

PARTNER UPDATE

Weatherization and Intergovernmental Program

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Rural Idaho Schools Turn to Performance Contracts to Save

Several small school districts in Idaho are financing capital improvements through energy performance contracts. By paying for improvements through future utility savings, these schools are improving learning environments without breaking their budgets.

Jerome School District, about 100 miles southeast of Boise, teamed up with Rebuild America last year to pursue energy-saving improvements by using performance contracting. Rebuild Idaho, which introduced the rural school district to Rebuild America, provided assistance with the request for contractor qualifications. The school district signed a contract with an energy services company (ESCO), Chevron Energy Solutions, to improve mechanical systems and install energy-efficient lighting.

The mechanical and lighting improvements, which were completed last winter, are estimated to produce 25 percent savings annually.

At the middle and high schools, T-12

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The administration building at Texas A&M University's main campus.

Texas A&M Campus Tune-Up Conserves Energy and Money

Texas A&M University's main campus is about a mile square, serving 44,500 students, a population larger than many American towns. With 15 million square feet of building space, the university has enormous energy requirements. To contain energy costs, Texas A&M invested in building control upgrades and utility plant retrofits. Additionally, the university implemented a commissioning program that has achieved Texas-sized savings by optimizing the operation of campus utility plants and building energy systems.

Commissioning involves testing, monitoring and adjusting a building's HVAC, controls and other systems to ensure high-performance operation. It's the building equivalent of an automobile tune-up. The process can be applied to newly constructed or existing buildings, as well as to central utility-plant operation.

Bahman Yazdani, with Texas A&M, explains that buildings often go through various changes that affect operational requirements. The building may have fewer occupants, the energy management system could be different, or energy-efficient windows may have been installed. These, along with a number of other changes, need to be taken into account to ensure that a building's systems are operating at their best performance.

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Idaho Schools

fluorescent lamps with magnetic ballasts were replaced with more efficient T-8 lamps with electronic ballasts. Energy-wasting incandescent light bulbs were replaced with compact fluorescent lights.

The ESCO would only guarantee savings if the school district hired an onsite Resource Conservation Manager (RCM) to monitor HVAC systems and adjust controls to ensure optimum operational efficiency.

Rick Ames, the RCM, walks through the facilities each day to verify that systems are working properly. Twice a month, Ames meets with a representative from the ESCO to receive ongoing training. He also searches for additional opportunities to save energy and encourages staff to look for and reduce unnecessary energy consumption.

The behavioral portion of the performance contract is estimated to reduce energy costs by an additional 5 percent each year.

Outside of the performance contract, Ames, who also serves as the school system's maintenance director, has been saving energy at an aging elementary school by reducing excessive lighting. Because the school may be replaced

within ten years, it was not included in the performance contract. Ames used a light meter to identify areas of the school that were over-lit and then reduced the lighting in those spaces. Last year, 25,000 watts of lamps were removed. The school district also de-lamped 19 vending machines, and removed one that was seldom used, to save more energy.

The school district is also expanding the library at its high school by 6,000 square feet, financed through a gift from Evelyn Crowder, who included the school district in her will. Crowder – who had been a teacher in California, but retired in Idaho – bequeathed \$1 million to the school district for the library.

Ames, working with LKV Architects of Boise, is advocating a design that can meet the requirements of the LEED (Leadership in Energy and Environmental Design) Green Building Rating System™. He envisions the addition as a model for energy-efficient building for the school district. Preliminary plans call for high-performance windows, extra insulation in the walls and ceiling, and an abundant use of natural light. Ames explains that this will reduce operational costs for the addition.

For more information, contact Sue Seifert at sseifert@idwr.state.id.us.

School Design Guidelines Honored

The *Energy Design Guidelines for High Performance Schools* have been recognized with a communications award from the International Association of Business Communicators (IABC), U.S. District 5. The design guidelines – seven booklets that address energy-efficient design for specific climates – received a Silver Quill award at a ceremony on October 2 during the IABC U.S. District 5 conference in Austin, Texas.

The guidelines, and the supporting technical document *National Best Practices Manual for Building High Performance Schools*, were released last year to help K-12 schools improve learning environments through energy-saving design. Each publication is written for architects, planners, administrators, facility maintenance professionals and others who influence design decisions for new school construction and renovation. They were developed by the National Renewable Energy Laboratory with subcontractor Innovative Design and the assistance of a host of specialists inside and outside government.



