit within the district's strategic plan, which has been modified as successive bond issues have opened doors to the financing of more work.

Those financial and strategic restrictions leave plenty of options. For example, a reflective roof is a good idea to minimize the buildup of excess solar energy in sunny Southern California. LAUSD participated in the recently ended Cool Roof Program administered by the California Energy Commission.

Another option is to shop around in the wholesale market for suppliers of electricity. LAUSD no longer is captive to a local utility. Davis says the district saves about $7.6 million a year through its long-term wholesale purchasing agreements for electricity.

Networking with Experts

To get the best ideas and advice on strategies, it helps to network with other professionals. The benefits of expertise and networking are the reasons the school district chose to become a Rebuild America partnership. Not only does the Los Angeles Unified School District have the experts of Lawrence Berkeley National Laboratory nearby, it has access to such visiting specialists as Larry Schoff, the EnergySmart Schools sector technical analyst.

"I met Larry Schoff out here, and he was just a wealth of knowledge," remarks Davis.

Personal contacts also help. Davis likes to keep in touch with people at Stanford University and New York Tech, his alma mater, where graduate school students and instructors share with him their knowledge of current and emerging technologies and implementation methods while he fills them in on real-world applications of current energy-efficient technology.

For the swarm of new schools being built, LAUSD can turn to the standards of the Collaborative for High Performance Schools (CHPS), another Rebuild America partnership. CHPS works to improve the energy efficiency of designs for California schools, and LAUSD has been a pioneer in developing and implementing the organization's designs.

Davis serves as the representative of the Maintenance and Operations Branch Director on a LAUSD committee whose task is to apply CHPS design standards.

For more information, contact Kenneth Davis, 213-633-7267, email kdavis@lausd.k12.ca.us.

Saint Louis Zoo Audit

The Saint Louis Zoo, home to such rarities as Amur tigers and snow leopards, also wants to be distinguished by energy efficiency. The zoo spends nearly $1 million a year on energy. Now, a $32,000 Rebuild America grant, channeled through the Missouri Department of Natural Resources, has been awarded to help fund an extensive energy audit.

"The zoo has shown a rare level of commitment to this process of self-evaluation, and I have no doubts that not only will their effort pay off for the environment, but it will improve the bottom line," says Pat Justis, state representative for Rebuild America.

The zoo is providing about $37,000 in cash and in-kind services of its own, a reflection of that commitment. The zoo must implement at least some of the audit recommendations to receive the federal grant. That requirement helps the Department of Natural Resources ensure that the audit has an impact.

The zoo also asked for advice on saving water, which can save energy by reducing the amount of heating or chilling for water. Working with the Department of Natural Resources Energy Center, the zoo implemented such strategies as identifying and fixing leaks in underground pipes, and moving alligators to inside displays in winter instead of heating water for an outdoor display. A huge leak already has been identified in a pipe carrying seasonally heated or cooled water.

For more information, contact Pat Justis, 314-340-5930, email pat.justis@dnr.mo.us.

David Garman, assistant secretary for energy efficiency and renewable energy, listens as Charlotte Streibel accepts a Region of the Year award on behalf of Barnstable County, MA, and the intergovernmental group Cape Light Compact. The award, from the National Energy Education Development project, was part of NEED's National Youth Awards Program for Energy Achievement. The recognition was bestowed June 28 at a ceremony in the Department of Interior headquarters in Washington, DC. Barnstable County is a Rebuild America partnership, and NEED is a Strategic Partner.

View From DC

by Daniel Sze

From Times Square to Honolulu, nighttime urban landscapes have their display lighting. Some of it is dense with information, some is pure form and color, as companies compete for consumers. A similar role is played by lights in showcase windows and on walls that you walk past inside shopping malls. In all of that display lighting – outdoor or indoor, incandescent or fluorescent or neon – opportunities await for greater energy efficiency.

