Rebuild America

PARTNER UPDATE

Weatherization and Intergovernmental Program

DOE/EE-0278 • March – April 2003

Little Rock Leads in Rollout of Book for Physics Classes

The Rebuild Arkansas partnership recently hosted a two-day workshop to prepare high school science instructors to teach the newly published Active Physics *Light Up My Life* textbook. Little Rock is where the idea for the book originated, and Arkansas schools are the first to add the book to regular physics instruction.

The book is used in a short course focused on energy efficiency in lighting. It incorporates a hands-on, inquiry-based method of teaching science, while also providing students with a basis for good lighting design and energy-saving concepts that will help them, their parents and community in the long term.

The Rebuild Arkansas partnership – with the help of the Arkansas Energy Office, a number of school districts from around the state, and Rebuild America – organized a 23-person trip to Little Rock so that teachers could be trained to use the *Light Up My Life* kit. The kit includes student

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In This Issue

Hagerstown (MD) Housing Authority is using HOPE VI funds to replace distressed public housing units with an energy-efficient development.

Partnerships Use HOPE VI to Transform Affordable Housing

Rebuild America partnerships are transforming distressed public housing units into safe, healthy, energy-smart developments using HOPE VI funds from the U.S. Department of Housing and Urban Development (HUD).

HUD, a Rebuild America Strategic Partner, first offered the HOPE VI grants in 1993, under the name Urban Revitalization Demonstration. The program was created to help replace the estimated 86,000 units of public housing in dire condition, according to a report by the National Commission on Severely Distressed Public Housing.

Through the program, 114 cities have been awarded a total of $5 billion in HOPE VI grants. Rebuild America has worked with HUD on HOPE VI projects in Maryland, Massachusetts and Florida and has studied numerous other opportunities for teaming up. The recently released report *1999-2002 Public Housing Partnership: U.S. Department of Housing and Urban Development and U.S. Department of Energy* outlines the achievements realized through Rebuild America's partnership with HUD, including HOPE VI projects.

More than 57,000 units of distressed housing have been demolished under the HOPE VI program, with 23,000 more expected. HUD recently announced that 28 cities were awarded $484 million in HOPE VI grants for this year. Although the program was scheduled to end in 2002, it will not be eliminated until FY2004. The end of HOPE VI will not affect projects already in progress.

According to HUD, when HOPE VI first began, it was the only significant source of capital that gave cash-starved public housing authorities the base needed to leverage other public and private funds. Although more financial tools are available now, many housing authorities still look to HOPE VI to replace dilapidated structures that otherwise would remain in use. This

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Little Rock Leads in Rollout

textbooks, a teacher manual, spectrometers and light meters. Teachers made the trip from as far away as Northern Virginia and Kansas City.

Creation of the *Light Up My Life* book was spearheaded by the American Association of Physics Teachers and the National Science Foundation. Supported in part by Rebuild America, *Light Up My Life* went through an initial field test in spring 2001, followed in spring 2002 by pilot testing involving 321 students in five states. Final editorial revisions last summer prepared it to become the seventh book in the Active Physics series.

Sixteen Arkansas high schools currently offer Active Physics. Little Rock School District is the largest in the state and home to five high schools, including historic Central High School. All incoming ninth graders are required to take some form of physics, either general or advanced.

"Since we incorporated this unique method of learning and now require all our Little Rock high school students to take physics, we have seen rising test scores in math and science across the board," says Mayor Jim Daily. "I am excited that we now find ourselves playing a leading role in educational methods and in a national effort to educate our children about energy."

Light Up My Life publisher It's About Time says the Active Physics approach is being used in 667 schools around the country. About 390,000 students currently study with Active Physics, and more than 1.1 million students have participated in it since 1998.

According to Dennis Glasgow, director of the Mathematics and Science Department in the Little Rock Arkansas School District, only 20 percent of the student body was taking physics prior to the adoption of Active Physics, and most of those students were white males with strong science backgrounds. Today, 100 percent of the student body takes physics, allowing teachers to open doors of knowledge and career possibilities for all of them.

Teachers get together in Little Rock to learn to use the Light Up My Life *textbook.*

Teachers at a workshop in Little Rock take a look at life through spectroscopes.