The booklets and manual can be downloaded separately via the Rebuild America Web site at http://www.rebuild.org/sectors/k12_resources.asp.

They also are available on a single CD through Rebuild America at http://www.rebuild.org/lawson/SC_attachmentView.asp?attachmentID=1440.

Students Save Energy in Schools Across U.S.

The students patrol rooms and corridors in search of energy waste. They stop what waste they can – such as by lowering thermostats to their best settings – report what they find, analyze energy consumption and propose operational and technological improvements. In elementary, middle and high schools around the country, students are making large and small differences that save energy and money.

Equally important, they are learning. Some of them may go on to become the energy technologists and energy-efficient managers of tomorrow.

Three Rebuild America Strategic Partners especially contribute to these EnergySmart Schools extracurricular programs – the National Energy Foundation (NEF), the National Energy Education Development (NEED) Project and the Alliance to Save Energy (ASE). A Business Partner, Johnson Controls, also is active in supporting such programs, especially in collaboration with NEF.

Hundreds of Patrols

The student activities probably are far more widespread than most people realize. NEF reports that there are hundreds of student energy patrols functioning around the country on their own. NEF tracks its training of educators, but no one tracks the nationwide energy-efficiency activities of students outside of classroom assignments.

Every now and then, the student work captures the attention of others. Earlier this year, *American School Board Journal* honored Pasco County Schools in Florida with a Magna Award for the school district's "energy patrol" program, involving about 500 students in elementary and middle schools. The Pasco school district is a Rebuild America partner through the Educational Energy Managers Association of Florida.

In Arkansas

Demonstrations of the value of the programs keep appearing. In Arkansas, a two-year program of student patrols has documented energy savings of more than \$21,000 in five elementary schools. The program was the work of the Arkansas Energy Office, Rebuild Arkansas, Johnson Controls and NEF.

Here is how Markey Ford, energy education coordinator of the Arkansas Energy Office, describes the program activities:

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View From DC

by Daniel Sze

If anyone needed a reminder of the value of energy efficiency, they got it Aug. 14 when a massive blackout cascaded through the U.S. Northeast and Ontario.

Although the Northeast grid wasn't at peak demand regionwide that afternoon, a regional average is beside the point. All that is necessary for such a blackout is that *some* parts of the grid be overstrained. When a few generators or transmission lines shut down, power load is transferred to other nearby parts of the grid. If spare capacity is inadequate in those nearby segments, they in turn can be overburdened and shut down. The cascade gets rolling.

There are two ways to make sure enough spare capacity is maintained to minimize the risk of blackouts: Build enough power supply, and restrain demand via energy efficiency.

Look at what Rebuild America is doing in northern Ohio, and think about what could have been prevented if our projects were multiplied sufficiently.

In Canton, virtually the epicenter of the blackout, the Stark Metropolitan Housing Authority has been reducing energy use while keeping residents comfortable in public housing. Efficiency measures there are saving 1.7 billion Btu annually.

Also in Canton, microturbines in a school swimming facility are demonstrating what can be done with smart forms of distributed generation. In a project partly funded by DOE, two microturbines installed this year in the C.T. Branin Natatorium can generate 56 kilowatts of electricity while their exhaust heats pool water and drives a part of the building's air-conditioning system. That combined heat and power (CHP) approach makes the microturbines far more efficient than otherwise. DOE's EERE focuses on distributed generation as part of its electric reliability program.

In Cleveland, a 92-year-old office building was retrofitted by the Cleveland Green Building Coalition. It appears to be likely to achieve an energy efficiency 67 percent greater than what would have resulted from a conventional renovation.

Multiply such government and private-sector projects enough times and they will make a difference. They will not stop tree branches from falling on wires, nor will they make every valve at a power plant function smoothly, nor will they bring an end to human error. But by reducing the burden on the power system in one community after another, they will add to the margin of safety keeping all of us in the light rather than the dark.

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

Wisconsin Program Makes a Big Splash with Water Treatment

The Wisconsin Department of Administration's Division of Energy never dreamed that success could come so quickly in the water and wastewater treatment sector.

As operator of the Focus on Energy public benefits program – the partnership for all Rebuild America activity in the state – the division had the challenge of creating market transformation in this historically overlooked sector. The key was to involve those who could benefit most. Trade organizations and vendors were waiting for an opportunity like this. The Division of Energy merely created the infrastructure to set it in motion.

With energy costs rising and state payments to local governments decreasing, saving energy is an effective way to cut costs for a critical operation where product quality cannot be compromised.