Commercial buildings vastly outnumber government buildings, and it is the commercial sector that needs attention-getting lights to attract the public. Innovation can alter the technology of that lighting radically. Light-emitting diodes (LEDs) should make deep inroads into display lighting – or they will if we give them a strong enough push.

An LED light is not necessarily more efficient than a fluorescent light, measured simply in terms of lumens per wattage. But overall system efficiency with LEDs can indeed be superior, partly because LEDs direct light in a more controlled fashion, wasting less of it. LEDs also are more durable, with lower maintenance costs. And where LEDs replace incandescent bulbs, the savings can be huge. At one casino-hotel in Reno, NV, the owner's decision to shift his multistory outdoor display sign to LEDs was expected to save him $16,500 a month. Hundreds of 40-watt bulbs were to be replaced on that one sign.

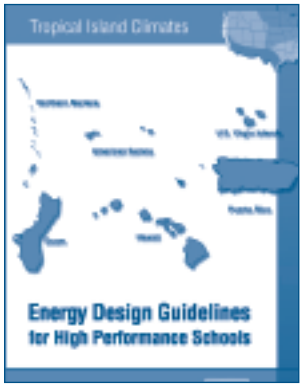
A primary barrier holding LEDs back from display lighting is the lack of standardization. LEDs can't simply be plugged in as replacements for other lights in the way that a compact fluorescent bulb can be screwed into the socket of an existing lamp. But innovators are developing preconfigured LED modules, which amounts to including a socket and light array as a kit. That approach already is used to upgrade exit signs in many buildings and traffic lights in many communities.

Lighting technologists also are working on LED technology standardization, especially through the National Electrical Manufacturers Association. It is a consensus-building process that takes a bit of time. Some Rebuild America Business Partners are among the leaders inventing LED systems and advocating standards.

If you are involved in any appropriate commercial sector project, think about it. Consider the potential savings. At some point, we can topple another commercial barrier, and the night skyline will be illuminated with beacons of energy efficiency.

Dan Sze is National Program Manager of Rebuild America. Your comments are always welcome at danielsze@rebuild.org.

Design Guidelines Go to Climatic Extremes of Arctic and Tropics



The latest additions to the Energy Design Guidelines.

Some buildings are beneath palm trees while others are beneath snow drifts. Because the United States has school buildings from American Samoa to the North Slope of Alaska, the U.S. Department of Energy (DOE) has drafted two more sets of design guidelines to take account of the needs of the farthest reaches of U.S. territory.

Skylights are more valuable in Alaska, the low elevation angle of the sun posing less of a risk of overheating or glare through skylights so far north.

DOE already had published seven books in the series, *Energy Design Guidelines for High Performance Schools*. The two new publications, released July 1, 2004, are for tropical island climates and arctic and subarctic climates.

The new documents were developed by the National Renewable Energy Laboratory (NREL) with subcontractors Architectural Energy Corporation and Innovative Design.

The designs for tropical islands take into account the conditions in Hawaii, Guam, American Samoa, the Northern Mariana Islands, Puerto Rico and the U.S. Virgin Islands. The designs for arctic and subarctic zones are for Alaska.

Some of the climatic variables of the guidelines are exactly what a reader would expect for warm and sunny areas versus frigid areas.

To minimize overheating in tropical climates, the recommendations include shading to minimize direct sunlight, through such devices as overhangs and lightshelves. A good idea also is to orient windows away from the sun – facing the windows northward if the islands are in the northern hemisphere.

For arctic and subarctic climates, the recommendation is to orient windows southward to catch as much sunlight as possible. Lightshelves also can be useful in cold climates – but only indoor lightshelves, because such horizontal reflective surfaces will catch too much snow on the outside. Skylights are more valuable in Alaska, the low elevation angle of the sun posing less of a risk of overheating or glare through skylights so far north.

Insulation is a central concern for building shells in Alaska. The draft guidelines cite structural insulated panel systems (SIPs) as a good option. They consist of rigid foam insulation sandwiched between two panels of strand board or plywood, with no thermal bridges between interior and exterior surfaces. They are available in thicknesses of six to 12 inches.