"We are so excited to capture the imagination and enthusiasm of our high school kids, from urban and rural schools," says Chris Benson, director of the Arkansas State Energy Office. "This is not just a book but a mission to accomplish something big like saving energy, and kids are the best motivators as they tend to be early adopters."

Many of the teachers at the workshop shared stories about students who had said that being part of the *Light Up My Life* pilot program and Active Physics changed the way they looked at the world. Teachers said they didn't have to drag reluctant students into the subject, and that the students see the value and understand the content.

Rob Adams, a teacher from Delaware who was a presenter at the workshop, says his experience in the pilot testing was extremely positive.

"I thought it was a great unit," Adams says. "I found that at the end of this unit, my kids responded to it well, and my kids were saying how much it made them think about lighting."

Most often taught in the ninth grade, Active Physics stimulates interest in science as high school students see how principles of physics apply to the world around them. Because Active Physics is driven by activity and does not rely on heavy reading and advanced mathematics, it provides a learning experience for all students, including girls and minority students who typically may not enroll in physics classes.

The program provides take-home lessons that can involve and educate parents, too.

The U.S. Department of Energy, in partnership with Arkansas officials, plans to continue to support energy and science education regionally with the expectation that other school districts will soon follow this innovative approach. The *Light Up My Life* textbook has a host of other support, including Osram Sylvania, General Electric, the Illuminating Engineering Society of North America and many more businesses and associations.

Visit http://www.1800arkansas.com/Energy/Community_Education/Active_Physics.htm for more information about *Light Up My Life* and an Arkansas Energy Office contact.

Solutions at the Center of the Program Web Site

The Rebuild America Web site has been an evolving vehicle for disseminating program information. It has seen a 300 percent growth in visitors since October 2000. One enhancement that answers the need for a variety of often-requested information is the Solution Center.

With the launch of the Solution Center last year, there has been an increased awareness of the products and services offered by Rebuild America. The Solution Center contains information for the various market sectors and projects. It is logically organized to provide users the information they need to complete energy-saving and renewable-energy projects. It contains more than 140 resources and counting.

The Solution Center has a product ordering function for all products that are not downloaded directly. An enhanced version of the ordering function is due to be installed this year.

As always, for the Solution Center to be effective, it must be filled with useful information. If you have any resources you would like posted, send it to the program for review.

For more information, contact Scott Igoe, Rebuild America Webmaster, at rawebmaster@rebuild.org.

Multifamily Buildings Conference

The U.S. Department of Energy, the New York State Energy Research and Development Authority and the New York City Housing Authority will present an international conference on creating and maintaining quality, healthy and energy-efficient multifamily housing. The Multifamily Buildings 2003 Conference will take place at the New York Marriot Financial Center Hotel in New York City June 9-11. The theme of the conference is “Innovations and Solutions from Building Champions.”

Program topics include:

- New Construction/Major Rehabilitation/Development
- Operations & Maintenance
- Procurement & Energy Management Planning
- Energy Technology & Process Updates
- Existing Building Retrofits/Upgrades

Attendees include energy auditors, building owners and managers, architects, engineers, housing authority officials, utilities, energy service companies, manufacturers and financial institution representatives.

For more information, contact Rhona Saffer, Association for Energy Affordability Inc., at 212-279-3902 or email mfconference@aeanyc.org.

View From DC

by Daniel Sze

This is the time of year for looking around to see how far we have come and where we are headed. *Rebuild America 2002*, the program’s annual report, with data and an overview updated through the end of 2002, should be in your hands shortly after you read this. It is our State of the Program.

Much of the work must be documented in metrics – square feet renovated, energy saved, money saved, pollution avoided. There are stories to be told, too – brief success stories from around the country to illustrate the program’s work. And the fundamentals of the work must be explained, not only as a matter of record in a basic reference document but to spread an understanding of the program to anyone who may read the report.

Had it not been for Rebuild America, would so much work have been done? It’s extremely unlikely. Look at how many of the nation’s buildings still waste exorbitant amounts of energy. Those unimproved buildings are reminders that the program’s vision, expertise and champions are needed.