Oversized, Underautomated

Through a series of visits to facilities across the state, Water and Wastewater Program lead Joe Cantwell quickly realized how beneficial the program could be.

"Many of the facilities I visited were using oversized equipment designed to meet peak load demands, with no way of efficiently scaling back the operation on a typical day," he said. "Some plants were oversized as much as 50 percent."

Additionally, Cantwell found that automated control systems were often outdated or did not exist at all.

The participating facilities each received descriptions of plant improvements that would save energy, and most have chosen to install at least some of the equipment recommended by Focus on Energy. Many of the program's best suggestions have been incorporated without a large capital expenditure.

During presentations, Cantwell would ask for a show of hands about how many operators reviewed their monthly utility bill, often finding less than five in 100 would raise their hand. It turned out that most administrators in a water utility would just pay the bill, and the operator would never see it. Cantwell made it a priority to convey the importance of demand-side management.

Another key to setting up a successful program in this sector is to get one project completed to show the benefits

to others via case study. Word of mouth advertising was very effective in communicating program benefits in this small and targeted sector.

However, there are always barriers to overcome. The largest barrier may be the reduction of state subsidies to local government operations to cover budget deficits. Most local governments are extremely cautious about making large capital expenditures in this financially constrained era. Paybacks of three years are considered too long even though the operation will run 365 days per year for at least a generation of their citizens.

Nevertheless, getting one project written up with verified energy and economic savings details, preferably monitored, will go a long way toward helping to convince a utility board to move forward with the best practices.

"This program is a win-win for local taxpayers by reducing operating costs, thereby reducing local property taxes," says Peter Bock, Division of Energy administrator.

Including All Players

Due to the successes of the first Water and Wastewater Program participants, demand for program services quickly escalated. To meet the growing demand, Focus on Energy teamed with the non-profit Wisconsin Rural Water Association (WRWA), which adopted the newly created Focus on Energy best practices.

The program is being welcomed by municipal utilities, which are saving, on average, 30 to 65 percent on their utility bills, according to Terry Pease, program manager for

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BEST PRACTICES FOR EXISTING SYSTEMS

- Aeration system uses fine bubble diffusers
- Aeration blowers are automatically controlled using DO sensors and VSDs
- A heat recovery system is on anaerobic digester
- Aeration basins are shut off when not needed
- Aeration system is properly sized
- Aeration diffusers are arranged in the most effective way to meet loading requirements
- Anaerobic digester operating is at its optimum temperature
- Recover and use biogas from anaerobic digester
- Dewater sludge to make more biogas in the digester
- Have sufficient storage (flow equalization) for influent to minimize on-peak processing and use storage effectively
- Have an emergency premium efficiency motor replacement plan
- Pumps are sized correctly for their application and loading and system is optimized
- High-efficiency motors and matched pumps are a critical part of any life-cycle replacement strategy

TECHNOLOGY

EnergyPlus Software Works at Cutting Edge of Building Design

Advanced software for the design of energy-efficient buildings has reached a level of sophistication that allows designers to account for such factors as natural airflow through open windows and the light reflecting down light pipes. Those factors and more can be plugged into calculations using EnergyPlus, one of the latest products from Lawrence Berkeley National Laboratory (LBNL) and its partners in research and development.

LBNL teamed up with the University of Illinois at Urbana-Champaign and the U.S. Army Construction Engineering Research Laboratory to create the software, with funding from the Building Technologies Program within the U.S. Department of Energy's Office of Energy Efficiency and Renewable Energy.

Some of the simpler aspects of EnergyPlus could be used by architects, but the complexity of it makes it more of an engineer's program, says Dru Crawley of the Building Technologies Program.

Such complex software can rarely be justified for small buildings, according to Crawley. But it has much potential for Rebuild America projects and other work involving extensive renovations or new-building designs for large structures, he says.

Quite a few people obviously think it can be useful. More than 12,000 copies of EnergyPlus have been downloaded since it was released in April 2001. It helps that the software is free.

"The version that is on the street right now has over 3,200 users," Crawley adds.

Those users are scattered around the world. The software has been employed in the designs of a Holiday Inn in Shanghai, a hospital in Dublin and a Grand Hyatt in Beijing.

In the United States, a prominent application of EnergyPlus is in the design of a federal office building to be constructed in San Francisco. The results of EnergyPlus modeling will save \$9 million in energy over 20 years at that building, according to Tim Christ, project manager for the building's lead design firm, Morphosis.

