

EnergySmart Update

Weatherization and Intergovernmental Program

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Virginia County's Incentives Foster Green Buildings

Arlington County, VA, is an urban community next door to the nation's capital. As it attracts more residents and workers, the county is acting to reduce the energy consumption and environmental impact of new buildings while expanding services for additional residents and businesses.

To encourage development of resource-efficient and healthy buildings, the county created a green building incentive program about five years ago. Under the program, developers of commercial sites can request additional density (i.e. floor space) on a site if their project meets the standards of the LEED Green Building Rating System.

LEED, or Leadership in Energy and Environmental Design, is a voluntary rating system administered by the U.S. Green Building Council.

Developers in Arlington may be awarded

Continued on page 4



The headquarters of the Albuquerque public housing authority.

Teamwork Wins Upgrades for Housing in Albuquerque

Public housing in Albuquerque, NM, shows the signs of age. The 28 complexes, holding 953 units, need modernized lighting, refrigerators, air conditioning, plumbing and elevators. But when Rebuild New Mexico recommended Albuquerque use performance contracting, city officials mistrusted the idea.

A performance contract pays for improvements through the savings generated by the improvements. To many officials, including members of the city council, that seemed to be "something for nothing."

The skepticism proved to be the largest obstacle to an extensive new retrofit program. Rebuild New Mexico recommended performance contracting and explained it to the public housing officials. The housing officials then formed a dedicated task force that plugged away for a few years to overcome the doubts. The task force included the housing director, the building maintenance manager, the finance manager and a city attorney.

"It's been an uphill battle simply because people don't think this can happen," says Fernie Martinez, public housing manager for Albuquerque. He was the building maintenance manager while the task force still was active. He admits that he, too, was one of the skeptics when he first heard the idea of performance contracting.

Continued on page 9

In This Issue

- 2 Montana Housing
- 5 Michigan State Faculty Ideas
- 6 Tech: Landfill Microturbines
- 7 Tech: Efficient Boilers
- 11 Profile: Watt Stopper



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

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

Hotel Converted to Efficient Housing in Montana



Rebuild America technical service provider Alan Nagle amid the solar panels atop the Acme building in Billings, MT.

The historic Acme hotel in downtown Billings, MT, is starting a new life as a multifamily housing complex for low-income families. Recently added to the National Register of Historic Places, the building was constructed in 1911 and now has been extensively renovated by the nonprofit group homeWORD. The group approached its task with a respect for history – for example, salvaging original wood and turning it into trim and flooring.

The Acme building not only has been a hotel but a theater, a bar, a retail site and an abandoned structure. Its latest transformation will allow it to hold 19 households. The building's new life also is intended to help revitalize the downtown by bringing people back to live there.

Commissioning Will Help

Montana Rebuild partnered with homeWORD to fund 50 percent of the cost to commission the Acme building's new HVAC (heating, ventilation and air conditioning) system and controls. Commissioning helps assure that systems operate as designed and meet the needs of a building.

It is not uncommon to have operational problems – troubles with comfort, ventilation, maintenance, high energy use, etc. – after major retrofits. Unexpected operational demands and added energy costs are challenging to all building owners, especially in Montana's rough winters.

The grand opening for the building was held Aug. 31, with a ribbon-cutting ceremony by Billings Mayor Chuck Tooley. Among other people present, in addition to homeWORD officials, was Toby Benson, Rebuild America's state representative and an official in the Montana Department of Environmental Quality, the lead partner in the Montana Rebuild Partnership. Alan Nagle, a Rebuild America technical service provider based in Denver, also was there.

Tenants were not scheduled to begin moving in until the

start of October, but that did not prevent a group of more than 200 Billings residents from gathering to hear about the building's history, sustainable design features and affordability. People then toured the building.

The renovated building now has on its roof an 18-kilowatt photovoltaic system, the largest in Montana. That not only will reduce the building's reliance on utility electrical power but should reduce carbon dioxide emissions by 531,360 pounds annually, homeWORD estimates. The system uses net metering, allowing it to feed surplus power into the grid and take credit for that in its power purchases from the grid.

The Montana Rebuild Partnership also plans to help fund commissioning of another homeWORD housing complex, the renovated Lenox Flats building in downtown Missoula, MT. The 1905 vintage structure, newly added to the National Register of Historic Places, was revamped in 2001 to contain 10 apartments for low-income people and ground-floor commercial space. Renovation of the Lenox building included low-emissivity windows, an efficient new heating and cooling system, increased insulation and efficient lighting. Commissioning that follows several years after completion of a project still has the same potential value that opening-day commissioning has for correcting problems.