Durability is a greater concern in the tough climates of Alaska, and that includes the ability to cope with snow and ice accumulation. Sloped roofs, for example, should be fully and consistently insulated to create a uniform exterior temperature to prevent ice dams and related problems.

In tropical climates, radiant barriers (inside the buildings) and cool roofs (highly reflective exterior surfaces) are needed to prevent excessive solar heat gain.

For the islands, case studies are drawn from Chiefess Kamakahelei Middle School in Lihue on Kauai in Hawaii; Anderson Air Force Base Elementary and Middle School in Guam; St. Croix Educational Complex in the U.S. Virgin Islands; and Iolani School in Honolulu, Hawaii. For the Alaska climates, case studies include New Craig High School in Craig, Fairview Elementary School in Anchorage and Buckland K-12 School in Buckland.

For more information, see the documents posted in the Rebuild America Web site (www.rebuild.gov), in the New Construction section of the Solution Center.

Rebuild America Progress Calculator

Number of Partnerships:

684

Total Number of Committed or Completed Square Feet:

1,514,448,531

as of July 14, 2004

Washington State Helps Schools Save Through Performance Contracting

The state of Washington is providing an array of assistance to K-12 schools implementing energy saving performance contracts (ESPCs). From providing contract assistance to project management services, this program is helping schools save energy without tapping into taxpayer dollars.

Many K-12 schools in Washington are unaware of the performance contracting resources available from the state's Department of General Administration, says Karen Messmer, the Rebuild America state representative.

The core mission of these school districts is to educate. With tight budgets, they have to balance priorities – which means energy retrofits often compete for scarce dollars. "It's hard for schools to look at long-term energy efficiency investments," says Messmer.

Last year, the state was awarded a Rebuild America/State Energy Program Special Project grant, part of which is dedicated to connecting K-12 schools with ESPC resources available from the state.

Years of Experience

The state of Washington has extensive experience with performance contracts, says Clint Lougheed, energy program manager for the Department of General Administration's Energy Program. In such contracts, future savings on utility bills finance capital improvements. His department completed the first ESPC for a state building in this country in 1984.

The state then implemented an energy performance contracting system for public agencies. The program, administered by the state's design and construction agency, has completed over $100 million in performance contracts, saving the state $8.3 million annually.

The program was so successful that the market for ESPCs began to diminish – every state agency, four-year public university, and nearly all the community colleges participated.

To continue the improvements, the Department of General Administration turned to local governments and K-12 schools.

ESPCs can be a tough sell because schools have limited operating hours and energy rates are relatively low in Washington, which lengthens payback periods, says Lougheed, who wrote the state rules on performance contracts.

Lougheed's department, though, has licensed mechanical and electrical engineers on staff who can help identify cost-effective energy efficiency improvements.

"We will help them every step of the way," he says. The program offers pre-qualified energy service companies, so that school districts can avoid a request-for-proposal process. Lougheed's staff can also write contracts, review design, manage a project and provide measurement and verification services.

The Department of General Administration will also loan instruments to school districts interested in monitoring energy use or performing self-audits.

The program, administered by the state's design and construction agency, has completed over $100 million in performance contracts, saving the state $8.3 million annually.

Methods of Funding

There are no local, state or federal appropriations for this program, which is supported by project management fees. If an energy audit does not identify cost-effective energy-saving projects, no fee is charged, eliminating the financial risk for clients. The Department of General Administration will only receive a fee – factored into the cost of the project – after an ESPC is successfully completed.

Many of the participating schools use the state's Local Option Capital Asset Lending (LOCAL) program to finance the projects. The low-interest loans help schools that otherwise would not be able to pay for capital improvements.