Thanks to EnergyPlus, planners said, the building will rely primarily on natural airflow for ventilation and cooling, with office space and false ceilings designed to allow as much free airflow as practical. The building also will use exposed ceiling slabs to absorb excess heat during hot days and dissipate that stored heat at night when the air is cooler.

Along with such heat absorption and release, the software can incorporate moisture absorption and desorption. And for its various factors it can break down projections into sub-hourly time steps.

Other aspects of the software may be familiar to companies that have tried less-advanced design programs, such as the capacity to plug in local financial factors. Like any energy-use program, it can be adapted to utility costs, Crawley says.

A new version of EnergyPlus, designated 1.1.1, was released in mid-September. But it still does not have a highly user-friendly interface. Several companies are trying to develop graphical interfaces for it, and Crawley says, "I think that's going to help users more than anything else."

Crawley recently tried out the graphical interface being developed by a British company named DesignBuilder, and he was impressed, saying, "It was just amazing."

For more information, contact Dru Crawley, 202-586-2344, email drury.crawley@ee.doe.gov. To obtain a copy of EnergyPlus, visit www.energyplus.gov.

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Wisconsin Water

the Division of Energy.

Ken Blomberg, director of WRWA, realized the potential benefits for his members and allowed Focus on Energy to train his field staff. Equipment and service suppliers also welcomed the additional work being created.

"We saw it was vital to include all the players in this sector, allowing the ideas promoted by Focus on Energy to continue after the program has stepped out," Pease says.

On another front, Focus on Energy began working with the Wisconsin Department of Natural Resources in two areas:

new operator training and new facility design. With assistance from the state's technical college system, courses are being adapted to include energy-management curricula in certification training.

The Department of Natural Resources also agreed to allow a review of new-facility code compliance with emphasis on changing the 20-year growth plan to avoid the oversizing observed during facility visits.

"It became evident that we needed to change the 20-year plan to allow for system add-ons over time in proportion to a community's growth," concludes Pease.

For more information, call Focus on Energy at 608-266-8234 or visit www.focusonenergy.com.

TECHNOLOGY

DOE Researchers Build Houses Along the Road Leading Toward Zero Net Energy Consumption



A 12-foot by 12-foot, 8-foot-high test room under study in the ORNL Large Scale Climate Simulator.

Oak Ridge National Laboratory (ORNL) and two Building America project teams are monitoring a house they built that is stuffed to the rooftop with energy-saving technologies. It is the first in a planned series of six test houses with the goal of eventually building a structure that has zero net energy consumption.

The first house, a Habitat for Humanity home in Lenoir City, TN, is proving itself a champ. The average cost per day

The house's energy efficiency is about 50 percent "better than code," a short way of saying better than what would satisfy the International Energy Conservation Code.

was 87 cents for the first 304 days of careful monitoring – Nov. 15 to Sept. 9 – for all energy including plug loads for this 1,067-square-foot house, occupied by a family of four.

The house's energy efficiency is about 50 percent "better than code," a short way of saying better than what would satisfy the International Energy Conservation Code. That was the performance during those first 304 days of operation, says Jeff Christian, director of ORNL's Buildings Technology Center.

Two more test houses were under construction in September. For those, the intention is to achieve an efficiency 60 percent better than code. Another two houses are in planning stages, with the idea of boosting efficiency to 70 percent better than code. The sixth house is intended to attain zero net energy on an annual basis.

For all of the houses, corporate and Building America partners are making significant contributions, either in planning or contributing resources.

Single-family stand-alone houses are being built for the research, but many of the design concepts and technology components are applicable to multifamily housing and small commercial buildings within the domain of Rebuild America, says Christian.

Parts of the Whole

Christian stresses that the idea is to integrate compatible systems into a unified whole – to take a systems approach. But some of the centrally important elements are:

- Airtight envelope – roof, walls, windows and foundation
- Mechanical ventilation meeting ASHRAE standard 62P
- Ducts that are inside conditioned space
- Careful orientation along with placement and selection of energy-efficient windows

For airtightness, the first test house has structural insulated panels (SIPs) made of expanded polystyrene with a 1-pound density.

"SIPs are not the only way of getting airtight construction there," Christian says. He adds, "We have tested some 200 different types of wall constructions in our laboratory."