The importance of the metrics raises one of the trickier issues for Rebuild America – the need for better quantification of results. The metrics are complicated by project variables, by the need in many cases for lengthy analysis, by the basic problem of taking time from the busy schedules of operations managers or school administrators or others. But quantifiable results are essential. They allow us to say to the various levels of government and to the nation, "Here is the good being done."

The White House is devoted to pragmatism. "Results, not processes," is the catch phrase. Rebuild America needs to capture data from its 500-plus partnerships to demonstrate that it is, in fact, doing the public’s business in practical ways. It needs participants to gather and transmit the information in order to prove that tax dollars are being spent on worthy projects with substantial results.

Equally important, the metrics are a way of illuminating your successes. Those achievements become models for others to follow.

Because so many hard-working partnerships have reported their results, you will find in the annual report a respectable amount of statistical support for the program’s endeavors. There will be much more to come.

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

Small Businesses Profit from Savings in Kewanee

This is the way it should happen: Local champions push for energy-efficiency retrofits, state and federal help is provided as needed, dozens of local businesses agree to try retrofits, local suppliers of equipment and services get the renovation work, and the results are so clearly beneficial that more companies keep asking for similar projects.

And that is the way it did happen in Kewanee, IL. Sometimes things go just the way they should.

Since Rebuild Kewanee became a Rebuild America partnership in 1999, about 48 energy-efficiency projects have been funded among the town's businesses, and the number keeps growing. Almost all of the projects have involved small businesses, the target market sector for this partnership.

Overall savings are conservatively estimated at $100,000 a year, says Mark Mikenas of the Kewanee Chamber of Commerce.

Cost recovery was expected to be achieved in two to three years, and it has been about that long since the building retrofits began, which means the businesses that upgraded are entering the phase of pure savings.

More than 250,000 square feet of building space has been improved through the program. Companies benefiting from projects include retailers of shoes, gifts, sporting goods and other products, providers of insurance, car repair, day care and other services, and a variety of manufacturers.

The Kewanee Chamber of Commerce is the lead organization in the partnership. It got a strong boost from the local housing authority, which was renovating family housing and senior living facilities.

"Today we have businesses calling us on how to partner with us. We get calls all the time."

"Without their support and guidance, we would never have been able to bring this program to Kewanee," Mikenas says.

A U.S. Department of Energy grant of $75,000 was channeled to Rebuild Kewanee through the Illinois Department of Commerce and Community Affairs.

The partnership brought Pete Cali aboard as Rebuild Kewanee energy coordinator. The partnership began going to businesses and conducting walk-through audits with state energy officials.

Rebuild Kewanee hosted its first intern last summer. The intern had the opportunity to spend time gathering information at several area businesses. The collected data has been calculated into many of the projected savings.

Energy Coordinator Pete Cali

The partnership got the word out on energy efficiency through such methods as distributing kits containing tips on energy savings. At the Kewanee Chamber of Commerce-Rebuild Kewanee Spring Expo, 100 kits were given out and 500 people signed up to have kits mailed to them. Other kit mailings brought the total distributed to more than 1,000.

Business leaders were offered matching grants up to $1,000 per project, with the grant set at 50 percent of what a company was willing to spend. It was important that the partnership demonstrated its willingness to stand behind its recommendations with cash, Mikenas says.

Most of the retrofit work has been with low technology. Lighting retrofits have been a primary project, while some shops needed a vestibule at the entrance door or an installation of insulation. Some needed better furnaces or air conditioning.

One of the more creative retrofits was in a screen-printing company. Dryers operating at more than 400 degrees produced considerable heat that would rise and overheat the ceiling and second floor while leaving the ground-floor working area underheated in cold weather. A renovation now channels the hot air back down from the ceiling and distributes it at ground level, saving money on the company's heating bill.

Most of the work for the renovations went to local electricians and other local businesses, such as suppliers of furnaces and air conditioners.

"So it really had a good trickle down," says Mikenas. "Now they're selling it for us."

In a small town like Kewanee, with a population of only 13,000, word gets around. The effectiveness of the program also is selling it, especially because of the importance to small businesses of saving money on electric power bills.