Last year, homeWORD completed construction of the Gold Dust Apartments in downtown Missoula. The building has a 16-kilowatt photovoltaic system able to supply more than a third of the electrical power needed by the building, according to the nonprofit group. The building has high-efficiency fluorescent lighting, ENERGY STAR® clothes washers, water-conserving plumbing fixtures and in-slab radiant concrete floors, among other features.

For more information, contact Toby Benson, 406-841-5231, email tbenson@state.mt.us. Also visit the Web site www.homeWORD.org or email info@homeword.org.

Wisconsin Relights Multifamily Housing

Wisconsin's Focus on Energy program has accelerated the market penetration of compact fluorescent lights (CFLs) in apartment buildings and condominiums through promotion of bulk purchasing and an aggressive program of providing tenants with free in-unit bulb exchanges.

"The evidence is clear that our lighting programs together have changed the wholesale and retail prices of CFL bulbs in Wisconsin in the past two years," says Don Hynek, multifamily program manager in the Wisconsin Division of Energy, which administers the statewide Focus on Energy program. "Wholesale and retail prices have dropped dramatically, and more retailers now have CFLs in prominent stocking locations all year round."

Apartment and condo complexes provide opportunities for substantial energy savings, especially in reducing lighting energy consumption. Property managers are often bulk purchasers of lighting products, but there are a number of obstacles to getting energy-efficient lighting into their buying plans. Price has historically been the most obvious barrier in the case of CFLs. In retail outlets, they commonly cost more than \$6 each – a good 10 times the price of the incandescent bulbs they replace.

And while apartment managers have a strong interest in reducing their cost for common area lighting, they are not the unit occupants who control in-unit lights and pay the in-unit electric bill. An apartment manager asked to provide energy-efficient bulbs to tenants may very well take a box of CFLs and leave them sitting in a storage room indefinitely.

Developing a Market

Focus on Energy has found strategies to get around those problems. Statewide "Change A Light" programs in fall 2002 and fall 2003 signaled retailers that the state was committed to supporting ENERGY STAR® lighting products. Focus on Energy staff started working with retailers almost a year in advance to plan the import and distribution of more than 1 million CFLs. The federal ENERGY STAR label for CFLs also helped, by providing buyers with confidence about the quality of the product.

This statewide and long-term commitment to CFLs provided such a substantial assured market that the prices of CFLs have been driven down. For the year ended June 30, the program provided incentives for 1.3 million bulbs, similar to the preceding year's total.

"When you drive that sort of volume, you are going to

Continued on page 4

View From DC

by Daniel Sze

For public housing, cost factors are critical, making energy efficiency critical. Costs are important to other market sectors, of course, but their impacts are much greater for people living on low incomes, as is the case for so many residents of public housing.

The U.S. Department of Housing and Urban Development estimates that median-income families spend less than 4 percent of income on energy, while low-income families pay an average of 26 percent of income for energy, as measured among households enrolled in Aid to Families with Dependent Children.

Health is another factor. Low-income people are disproportionately affected by harsh weather, because they are less able to afford heating and cooling. In a 1995 heat wave, the death toll in Chicago exceeded 520 and by another estimate reached 739. Studies afterward found that most of those who died were low-income elderly people living in apartments where they lacked air conditioning or could not afford to turn it on.

At the federal level, the Weatherization Assistance program helps the low-income owners of single-family homes improve the energy efficiency of their buildings. Parallel to that, Rebuild America fosters energy efficiency in public and multifamily housing.

Stories in this newsletter illustrate some of the ways Rebuild America is assisting residential improvements. Better heating, cooling, lighting – better methods of financing – all contribute to better lives. Judging from what happened in Chicago, they may even save lives.

In Ohio, as we reported in a previous issue, public housing authorities are saving money through joint purchasing of natural gas. Seven housing authorities formed the program, and this summer an eighth joined. The housing authorities can try other joint efforts, such as electricity purchases, and they can share the knowledge on best practices and technologies that two (Stark and Lucasville) of those eight agencies have acquired through their partnerships with Rebuild America.

Rebuild America is a knowledge and networking resource. We can link up housing authorities and energy experts to the benefit of all. Think about that joint purchasing and information sharing. It would be great to see that strategy continue to expand, spread beyond Ohio and save millions of dollars annually in public housing nationwide.