South Kitsap School District in Port Orchard used a combination of LOCAL funds and a grant from utility Puget Sound Energy to finance $1.6 million in improvements with assistance from the Department of General Administration. Siemens Building Technologies, a Rebuild America Premier Business Partner, installed a heat recovery chiller and cooling tower that heats a swimming pool and the building it occupies, as well as dehumidifying the air. The funds also paid for a district-wide lighting retrofit. The school district is saving over $200,000 annually on its utility bills as a result of the improvements.

For more information, contact Clint Lougheed, 360-902-7262, email cloughe@ga.wa.gov, or Karen Messmer, 360-956-2090, email messmerk@energy.wsu.edu.

Cogeneration Strikes Balance, Saves Money as It Meets Multiple Energy Needs On-Site

Cogeneration can work well for commercial and government buildings, and in fact it has been used for many decades on college campuses and at hospitals. But the market potential is much greater, spread across a range of commercial and institutional sectors.

Cogeneration – or combined heat and power (CHP) – addresses at least two needs at once, but the needs must coincide to make the economics work.

On a small scale, cogeneration can supply a health club with the electricity it needs to keep the lights and equipment running and the heat it needs to keep its air or swimming pools comfortable at the same time. A step up from that might be a hospital or a large hotel with CHP. On a large scale, cogeneration can light up and either warm or cool an entire college campus. In addition to electricity, heat and cooling, a CHP system can support dehumidification or thermal storage.

There is too much risk in planning to sell surplus power into the regional electrical grid, said specialists at the Energy Smart America 2004 conference. Because of this, systems are usually sized only to satisfy on-site building loads.

A Menu of Technologies

Within the U.S. Department of Energy (DOE), the Office of Energy Efficiency and Renewable Energy (EERE) is trying to advance CHP through the Distributed Energy Program. Gas turbines of various sizes, gas-fired reciprocating engines and thermal systems provide options for technological development.

Packaging systems together or analyzing the markets and developing strategies for opening the markets will also advance CHP.

Pre-packaged systems may greatly reduce engineering costs, says Merrill Smith, who leads several of the CHP efforts for EERE. System components designed in advance to work together also are likely to achieve greater efficiencies than systems built for separate operations and then integrated together.

When energy service company Chevron Energy Solutions "runs the numbers" on gas-fired technologies for customers, it typically finds that internal combustion engines (reciprocating engines) have the best economics. Large gas turbines are a tried-and-true technology, but they cost much more than do internal combustion engines, and they cannot be "turned down" to moderate their output, notes Tim

Strobel of Chevron Energy Solutions, a Rebuild America Business Partner. Microturbines fascinate many people, but they are still a developing technology.

District heating plants can be among the most convenient places for CHP. A large plant may operate at high pressure to push steam through pipes that radiate out across a campus or part of a city. Pressure release valves may be connected to the central plant to regulate the pressure. If system owners substitute back-pressure steam-driven generators for the valves, the result is power and heat together, without need of additional fuel.

Money and Utilities

Financial risk for CHP can come from fluctuations in the prices of natural gas and electricity, noted participants in a panel discussion at EERE's Energy Smart America 2004 conference in mid-May.

When gas prices are above $5 per million Btu, an end-user power cost below 6 cents per kilowatt hour is low enough to discourage a shift of consumption from the grid to an on-site gas turbine unless there are factors such as reliability, power quality, security or required on-site backup power. High end-user prices for power, as in California and many parts of the Northeast, encourage a shift to gas, but many regions are enjoying moderate electricity prices, at least for now.

There also is too much risk in planning to sell surplus power into the regional electrical grid, said specialists at the Energy Smart America 2004 conference. Because of this, systems are usually sized only to satisfy on-site building loads. Utility interconnection charges, standby rates and other factors can undermine the value of a larger CHP system selling power into the grid.

Market Studies

For more information on the potential applications of cogeneration, several reports are available:

Combined Heat and Power: A Federal Manager's Resource Guide is in the Solution Center of the Rebuild America Web site (www.rebuild.gov). It explains technologies, outlines application procedures and has case studies.