The SIP floor panels on the underside of the first floor have a white metal laminate, forming the ceiling of a crawl space. This

prevents crawl-space moisture from entering the house, provides a termite shield and easily reflects limited light in what is ordinarily a pretty dark space. The floor of the crawl space is sealed off from ground moisture by lapping and taping 6-mil plastic and caulking and mechanically fastening the ground cover to the walls and pillars.

Mechanical ventilation is automated, using a heat-pump two-speed indoor circulating fan that is very efficient at low speed. When the fan is not needed to assist heating or

cooling, it will stop. But to provide adequate fresh air to meet ASHRAE standard 62P, it will run 10 out of every 30 minutes during those non-heating, non-cooling periods.

Unique Water Heater

For air heating, ventilation and air conditioning (HVAC), the test house uses several heat pumps. But for water heating, it has something exceptional – a specially developed “drop-in” heat pump.

To make it an easy substitute for a conventional electric water heater, the heat-pump water heater uses an identical electrical hookup and a conventional hot water tank. It needs no additional plumbing or special skills for a plumber to install.

As a heat pump, it uses crawl-space air in the winter, which is tempered by proximity to earth – not quite a geothermal system, but close. In the cooling season it also is hooked into the back of the refrigerator and helps supply cool dehumidified air to the kitchen. It was provided by Enviromaster International. The company, based in Rome, N.Y., now makes the heat-pump water heater commercially available.

For one of the next two houses, Christian adds, a direct-exchange geothermal heat pump will be used for domestic hot water as well as air heating, cooling and dehumidification.

Solar Power Deal

The Tennessee Valley Authority pays the homeowner for the house’s rooftop photovoltaic output. TVA pays 15 cents



The first in a series of test houses draws an audience in Lenoir City, TN.

per kilowatt hour (kWh) for that power, in an area where the retail rate for electricity is 6.3 cents per kWh.

The utility is motivated by an interest in demand-side management, which sometimes is the most economical way for a utility to balance its supply and demand obligations.

The roof has a reflective surface. The solar panels are attached to a raised metal seam that is clipped to the roof. Solar panels attached directly to a roof or built into it tend to be too hot, Christian says.

On-site power generation is essential to achieve a “net-zero energy” goal, meaning a house that returns as much energy to the power grid as it takes off the grid.

Powerhouse Partners

In all of the work, ORNL stresses the importance of its partnerships. For the first house, it teamed with two Building America project teams, the Building Science Consortium and the Florida Solar Energy Center, a research institute of the University of Central Florida. And a host of corporate partners – Tennessee Valley Authority, Structural Insulated Panel Association, Metal Roof Alliance, Anderson Windows, Dupont and others – helped in the project.

For other houses in the series, ORNL will team with more Building America project leaders, including Integrated Building and Construction Solutions, the Consortium for Advanced Residential Buildings, consulting company ConSol and architectural and engineering company Steven Winter Associates.

For more information, contact Jeff Christian, ORNL Buildings Technology Center, 865-574-5207, email christianje@ornl.gov.



The second house being built in the research series, as it looked Sept. 24.

Low-Cost and No-Cost Changes Help Schools

Try turning some lights off.

It sounds too simple, too commonplace and obvious, to be part of an effective energy-efficiency program, but such matters as switching off unneeded lights – and computers, and other equipment – can save bundles of money.

The first, zero-cost steps toward saving energy and money are through operational change. A set of examples can be drawn from the recent effectiveness of two school districts in cutting their energy expenses.

Glenbard Township High School District 87, a Rebuild America partnership in the Chicago suburbs, is on track to save \$150,000 on energy over the course of a year after making changes that did not cost a penny.

Brevard Public Schools, a Rebuild America partnership on the Atlantic Coast of central Florida, saved more than \$750,000 on energy expenses in one year largely through no-cost operational changes.

Both districts were under financial pressure. Glenbard's board of education voted in February to cut the district's budget by \$1.58 million. In Brevard County, the board of education decided the system would have to find ways to cut utility bills by \$1 million.

Too Well Lit

Glenbard high schools already had been upgraded to T-8 fluorescent lighting, which is more efficient than the older T-12 lights. But when Larry Schoff, EnergySmart Schools sector technical analyst, toured two of the four high schools early in 2003, he noted that halls and rooms were very well lit regardless of need.

The school district began a policy of turning off lights and computers when not needed. It also reduced the number of lights. In overlit areas, the schools often removed fluorescent lights from each fixture, such as removing two lights from a set of four.