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

continued from page 1

Arlington

additional, or bonus, density from .15 to .35 FAR (floor-to-area ratio), depending on the LEED level. For example, if zoning regulations allow a 40,000-square-foot building on a site with a FAR of 1.0, a builder could add another 6,000 to

If developers do not pursue LEED certification, they must contribute to a green building fund.

14,000 square feet to the project. The policy also allows for up to three additional stories.

“This kind of additional density

can be a powerful economic incentive as additional areas to be leased,” says John Morrill, the county’s energy manager.

A few years after the program began, the county expanded the policy so that all building projects are eligible.

Development was shifting from commercial to residential, which spurred the change, says Joan Kelsch, with the county’s Department of Environmental Services.

Builders request bonus density when submitting their site plans to the county. The County Board makes the final decision for each project. If additional density is approved, a LEED-accredited professional on the project design team reviews the plans and monitors the construction of the building to ensure it is built with green features. A developer can substitute LEED-acceptable alternatives during construction if a problem with the original design arises.

Two projects have been approved for bonus density under the program – 10,000 square feet for the Navy League’s new building and 16,000 square feet for the headquarters of the National Rural Electric Cooperative Association. This summer, the county approved a residential tower that will be the largest green condominium building in the region, rising 27 stories. The project is designed to earn the minimum LEED rating.

All site plan projects in Arlington are required to submit a LEED scorecard, regardless of whether a developer requests bonus density. “We request developers to incorporate a certain number of green building components, even if they are not getting LEED certification,” says Kelsch.

If developers do not pursue LEED certification, they must contribute 3 cents per square foot of their project to a green building fund. The money is used for education and outreach activities, such as developing a program brochure and offering tours of green buildings.

“The learning curve is steep for developers,” says Kelsch. However, the green building requirements have not scared away developers from Arlington’s popular real estate market.

For more information on Arlington County’s green building program, visit www.co.arlington.va.us and enter “Green Building” in the search field.

continued from page 3

Wisconsin

have an impact on the market,” Hynek says.

While homeowners purchased the vast majority of CFLs during the “Change A Light” promotions, the program did not limit the number of bulbs per customer. Apartment managers in Wisconsin could buy CFLs, with no limits on quantity purchases, for about \$2.50 a bulb. Subtract from that the \$1.50 instant incentive per bulb, paid to the retailer and passed on to the customer, and the price of the energy-efficient product ceased to be a noteworthy barrier to either retailers or purchasers. The incentive was \$3 per bulb in the 2002 promotion, but declining wholesale prices allowed the incentive to be reduced without hurting sales.

The Division of Energy – the Rebuild America statewide partner in Wisconsin – could commit to such substantial incentives because it deploys funds from a state “system benefits charge,” a surcharge on electricity consumption. The “Change A Light” program cost about \$3 million in incentives for 1.3 million bulbs.

Changes in Apartments

Focus on Energy also has recently wrapped up a program of in-apartment CFL installations. To make sure the new bulbs actually were swapped for incandescent lights rather than being set aside in a store room, Focus on Energy paid two contractors who were chosen through competitive bidding to install bulbs. Even at a total cost of about \$7 a bulb, the resulting energy savings are cost-effective,

“When you drive that sort of volume, you are going to have an impact on the market.”

Hynek says. The program also allowed the state to provide some benefit directly to lower-income households, who are more likely to rent than to own their home.

The two contractors installed more than 22,000 CFLs and water-saving devices from March through June of this year. Shower heads and aerators that save water also save energy by reducing the volume of water that requires heating.

Wisconsin’s studies show that the average apartment CFL is a light three and a half hours per day and saves money even at a \$7 cost per bulb because of the combination of longer life and greater efficiency. CFLs last about 10 times as long as typical incandescent bulbs, and that alone makes their cost at \$7 a break-even proposition when compared with incandescent lights. But they also consume much less energy – saving up to 75 percent on energy consumption.

For more information, contact Don Hynek, Wisconsin Division of Energy, 608-266-5549, email don.hynek@doa.state.wi.us.

Faculty Helps Save Energy at Michigan State

On some college campuses, the professors and the facilities managers may seem to operate in parallel universes, one focused on educating students while the other takes care of buildings and infrastructure. But at Michigan State University, faculty in construction and facilities management have provided administrators and building managers with a series of detailed analyses and recommendations to enhance energy efficiency on campus.

“We’re working very closely with the residence hall system,” says Tim Mrozowski, an architect and professor in Michigan State’s Construction Management Program and a member of the faculty group studying and proposing changes. “They have embraced our efforts. We meet on a frequent basis with the director of the residence hall system.”