National Account Sector Energy Profiles was written for DOE's Oak Ridge National Laboratory (ORNL). It is a 2003 study of five promising cogeneration market sectors, including health care (hospitals and nursing homes), supermarkets, lodging (hotels and motels), restaurants and "big box" retail. It can be accessed directly at www.eere.energy.gov/de/pdfs/national_accounts.pdf.

Integrated Energy Systems (IES) for Buildings: A Market Assessment is a study written for ORNL in 2002. It takes a wide and deep look at CHP potential in the U.S. building sector and sees great growth prospects. It can be accessed at www.bchp.org/pdfs/IES_Resource_Dynamics-FinalReport-0209.pdf. It is posted in a Web site (www.bchp.org) set up by DOE to provide CHP information.

For more information, visit the Distributed Energy Program at www.eere.energy.gov/de. The Web site's "About the Program" connection takes visitors to the CHP program (with Merrill Smith's email contact information) and related programs.

College's New System

At Mt. San Antonio Community College in the Los Angeles metropolitan area, Chevron Energy Solutions has installed two 750 kW gas-fired internal combustion engines in a central energy plant in a CHP configuration. The engines were being tested and synchronized in June before going into regular service. The campus, serving close to 40,000 students, needs a little more than 2 MW of power, and it is growing, with its demand projected to climb to 3.5 MW within five years.

At the same time, the campus needs cooling all year round, and it now has an absorption chiller system linked to the central plant. Absorption chillers can be driven by exhaust heat. The new CHP system also will be able to send heat into a heating system for space heating, and it can feed a thermal storage (ice) system.

Savings for Mt. SAC, as the college is nicknamed, are projected at $1 million a year from the CHP system, Strobel said. The system was installed as part of a very extensive campus upgrade under a 15-year performance contract with an overall project cost of $12.6 million.

Colleges and universities around the country are facing the need for upgrades to infrastructure that in many cases dates back to the 1950s and 1960s. That creates CHP opportunities, as does the fact that many colleges anticipate expanded power demands.

At the central plant, from left: John Mahoney of Chevron, Greg Coxsum of Chevron, Barbara Price of the Mt. SAC Oversight Committee, Mt. SAC President Christopher O'Hearn and Mt. SAC Board of Trustees President Fred Chyr.

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Ohio Regents

University of Akron campus may be nearing capacity limits on some infrastructure.

Manny Anunike of the state energy office has helped spearhead the Board of Regents partnership and bring energy experts to the table to advise institutions. He is the Rebuild America state representative in Ohio. The effort has the support of Sara Ward, chief of the state energy office and current chair of the National Association of State Energy Officials, a Rebuild America Strategic Partner.

Nargang has been the Board of Regents' point man for the Rebuild America partnership. Kirk Bond, Rebuild America's colleges and universities sector coordinator, also has been helping to move plans along.

Signing Up Partners

There also is home-grown pressure on institutions to impel them to join up.

"We suspect that we are nearing capacity on some of our central systems," says Frank Horn, director of architectural design and construction for the University of Akron. "We talked with Jim Nargang and Manny about the opportunities that might be out there, and what measures might be available that would allow us to do other things than just add more central plant right out of the gate."

Horn also suggests there is more to be gained through pooled information among colleges than by acting independently. The multi-university partnership, in other words, offers its own form of efficiency.

The partnership held a consultation workshop April 29 where state energy specialists were able to hear the interests and concerns of about 25 or 30 people from the colleges and universities.

"They told us what they wanted in energy efficiency, so we set to work studying what was important to them," Anunike explains.

Twelve institutions agreed at that meeting to sign up as partners.

Two more workshops were held over the next few months after that, and a presentation was made to college and university fiscal representatives. In early July, more workshops were in the planning stages.

Separate visits to campuses also have been arranged so that Ohio energy office personnel can learn more about individual and unique needs. Facilities managers and planners, architects, engineers and financial people all have light to shed on the subject as well as things to learn about energy efficiency.