"It means less cost, less glare, less labor, fewer bulb replacements," says Bob Versario, director of buildings and grounds, who orchestrated the changes along with the assistant principals of operations at each school.

Maintenance foremen were trained in proper use of the computerized system for control of lights and air handlers, which can be cut back or cut off in unoccupied areas. Maintenance and cleaning staff were trained to turn off unneeded lights and equipment.

"Basically, what we did over the last six to eight months is educate people," Versario says. "It's a continual education. If you don't continually harp on it, the gains will go away."

The district next hopes to install occupancy sensors in

restrooms, locker rooms, storage areas, exercise rooms and most classrooms to turn lights off automatically.

After-Hours Action

Brevard County's public school system also changed the work of maintenance crews. Scheduling made a difference. When sections of schools are cleaned on regular schedules, air handlers can be switched off at predictable times.

Evening activities were scheduled differently to save



A Glenbard school hallway with more than 300 lamps, which were on all of the time.

money. By planning activities to coincide – for example, on one night of a week rather than three separate nights – energy requirements could be minimized on inactive nights.

Brevard, like Glenbard, also made a policy of switching off lights and computers when not needed. And education was stressed, not only for maintenance staff but for teachers.

For more information, contact Larry Schoff, 540-961-3117, email lschoff@rev.net.

Lights Out: When?

Frequent shutting off of lights will reduce lamp life, because there are only a finite number of starts in the cathode of a fluorescent lamp.

But according to lighting technologists, standard 30-minute or even 15-minute delays before shutoff for lights connected to automated controls and occupancy sensors will assure energy and cost savings. Since typical end-user electricity rates rose above about 7 cents per kilowatt hour, it has been worthwhile to shut off a fluorescent lamp even for as short a time as five minutes.

Think of it this way: The lamp cost about \$2. The energy savings can be as great as \$12-\$15 over the life of the lamp. Do you care if the lamp fails a bit early if you achieve those savings?

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Texas A&M

To address this situation on campus, Texas A&M turned to the Continuous Commissioning® program developed by its Energy Systems Laboratory. By assigning teams to regularly monitor and tune buildings and plant operations, the university is reducing its energy load while increasing occupant comfort.

The university began implementing the commissioning program in 1996 by installing metering devices in large buildings, the central utility plant and satellite thermal plants across campus. By monitoring the facilities and optimizing systems, the university has saved \$24.5 million since the program began. “These are actual, measured savings!” Yazdani says. Comfort-related complaints from building occupants have also been reduced.

The program was implemented at a cost of about \$5.6 million, including the essential metering, equipment replacement and repairs and new control elements, as well as on-going monitoring and analysis. Energy cost savings have averaged \$3.5 million annually, for a simple payback period of 1.6 years.

Beyond the Campus

The Energy Systems Laboratory (ESL), directed by Dr. W. Dan Turner, was the founding partner of the Brazos Valley Energy Conservation Coalition, one of the first partnerships formed under Rebuild America. The coalition – which included the Bryan Independent School District, City of Bryan, Texas Energy Engineering Service Inc. and Smart Energy Systems – was originally formed to help reduce energy in an eight-county region around the university.

“But people from all over the state – and out of state – wanted help,” explains Yazdani, “so they came to us.”

Beyond Texas A&M, the partnership has helped cities, counties, school districts, churches and higher-education institutions save money through commissioning. Using measurement and verification models, ESL analyzes buildings under various weather conditions and occupancy and then compares the results to actual utility bills. Each partner community or organization receives information on financing and implementing energy-saving improvements, as well as access to technical assistance.

The coalition has helped communities produce impressive results: 316 buildings have been retrofitted or commissioned, representing 15.4 million square feet of space. Over \$27 million in investments have produced nearly \$6.3 million in annual energy cost savings. Even if they don’t do a retrofit, 20 to 25 percent savings are possible through Continuous

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Students Save Energy



Students in Cabot Middle School South in Arkansas take part in energy-saving patrols.

“Teams wore Power Patrol vests while monitoring all classrooms, office areas, portables and storerooms at recess, lunch and before and after school.

When lights were found on, they were turned off. Classrooms were left with a “good job” or “needs improvement” doorknob hanger.

“This information was recorded on the daily check sheets and submitted to the teacher coordinator. The building was also checked for blinds open or closed appropriately, doors and windows left open or closed, dripping faucets, and thermostats at the proper setting.

“Students explored other energy problems by doing temperature comparisons of the windows, ceilings and floors; conducted an energy audit and reported the findings to the school boards at spring school board meetings, Energy Fairs and school-wide poster contests.”