The collaborative effort started after a faculty group responded to a request for proposals from the university’s Physical Plant Division. The proposal submitted by the group was for an assessment method to develop an understanding of energy consumption patterns as a basis for identifying ways to increase energy efficiency.

After studying a general-use academic building and the chemistry building, the group teamed up with Rebuild Michigan to form Rebuild Michigan State University, a partnership concentrating on energy efficiency in residence halls.

Michigan State spends about \$36 million a year on direct energy costs. Of that, about \$5.7 million is for residence halls. After detailed reviews of building technologies, management, appliances and occupant behavior, the faculty project team is at the stage of trying to get its recommendations implemented and documented.

Systematic Approach

Throughout its energy efficiency efforts, the research team has been methodical and detailed, the goal being to systematize improvements to campus buildings. The team did not want to make unrealistic proposals. Part of the study, for example, distinguished electricity consumption by occupants versus general building use of electricity, to clarify the picture of

different routes to energy savings – occupant behavior modification, administrative changes, capital improvements.

The methodical approach also should allow the Michigan State team to provide a record of a process that can be followed by other universities.

The project team for the study of residence halls is led by Mrozowski; David Lawrence, an assistant professor in the university’s graduate program in facilities management; and David Johnson, a professor of fisheries and wildlife.

The professors and student participants conducted introductory energy audits of 10 residence halls, then walk-through studies of five of those halls, then detailed technical and user studies of Wonders Hall, a six-story, 359,674-square-foot, 40-year-old building. That was followed by recommendations on managerial policy, technology and an energy awareness campaign for occupants.

Projects and Education

The study team made a long string of recommendations. The proposed changes are intended to reduce energy consumption by 20 percent – 10 percent through capital improvements, 5 percent through managerial changes and 5 percent through an energy awareness campaign to modify occupant behavior.

A sampling of proposed managerial changes: establish an integrated energy management plan; designate a staff position to lead the effort; designate in each building an “energy manager”; downsize or eliminate rarely used computer labs in residence halls; consolidate cafeteria operations into fewer buildings; consider performance contracting;

consider adopting a “business model” approach to residence-hall management. As an aside, it should be noted that the University of Arkansas at Fayetteville adopted a business model for its campus utilities to help implement a master plan. (*EnergySmart Update*, July-August 2003.)

A sampling of proposed technology changes: install motion detectors or timers to control lighting in student lounges, bike rooms, building service spaces and crawl spaces; change



Students assisting in energy study watch as daylight is measured by Lynda Boomer, an electrical engineer with MSU Engineering and Architectural Services.

TECHNOLOGY

Microturbines Turn Landfill Gas into Electricity

Microturbines are an increasingly popular source for on-site power. One market for these compact generators is landfills, which emit methane. While tapping into this energy source can be a win-win situation, the projects pose unique challenges.

Modern landfills are not simply holes in the ground where we toss our garbage. Government regulations require environmental impact studies, clay or plastic barriers, and other means to protect the surrounding air, water and land.

Refuse is regularly covered with clay or dirt to limit its exposure to air. In the oxygen-deprived environment, bacteria break down the waste, producing methane and carbon dioxide. To prevent landfill gas from building up and causing an explosion, landfills incorporate pipes to collect the gas and flare it off.

According to the U.S. Department of Energy (DOE), more than 350 landfills tap into this source of energy to power reciprocating engines, turbines, microturbines and other energy technologies.

Capstone Turbine, a major manufacturer of microturbines, has sold more than 100 units to landfills across the country, an expanding market according to Kurt Naas, vice president of marketing and business development.

Cleaning Up the Fuel

Landfill gas must be cleaned of siloxanes before being piped into combustion engines, including microturbines. Siloxanes are silicon-oxygen-methane compounds formed when cosmetics, shampoos and deodorants decompose.

“The problem with them in the fuel is that at high temperatures the carbon and the hydrogen combust, leaving the oxygen and the silicon to form silicon dioxide, a.k.a. sand,” explains Joe Lenzi, energy manager for Chesterfield County, VA, a Rebuild America partnership. “You can



The set of microturbines at an Antioch, IL, high school, using landfill gas.

imagine that this is not a good thing to have in the fuel supply of what is essentially a jet engine.”

The problem is not unique to microturbines, says Naas. Siloxane compounds can also damage reciprocating engines.