Strategies to Share

The Board of Regents is encouraging such ideas as campus master plans, adoption of best practices, benchmarking and various financial strategies. The partnership also is talking about forming standing committees for some of those subject areas.

Financial strategies might include such things as performance contracting and joint purchasing of energy. Anunike can provide a working example of joint purchasing from another Ohio sector. One of the more distinctive money-saving projects in his state is the purchasing of natural gas by a group of public housing authorities, including Stark Metropolitan Housing Authority, a Rebuild America partnership. The housing authorities find they can obtain better rates by joining together and purchasing through a broker, which does the negotiating for the group.

Joint energy purchasing was a subject raised frequently in the 1990s during discussions of energy industry restructuring, for both natural gas and electricity. But then the idea faded into the background. Now, with natural gas prices persistently high, it is drawing interest again.

The Midwestern Higher Education Compact (MHEC), an organization with 10 state government members, has been following the development of the Board of Regents partnership. It decided to send a representative to an Ohio Board of Regents consultative workshop where joint purchasing and other financial strategies were on the agenda. MHEC already supports group purchasing of computer hardware and software and telecommunications products and services.

For more information, contact Kirk Bond, colleges and universities sector coordinator, 816-587-0311, email kbond@rebuild.org.

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Recommissioning

is essential that they operate properly to maximize energy savings, says Hewett. Problems during construction can be compounded over the operational lifetime of the building as repairs and modifications occur. Facilities managers are under pressure to resolve occupant complaints about comfort. Quick fixes may quiet the grumbling but waste energy.

Recommissioning examines how to improve a building's operations and systems to ensure they are operating as they were designed to function, which saves energy and increases occupant comfort.

Helping Hospitals

Fairview Health Services teamed up with CEE and Texas A&M University Energy Systems Laboratory to recommission a large hospital in Minneapolis that was built in the early 1980s.

The understanding of building science has changed since many hospitals were constructed, says Bruce Nelson, Minnesota state representative for Rebuild America. Recommissioning aligns the buildings with current operational guidelines, codes and standards. "There is tremendous potential for energy savings in hospitals," he says.

For example, hospital HVAC systems – designed to minimize the spread of disease – are complicated, so it is important that they work properly to ensure optimum energy performance.

At Fairview, strategies to save energy included making the existing control systems work as originally designed, says John Marshall, director of facilities services for Fairview Health Services. However, the most important part of the recommissioning process was training the front-line staff who know the systems inside-out, he says.

Hospitals have tremendous potential for energy savings.

The hospital is saving more than $180,000 in energy costs annually. With a rebate from Xcel Energy, the local utility, the payback period was less than one year. In general, payback on recommissioning is between 1.5 and 3 years.

Working with Utilities

Much of the energy consumed in larger buildings is tied to controls and systems more than individual pieces of equipment, says Hewett. Utility rebate programs, though, tend to cover equipment retrofits rather than system efficiency.

Recommissioning can be a tough sell because it is a process; there are no glossy catalogs filled with energy-saving products to show owners. It is also a technical challenge, because recommissioning cannot disturb a building's operations.

Utilities are struggling to design rebates for services, says Rich Szydlowski, with CEE. Utilities rebates are oriented toward equipment retrofits, which are easy to verify, but recommissioning involves operational changes, where typically there is no new equipment to count.

Using a Rebuild America grant, CEE produced case studies on recommissioning. The case studies were instrumental in convincing Xcel Energy to create a recommissioning rebate program. CEE performs the initial walk-through at no cost, and if the owner elects to use recommissioning, Xcel Energy will provide financial support.

CEE is now working with the local gas utility to develop a recommissioning rebate program for next year.

Szydlowski predicts that recommissioning will continue to grow. It is a continual effort to train and educate facilities staff, though, he says. He advocates Texas A&M's concept of Continuous Commissioning, along with good training and documentation, to fully realize the benefits of recommissioning.