In California

Student recommendations to school boards have made lasting differences. At Bemis Elementary School in California, students taking part in ASE-inspired observations recommended to the Board of Education that the color of the roof be changed to reduce air-conditioning demand. The board accepted their idea and provided money to paint the roof white, a color that reflects more sunlight rather than allowing the absorption of solar energy. Student activities at Bemis saved an estimated \$28,000 in one year.

In Rhode Island

At Park View Middle School in Cranston, RI, students in NEED-inspired activities studied their own school and concluded that the most economical method of improving its energy efficiency would be a lighting retrofit. Local utility Narragansett Electric-National Grid agreed to provide a rebate for the retrofit. Park View estimated energy savings of \$5,000 in the first year from the lighting changes.

For more information on how to establish an energy-saving patrol in your school, contact Blanche Sheinkopf, EnergySmart Schools sector coordinator, 321-779-3768, email bsheinkopf@energysmartschools.net.

LETTER TO THE EDITOR

HUD and Habitat

[Editor's Note: We encourage anyone with information or views on Partner Update subjects to write to us.]

Dear Editor,

In the May-June 2003 edition of *Partner Update*, the article "Building Homes with Habitat for Humanity" shines light on the efforts of organizations around the nation working to provide affordable housing to those who need it most. I commend the New York State Energy Research and Development Authority (NYSERDA) on partnering with Habitat for Humanity to build affordable, durable and energy-efficient homes in Brooklyn, New York. As I think your readers will agree, affordable housing is a national imperative.

That's why the Partnership for Advancing Technology in Housing (PATH), a HUD-administered program, also partnered with Habitat for Humanity to support the effort. PATH is a public-private initiative dedicated to accelerating the development and use of technologies that radically improve the quality, durability, energy efficiency, environmental performance and affordability of America's housing. PATH has been working with Habitat for Humanity-New York City to bring cutting-edge homebuilding science and advanced technologies to the Brooklyn row houses.

The PATH-profiled technologies incorporated into the homes include: fiber cement siding, water-saving plumbing, high-efficiency heating and cooling systems, nonpolluting paints, windows that block excess sun heat, and ENERGYSTAR® appliances. With these enhancements, along with additional technical support from NYSERDA, the row houses meet stringent requirements for the ENERGYSTAR Homes label.

The Brooklyn project is one in a growing list of collaborations between PATH and Habitat for Humanity to bring the many benefits of advanced homebuilding technologies to the affordable housing market. To learn more about PATH and its work on this and other projects, please visit www.pathnet.org.

Sincerely,
David Engel, Director
Affordable Housing Research and Technology Division
U.S. Department of Housing and Urban Development

Upcoming Events

November

- 4 High Performance Schools Training**, presented by the Collaborative for High Performance Schools. Sacramento Municipal Utility District Energy & Technology Center, Sacramento, CA. Visit www.chps.net/events/workshops.htm.
- 12-14 World Energy Engineering Congress**, presented by the Association of Energy Engineers. Georgia World Congress Center, Atlanta, GA. Contact Ruth Marie at 770-447-5083 or email info@aeeecenter.org.
- 12-14 Greenbuild International Conference & Expo**, presented by the U.S. Green Building Council. David L. Lawrence Convention Center, Pittsburgh, PA. Call 330-425-9330.
- 13 Energy Technology Seminar: Commissioning and Financing**, presented by Rebuild America and Southern California Edison. Customer Technology Application Center, Irwindale, CA. Call 1-800-336-2822.
- 19-21 National Association of Energy Service Companies Annual Conference**, InterContinental Hotel, New Orleans, LA. Visit www.naesco.org/conference.htm.

December

- 2 High Performance Schools Training**, presented by the Collaborative for High Performance Schools. Pacific Energy Center, San Francisco, CA. Visit www.chps.net/events/workshops.htm.
- 11-12 2003 Business Energy Solutions Expo**, presented by the Association of Energy Engineers. Ernest N. Morial Convention Center, New Orleans, LA. Contact Ruth Marie at 770-447-5083 or email info@aeeecenter.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.

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Texas A&M

Commissioning alone, according to Yazdani.

ESL is also providing support to the State Energy Conservation Office (SECO), which, along with Rebuild America and ENERGY STAR®, formed the Texas Energy Partnership. ESL is working with SECO to expand participation and tools available to Texas communities through the partnership. For example, ESL is providing technical assistance – including Continuous Commissioning – for Dallas-Ft. Worth Airport’s terminal renovations, as well as the City of San Antonio and Bexar County’s energy audits and facility improvements.