The cost of cleaning landfill gas depends on the amount of siloxane compounds as well as heavy hydrocarbons. Lenzi discovered that removing the siloxane compounds from the Chesterfield County landfill gas would cost about \$120,000, which more than doubled project design estimates. It proved to be too expensive for the county's 25-acre landfill, which produces gas at a rate of 300 cubic feet per minute. In

Continued on page 8

Before You Decide...

Large landfills can hire contractors to design, build, own, operate and maintain landfill gas/microturbine projects. Smaller facilities, such as those producing less than 1,500 cubic feet per minute of landfill gas, may not emit enough methane to justify the cost. Joe Lenzi, energy manager for Chesterfield County, VA, suggests answering the following questions before investing:

- Can the microturbine run on landfill gas?
- What volume of gas flow does the landfill produce?
- What is the expected duration of the gas flow?
- What is the content of the gas? (How much siloxanes?)
- What is the on-site and immediate off-site demand for electricity?
- How much will it cost to connect to the local utility grid and sell electricity into a wholesale market?
- Who will manage the sales if you connect to the grid?
- Who will maintain the gas conversion/power generation system and what will it cost?
- Would a reciprocating engine be more appropriate?

TECHNOLOGY

Time Ripe for Heating with Condensing Boilers

In Europe, condensing boilers have been widely used for some time in space-heating systems, especially for apartments. They cost substantially more than conventional boilers, but they are 10-15 percent more efficient. High prices for natural gas in Continental Europe have justified spending the extra money on the better equipment. Gas prices in the United States, by contrast, were low through much of the 1980s and 1990s.

Times have changed. In the United States, the market for boilers may be ready for the better technology – and the market is getting a helpful push from Wisconsin's Apartment and Condo Efficiency Services (ACES) program, operated by the state's Focus on Energy program. ACES provides expert analysis and financial incentives to encourage switching to condensing boilers.

One indicator that the condensing boiler's time may finally have come in the United States is the fact that most boiler manufacturers have added the technology to their product lineups, says Don Hynek, multifamily program manager in the Wisconsin Division of Energy. Such companies as Heat Transfer Products, AERCO International and the Patterson-Kelley unit of Harsco all tout their condensing boilers.

Using Exhaust Gases

A conventional boiler allows some energy to be wasted in combustion exhaust. A condensing boiler runs the heated exhaust gases – a mix of carbon dioxide, oxygen and water

“That is one of the things we had to swim upstream against the most – an enormous amount of skepticism.”

vapor, for the most part – through a secondary heat exchanger, where the vapor condenses to liquid. Condensation releases latent energy, adding more heat to the water pipes and boosting the efficiency of the system. A booster fan assures that exhaust is vented and fresh air is pulled into the burner. The exhaust is so cool that it can be vented out the sidewall of the building through a polyvinyl chloride (PVC) pipe, just like a high-efficiency furnace.

This controlled-combustion air flow eliminates another energy-wasting feature – the window-size opening required in every boiler room holding a conventional boiler. Boilers need a large free flow of combustion air. It isn't unusual for a moderate-size building to have four square feet of combustion air opening, required by law to be unrestricted all winter, even when the boiler is not operating.



Six condensing boilers are installed in a Madison, WI, apartment building. Two of the boilers are dedicated to water heating and tied to big water tanks.

A “modulating” condensing boiler is even more efficient. It automatically adjusts the flow of fuel and air to the combustion chamber, reducing the fuel flow and burner output when heat demands are low.

While a conventional boiler typically achieves an efficiency of about 70 to 75 percent, a condensing boiler will exceed 90 percent and may exceed 95 percent.

Another valuable trait of many condensing boilers is small size (50,000 to 300,000 Btu per hour and the size of a coffee table). Buildings that might have one massive conventional boiler can be heated with half a dozen small condensing boilers. In very cold conditions, all of the boilers might come on, but more typical temperatures might require only two or three boilers to fire. Just as important, having multiple boilers means that the building still has heat even if one boiler fails.

“That’s a feature that landlords love,” says Hynek. “When they learn that they can practically eliminate the chance of getting that ‘no heat’ call in the middle of the night, the light bulb goes on. Not only is that call a huge hassle for them, but it costs hundreds of dollars if they need to get their heating contractor in on an emergency basis.”

All of these features aren't free. A system of modulating, condensing boilers for a moderate-size building can cost thousands of dollars more than a conventional system. In Wisconsin, a condensing boiler system typically costs approximately \$500 more per apartment than a conventional boiler. Average energy savings of \$100 to \$200 per unit per year yield a simple payback of 2.5 to five years.