Recommissioning has no exact definition, says Hewett. Some use the term to describe commissioning a building that has previously been commissioned. Others, like CEE, use it as a substitute for "retro-commissioning" – which refers to a building that was never commissioned, but is now undergoing that process. CEE prefers the phrase recommissioning because it gets a better response than the term retro-commissioning.

For more information, contact Rich Szydlowski, 612-335-5862, email rszydlowski@mncee.org.

State Building Codes Refined and Simplified

State and local regulators who write building codes are moving toward simplification of many standards while adding new standards for moisture control and mechanical ventilation. Although it is not easy, the regulators also are convincing builders to line up in support, according to Bruce Nelson of the Minnesota Department of Commerce and David Weitz of the nonprofit Building Codes Assistance Project.

The speakers, at the Energy Smart America 2004 conference, explained the shifting landscape of codes and the ways to convince wary builders that the codes are good ideas.

Mechanical ventilation and makeup air are big issues for code improvements around the nation. Ventilation is important to preventing stale air and the trapping of moisture. Makeup air compensates for the exhaust from appliances. The more tightly built structures these days may allow fewer air leaks, but they also can trap moist air in various nooks and crannies rather than allowing all parts of the building to dry out. Trapped moisture can be unhealthy for occupants and the buildings themselves.

Minnesota has strengthened its code in recent years with standards on moisture control and mechanical ventilation, the idea being to balance the three goals of energy efficiency, moisture control and indoor air quality, Nelson said.

"It was a struggle," Nelson said of the effort to draw industry support for the new standards. "It's explaining it to builders, explaining it to builders, explaining it to builders. … But they're very much on board with us now."

It also is a matter of giving builders a lot of time to adjust, giving them financial assistance for training, and making sure they understand the scientific details, Nelson said.

Weitz noted that there can be considerable pressure to get mold under control. Partly because of lawsuits over mold, insurance companies have been a primary source of such pressure.

Both speakers stressed the trend toward simplification, making codes less daunting and burdensome to builders – and increasing compliance as a result.

Citing a recent study by Oak Ridge National Laboratory, Weitz also emphasized that codes are among the most cost-effective programs among those supported by the U.S. Department of Energy's State Energy Program.

For more information, contact Bruce Nelson, Rebuild America Minnesota state representative, 651-297-2313, email bruce.nelson@state.mn.us.

Upcoming Events

September

20-21 **5th Annual Combined Heat and Power Roadmap Workshop**, sponsored by the U.S. Department of Energy, the U.S. Environmental Protection Agency, and the U.S. Combined Heat and Power Association. Austin Airport Marriott South, Austin, Texas. Contact Lauren Giles at 410-953-6250 or email lgiles@energetics.com.

22-24 **World Energy Engineering Congress**, presented by the Association of Energy Engineers. Austin Convention Center, Austin, Texas. Visit www.energycongress.com.

October

12-13 **4th Annual Empire Energy & Environmental Exposition**, presented by the Environmental Business Association of New York State Inc. Gideon Putnam Hotel and Conference Center, Saratoga Springs, NY. Call 518-432-6400.

15-19 **Association of School Business Officials International Annual Meeting & Exhibits**, Cincinnati Convention Center, Cincinnati, Ohio. Call 703-708-7080.

21-23 **Sustainability and Higher Education Conference**, presented by the Education for Sustainability Western Network. University of Portland, Portland, OR. Call 503-943-7760 or email info@efswest.org.

22-24 **Council of Educational Facility Planners International Annual Conference**, Hyatt Regency Atlanta, Atlanta, GA. Visit www.cefpi.org/atlanta2004/.

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.

BUSINESS PARTNER

NORESCO Helps Customers Save Energy Dollars

NORESCO, a subsidiary of Equitable Resources, is an energy service company that brings nearly 20 years of experience to Rebuild America, helping the program advance energy-efficient technologies and practices.

"Rebuild America and NORESCO have shared goals," says Andrew Beggs, director of project development in the company's Ontario, CA, office. Both organizations are working to save resources and reduce energy costs, he says.