More Campus Projects

Back on campus, the university is moving ahead with additional energy projects. A pilot lighting retrofit project was implemented 18 months ago at the Engineering/Physics complex. T-12 fluorescent lamps were replaced with more efficient T-8 versions, and incandescent light bulbs were replaced with compact fluorescent lights. Occupancy sensors were also installed. Energy consumption for lighting has been reduced by 35 percent, with overall energy usage for the complex dropping by 10 percent. With the success of this project, the university plans to perform extensive lighting retrofits on campus.

Additional capital improvements being planned include new chiller and boiler equipment for the central utility and West Campus plants. These upgrades will further add to the university’s successful efforts to save energy.

For more information, contact Mike Myers, 512-280-7569, email mmyers@rebuild.com, or Bahman Yazdani at byazdani@esl.tamu.edu.

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Pease Makes His Move

Terry Pease, who has been winning friends, influencing people and making a difference through Wisconsin energy-efficiency programs, has shifted into a job focused on home weatherization in his state’s Department of Administration.

“We’re sorry to lose him, because people turned to him as a mentor and peer,” says Carla Clemons, the Rebuild America team leader for the Chicago Region of the U.S. Department of Energy. “He’s so collaborative and willing to share.”

She stresses the depth and value of Pease’s technical, political and program knowledge and understanding.

State of Wisconsin – Focus on Energy serves as the partnership for all Rebuild America projects in the state.

His new job has taken him out of Focus on Energy and into the weatherization program, still in the Division of Energy.

In the last week of August, Pease and a friend happened upon the scene of a highway accident and pulled a woman and her daughter from a burning car. It is characteristic of Pease that when he recounts the incident, he offers both practical advice – “always carry a fire extinguisher in your car” – and spirited encouragement to others to help whenever they can.

Rebuild America Progress Calculator

Number of Partnerships:
564

**Total Number of Committed or
Completed Square Feet:**
1,207,408,386

as of September 26, 2003

New Partnerships

- Branford Board of Education, CT
- Cahokia Community Energy Program, IL
- Columbus Zoo & Aquarium, OH
- Falls Church City Public Schools, VA
- Maine School Management Association, ME
- Maui Montessori, HI
- Petaluma City School District, CA
- Rebuild Molalla River School District, OR
- Seagull Schools Inc., HI
- Sherman County Wind, OR
- Shore Regional High School District, NJ
- Slide Ranch, CA
- State & Consumer Services Agency, CA
- Town of Trumbull, CT
- University of Ohio, OH

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. By investing in technology breakthroughs today, our nation can look forward to a more resilient economy and secure future.

Far-reaching technology changes will be essential to America's energy future. 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 portfolio of energy technologies that will:

- Conserve energy in the residential, commercial, industrial, government, and transportation sectors
- Increase and diversify energy supply, with a focus on renewable domestic sources
- Upgrade our national energy infrastructure
- Facilitate the emergence of hydrogen technologies as a vital new "energy carrier."

The Opportunities

Biomass Program

Using domestic, plant-derived resources to meet our fuel, power, and chemical needs

Building Technologies Program

Homes, schools, and businesses that use less energy, cost less to operate, and ultimately, generate as much power as they use

Distributed Energy & Electric Reliability Program

A more reliable energy infrastructure and reduced need for new power plants

Federal Energy Management Program

Leading by example, saving energy and taxpayer dollars in federal facilities

FreedomCAR & Vehicle Technologies Program

Less dependence on foreign oil, and eventual transition to an emissions-free, petroleum-free vehicle

Geothermal Technologies Program

Tapping the earth's energy to meet our heat and power needs

Hydrogen, Fuel Cells & Infrastructure Technologies Program

Paving the way toward a hydrogen economy and net-zero carbon energy future

Industrial Technologies Program

Boosting the productivity and competitiveness of U.S. industry through improvements in energy and environmental performance

Solar Energy Technology Program

Utilizing the sun's natural energy to generate electricity and provide water and space heating

Weatherization & Intergovernmental Program

Accelerating the use of today's best energy-efficient and renewable technologies in homes, communities, and businesses

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**Energy Efficiency
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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, Partner Update also incorporates news of other programs within the Office of Energy Efficiency and Renewable Energy.

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