The cost efficiency can be boosted by getting the boiler to do double duty. “We’ve found that a useful way to get cost-effective, very efficient apartment buildings is to use one

continued from page 6

Microturbines

general, clean-up costs should be less than one-third of total installation costs.

Need Electricity?

A key component to a successful landfill gas/microturbine project is proximity to industrial or other 24-hour facilities with significant power needs, because landfills themselves do not require much energy.

In Antioch, IL, gas from a local landfill powers 12 Capstone microturbines in a combined heat and power (CHP) system at a nearby high school. A new half-mile-long pipe transfers treated and compressed landfill gas to the school. The payback period is eight years, thanks to the efficiency of the CHP setup and a \$550,000 grant from the Illinois Department of Commerce and Community Affairs' Renewable Energy Resource Program.

In Chesterfield County, there are no heavy electricity users nearby. Selling power to the local utility is not cost-effective for the county either, Lenzi says. If you send power to the grid, you are likely to receive only the wholesale price for electricity, and there may be fees associated with the hookup.

Maintaining a microturbine is another important consideration for landfill gas projects. "You can't just flip through the yellow pages and find a mechanic," says Lenzi.

Maintenance for Capstone's microturbines is recommended every 8,000 hours, performed by the company's technicians or affiliated contractors. Air filters need to be cleaned or changed regularly because landfills are dusty environments.

Flexibility

Eventually, the volume of gas that a landfill produces will diminish. Microturbines are more flexible than other technologies, though. With an array of microturbines, you can stop running a few, switch to utility-supplied natural gas or move them to another location.

Although Chesterfield County could run their microturbine on landfill gas at a loss, they are instead exploring the option of operating it at a wastewater treatment facility. The biogas that the plant flares off is mostly free of siloxanes, and the plant consumes a lot of electricity, making it well-suited for a microturbine.

For more information on microturbines and landfill gas projects, visit DOE's Distributed Energy Program at www.eere.energy.gov/de. Also visit the Web site of the U.S. Environmental Protection Agency's Landfill Methane Outreach Program at www.epa.gov/lmop, and www.capstone.com.

continued from page 5

Michigan State

fluorescent lights to T-8s with electronic ballasts; change exit signs to light-emitting diodes (LEDs); use variable speed drives for fans; consider adding window films to south-facing windows.

The proposal for an energy awareness campaign quickly became a reality. An ENERGY STAR® display unit was created in a residence hall to use with orientation programs, educating newcomers and their parents. The study team had found that students have large numbers of appliances, making energy awareness an important part of an energy efficiency campaign.

More research is in the works. The faculty team will study vintage buildings on campus to propose another set of energy efficiency ideas. Michigan State, like many older campuses, has many buildings dating back to the 1920s and 1930s, usually the more attractive buildings that people want to preserve.

Informational activities also are on tap – training for management and building staff.

For more information, contact Tim Mrozowski, 517-353-0781, email mrozowsk@egr.msu.edu.

continued from page 7

Boilers

combustion system to generate both space heat and domestic hot water," says Hynek.

Wisconsin's Focus on Energy not only provides apartment owners with custom analysis on boilers but offers to pay an incentive equal to the first year's natural gas savings if an owner switches to condensing boilers. Nationwide, Rebuild America also has encouraged people to consider condensing boilers. Nevertheless, the initial cost and customer skepticism create market barriers.

"They're extremely skeptical," Hynek says of apartment owners. "People have been showing up for years offering them whiz-bang savings. That is one of the things we had to swim upstream against the most – an enormous amount of skepticism."

The energy analysis provided by the Focus on Energy staff is an important tool in the program's efforts. The involvement of a state program contractor, with no merchandise to sell, reduces customer doubts.

For more information, contact Don Hynek, Wisconsin Division of Energy, 608-266-5549, email don.hynek@doa.state.wi.us.

continued from page 1

Albuquerque

The housing officials can breathe easier about it now. In the spring, the city council gave its permission – in a split vote, with a few skeptics still opposed – for the launching of a \$1.62 million set of energy and water retrofits in three buildings.

A 12-year performance contract valued at \$974,929 was signed with energy service company Citizens Conservation Services, a unit of Ameresco, which is a Rebuild America Business Partner. The contract provides a guarantee of savings, as is typical in performance contracts. If the savings fall short, it will be the service company's obligation to make up the difference.

The city will pay \$600,000 up front, and utility incentives will provide \$48,000.