The Massachusetts-based company, with offices around the nation, has earned Premier Business Partner status due in part to its participation in Rebuild America's energy technology seminars.

NORESCO
An EQUITABLE RESOURCES Company

Performance Contracts

NORESCO provides turn-key design-build services for energy infrastructure projects. The full-service company does it all – from energy audits and engineering design to project management and operations and maintenance. It is among a select group of companies that has earned Energy Service Provider accreditation from the National Association of Energy Service Companies.

The company primarily focuses on energy saving performance contracts, in which future utility savings finance energy-efficient infrastructure improvements. Often, NORESCO will replace aging, inefficient equipment with modern, high-efficiency systems.

"NORESCO is first and foremost an engineering and construction-focused company," says Beggs. Unlike some energy service companies, the company does not produce its own line of equipment for projects.

The company works with the private and public sectors, with the latter representing a majority of its projects. "With public entities struggling with budget problems, infrastructure improvements often take a back seat," says Beggs. Performance contracts help these customers finance improvements without draining their capital budgets.

East Coast, West Coast

NORESCO's projects vary by climate, cost of electricity, availability of utility rebates, and customer needs. In general, lighting is the most popular retrofit, followed by heating, ventilation and air conditioning system improvements.

In California, the high cost of electricity makes cogeneration – most often capturing waste heat from a generator to power other equipment – popular for community colleges and universities. At Humboldt State University, in Arcata, CA, NORESCO installed a system in which a natural gas reciprocating engine produces electricity while its waste heat is used to heat a building, says Wes Herman, manager of energy engineering in the company's Sacramento office.

Water conservation improvements are also popular in the West, due to a lingering drought.

On the East Coast, NORESCO is working with Fairfax County (VA) Public Schools – one of the nation's largest school districts and a Rebuild America partner. The company and the school district are engaged in a multi-phase, $13 million performance contract projected to produce $1.5 million in annual energy cost savings.

The projects involve 40 schools and one administrative center, ranging from lighting retrofits and window replacements to upgraded boiler systems and building controls. The improvements are being installed during evenings, weekends and holidays to avoid disrupting classes.

"We get a lot interest in renewables, especially photovoltaics," says Beggs. Some of the renewable energy projects are expensive, creating long payback periods. To address the challenge, NORESCO works with its clients to find dual purposes for the installations. At the North Island Naval Installation in San Diego, NORESCO installed solar panels that also serve as shading for parking spaces. Some customers, such as colleges and universities, could charge a premium for shaded parking spaces.

For more information about NORESCO, visit its Business Partner entry at www.rebuild.gov, or visit the company's Web site at www.noresco.com.

Premier Business Partners

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

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.

To learn more, visit www.eere.energy.gov

New Partnerships

City of Bowie Rebuild Partnership, MD

City of Euclid, OH

Condon School District 25J, OR

Duke University Medical Center, NC

Ecology Action Center, IL

Franklin County Public Schools, VA

Howard University College of Engineering, Architecture and Computer Sciences, DC

Norfolk Environmental Commission, VA

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Rebuild America
U.S. Dept. of Energy

Rebuild America is a network of partnerships – focused on communities – that save money by saving energy. These voluntary partnerships choose to improve the quality of life in their communities through energy efficiency. Rebuild America supports them with customized assistance backed by technical and business experts and resources.

Published bimonthly by the U.S. Department of Energy, EnergySmart Update also incorporates news of other programs within the Office of Energy Efficiency and Renewable Energy.

Newsletter contact:
Alan Kovski, 202-466-7391 or akovski@pcgpr.com.
To subscribe:
rebuildorders@rebuild.org or 252-459-4664.

Marketing and Communications Rebuild America Help Line 202-466-7868

REBUILD AMERICA
Office of Energy Efficiency
and Renewable Energy
U.S. Department of Energy
1000 Independence Avenue, SW
Washington, DC 20585-0121

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