"It's so important that you have a task force," Martinez says, reflecting on the effort that went into providing detailed

The performance contract will allow the public housing authority to conserve funds for other work, including badly needed upgrades for elevators.

explanations of the plan. "If it's left to one person, they'll drop it in a minute."

One person might easily have been frustrated from the start. "We found a lot of little walls being put up, but we went right through them," Martinez says.

In the summer, Citizens Conservation Services was sorting through subcontractors for the work, which was expected to begin in the autumn.



The retrofits will improve energy and water efficiency in two big public housing facilities and the housing authority's headquarters office building. The two big public housing units are Embudo Towers,

containing 101 units and 86,233 square feet, and Wainwright Manor, with 62 units and 61,050 square feet. Fluorescent lighting will be converted to T-8 lamps and electronic ballasts from the less-efficient T-12s and magnetic ballasts. In some public areas, controls and occupancy sensors will be added to switch off lights when not needed. Chillers and other equipment will be modernized in HVAC systems, also with controls where needed. Low-volume "pressure-assist" toilets will be installed to reduce water use.

The city estimates the retrofits will achieve annual



Wainwright Manor, above, a public housing complex in Albuquerque, will be retrofit for efficiency. The same will be done for Embudo Towers, below left.

reductions in electricity costs by 28.4 percent, water costs by 24 percent and natural gas costs by 13 percent. Annual energy savings would come to more than \$90,000. Including water conservation, total annual savings would exceed \$130,000.

The performance contract will allow the public housing authority to conserve funds for other work, including badly needed upgrades for elevators.

The public housing authority wants to modernize lighting, HVAC and plumbing in its other complexes, too. For that work, the authority is thinking of asking companies to bid on two separate contracts – one for electrical contractors, one for HVAC and plumbing contractors.

For more information, contact Fernie Martinez, Albuquerque public housing manager, 505-764-3963, email fmartinez@cabq.gov.

Rebuild America Progress Calculator

Number of Partnerships:

696

Total Number of Committed or Completed Square Feet:

1,560,007,912

as of September 17, 2004

Web Site Update

In the Rebuild America Web site, visitors can find presentations given at Business Partner technical seminars. The seminars are held around the country to spread knowledge of energy efficiency and renewable energy. The seminars tap the great expertise of Business Partners on how to design, retrofit and operate buildings. Following are some of the seminars held this year. Their presentations can be found under the “Seminar Proceedings” heading on the Business Partners page, www.rebuild.org/partnerships/business.asp.

Energy Projects: Planning and Technologies Seminar, June 22 in Kansas City. Posted presentations include:

- What is an Energy Project
- A Primer on Building Controls
- Lighting Technology Update
- System Commissioning

Higher Education Energy & Environmental Conference, June 18 in Cookeville, TN. Posted presentations include:

- Benefits of Underfloor Air Distribution Systems
- Developing Water Conservation Initiatives for School Systems
- Lighting and Workspace Controls
- Lighting Technology

Energy & Environmental Technologies for Businesses, June 8 in White Plains, NY. Posted presentations include:

- Introduction to Performance Contracting
- Introduction to Solar
- Cogeneration: Combined Heat and Power (CHP)
- Small Business: Energy Audit Program
- Energy Efficient Lighting Technologies

Advanced Design & Technologies for K-12 Schools, May 27 in Richmond, VA. Posted presentations include:

- Modeling High Performance Schools
- HVAC in High Performance Schools
- Commissioning for High Performance Schools
- Electric Lighting
- Energy Performance Contracting in Virginia
- Site Planning and Water Conservation

Integrated Building Controls Technology, May 19 in Irwindale, CA. Posted presentations include:

- Mechanical Controls
- Lighting Controls
- Total Building Controls

Upcoming Events

November

- 3** **Lighting for Tomorrow**, presented by Southern California Edison (SCE) and Rebuild America. SCE Customer Technology Application Center (CTAC), Irwindale, CA. Contact CTAC at 1-800-336-2822.
- 10** **Commissioning Seminar**, presented by Rebuild America and the Ohio Office of Energy Efficiency. Holiday Inn French Quarter, Perrysburg, OH. Contact Emmanuel (Manny) Anunike at 614-466-4092 or email eanunike@odod.state.oh.us.
- 10-12** **Greenbuild International Conference and Expo**, presented by the U.S. Green Building Council. Oregon Convention Center, Portland, OR. Visit www.greenbuildexpo.org.
- 16** **Rebuild America Northeast Regional Peer Forum**, Omni Parker House, Boston, MA. Contact Greg Davoren at 617-565-9706 or email greg.davoren@ee.doe.gov.
- 17** **Rebuild America Business Partner Development Meeting**, GE Lighting Institute, Cleveland, OH. Contact Jessica Barry at 845-331-2238 or email bpteam@verizon.net.
- Energy Technology Seminar for Restaurants**, Sierra Pacific Power Company Auditorium, Reno, NV. Call 866-638-7232 or email registration@nsbdcbe.org.
- 18** **Energy Technology Seminar for Restaurants**, Henderson Convention Center, Henderson, NV. Call 866-638-7232 or email registration@nsbdcbe.org.
- 19** **Rebuild America Business Partner Development Meeting**, Sarnafil Inc., Canton, MA. Contact Jessica Barry at 845-331-2238 or email bpteam@verizon.net.
- ### December
- 14-17** **Emissions Reduction and Energy Leadership Summit 2004**, Henry B. Gonzalez Convention Center, San Antonio, TX. Visit www.sanantonioenergyleadership.org.

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

The Watt Stopper Expands and Innovates

The Watt Stopper started as a maker of occupancy sensors, but like the energy technology markets themselves, it has grown and matured considerably. Now the company provides customers with a complete suite of lighting controls for all kinds of government, school, commercial and industrial applications.

“We’re not just a sensor company, we’re a controls company,” says Dorene Maniccia, the company’s manager of market sector development.

The Watt Stopper also is very active in Rebuild America educational workshops and seminars. Lighting is a large percentage of the energy expenses in buildings, and The Watt Stopper has the expertise to explain how those expenses can be reduced.

It is an adaptive and innovative company. Consider the special case of hotel bathrooms, where travelers often leave lights on all night to serve as night lights. To make it worse, those lights may be forgotten and remain on when people leave the hotel room during the day. One of The Watt Stopper’s control systems includes an occupancy sensor and a high-efficiency LED (light-emitting diode) light tailored to that special situation. When a bathroom has been unoccupied for some set period of time – perhaps 15 minutes – the regular light in the room is shut off and the LED light comes on. That’s energy saved and money saved.

Other innovations are a matter of convenience. Most people like being able to turn on a television set or music with a remote, for example. The Watt Stopper can provide customers with a handheld remote for setting up and adjusting a dimming photosensor.

First Came Two Brothers

The Watt Stopper was founded in 1984 by Jerry and Steve Mix. The brothers started with infrared occupancy sensors, then expanded over the years into automatic wall switches, ceiling sensors, ultrasonic motion detectors, dual-technology (infrared and ultrasonic) sensors, daylight sensors (connected to dimmers, so that artificial lighting is reduced as daylight grows) and increasingly sophisticated controls.

Controls can range from a simple timed switch to an elaborate system integrated into a full set of building automation. A Watt Stopper lighting control system can be managed from the same computer station that controls a building’s heating, ventilation, air-conditioning, security and other systems.

Sometimes the challenge isn’t to control the light of a whole room but to illuminate a workstation. Because many



workstations are loaded with equipment, The Watt Stopper offers a task lighting control system called Isolé that combines occupancy sensors with surge-

suppressing power strips to manage desktop plug loads.

At the big headquarters building of the Aid Association for Lutherans, more than 2,000 Isolé units not only control the task lights at workstations but other desktop equipment, including monitors, calculators, microfiche readers and pencil sharpeners. The association’s director of downtown building operations expects annual cost savings of \$12,000 thanks to the control system.

The Rest of the Picture

Clever devices are not the only things offered. Support services also are important. The Watt Stopper provides customers with design consultation, engineering, layout, calibration and troubleshooting.

Because applications can vary so widely, the company will provide a control solution tailored to the needs of the customer – an office building, a hotel, a factory, a school, a university campus and other settings.

Knowledge is the most useful of tools, and The Watt Stopper spreads knowledge of energy-efficient lighting technologies partly through such venues as the technology seminars of the Rebuild America program.

For more information about The Watt Stopper, visit its Business Partner entry at www.rebuild.gov, or visit the company’s Web site at www.wattstopper.com.

Premier Business Partners

Acuity Brands Lighting	Sarnafil 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
NORESCO	
OSRAM SYLVANIA	

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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.

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New Partnerships

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Canby School District, OR

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Virginia Tech, VA

Jacksonville Center, VA

Malama Learning Center, HI

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Roanoke, City of, VA

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Western Kentucky University, KY



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

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



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.

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