"Today we have businesses calling us on how to partner with us," Mikenas says. "We get calls all the time."

Last year, Pete Cali told a Rebuild America peer forum in Indianapolis that the Rebuild Kewanee partnership had impacted at least 20 percent of downtown Kewanee businesses, and the program has continued to grow since then.

For more information, contact Greg Lenaghan, Rebuild America's Illinois representative in the state Department of Commerce and Community Affairs, at 217-785-3983, email glenagha@commerce.state.il.us.

Energy-Efficiency Projects Multiply in Nevada as Performance Contracting Takes Firm Root

Nevada is racking up the savings from several performance contracts, with more to come. The first one for the state government was a big one: 18 buildings in Carson City retrofit in a $1.9 million project, with annual savings guaranteed at more than $240,000 for most years of the 12-year contract.

"It was the very first performance contract done by the state, so that in itself was a milestone," says Dave McNeil of the Nevada State Office of Energy, a partner in Rebuild Nevada. "There was a fair amount of a learning curve that had to occur on performance contracts."

CMS Viron Energy Services, a Rebuild America Business Partner, served as general contractor for that first state contract. It was followed by the upgrade of several state office buildings in Las Vegas under a performance contract awarded to a Sierra Pacific Resources subsidiary named e•three. Other recent performance contracts won by e•three include one for Washoe County and four for the University of Nevada-Las Vegas.

"It was the very first performance contract done by the state, so that in itself was a milestone. There was a fair amount of a learning curve that had to occur on performance contracts."

Performance contracts are proliferating well beyond those connected to the Rebuild America program. The local government of Carson City, for example, has seen the work of one big performance contract completed by CMS Viron, with a follow-up contract entering final stages of agreement in March.

Larry Nair, energy retrofit coordinator for the Parks and Recreation Department of Carson City, explains that skyrocketing West Coast electricity prices during 2000-2001 set the stage for action.

"All of a sudden, this program was no longer mildly attractive. It was extremely attractive," he says.

Energy service company CMS Viron provided the salesmanship, Nair says, explaining, "The most active role was taken by the vendors themselves, in sort of courting the city, and showing the city how the financing could work."

Much work also has been done under such contracts with private-sector customers, such as hotels and casinos, says an e•three executive.

For the state, the first contract was for the State Capitol Complex – the Capitol Building, the State Library, the Nevada Supreme Court, the Nevada State Museum and several office buildings. The work included extensive lighting upgrades and installation of such equipment as new water boilers, window film, low-flow water devices and occupancy sensors to work with lighting controls.

The State Office of Energy and Rebuild Nevada took a supporting role, recommending approaches to contract language for the project and evaluating the proposals of energy service companies.

For the combined city-county government of Carson City, the first contract provided for the upgrade of five buildings at a cost of about $1.3 million, with a 10-year performance contract guaranteeing more than $144,000 in annual savings. The buildings included the courthouse and jail, the sheriff's offices, a community center, a pool complex and an administrative complex.

For a second contract, the city-county government intended to take care of about 18 more buildings – whatever needed improvement and wasn't covered by the first contract.

The energy-efficiency bug continues to spread. One of the most recent partnerships to join the Rebuild America network is the Carson City School District.

For more information, contact Dave McNeil, Nevada State Energy Office, 775-687-4909, dmcneil@dbi.state.nv.us, or Rebuild America Customer Service Representative Ken Baker, 208-861-5736, kbaker1@mindspring.com. Information also can be obtained from CMS Viron at www.viron.com and from e•three at www.energyefficiency.com.

The Nevada State Museum received an energy-efficiency retrofit.

TECHNOLOGY:

Specialists Learn Intricacies of Saving Energy on Heating, Ventilation and Cooling of Schools

For heating, ventilation and air conditioning (HVAC) in schools, there are many types of systems available, and that poses a potentially costly challenge: to choose wisely.

The National Renewable Energy Laboratory (NREL) and Lawrence Berkeley National Laboratory recently hosted a seminar in Washington, DC, to help specialists sort through the options. The featured speaker was Thomas H. Durkin, director of engineering and senior partner with Veazey Parrott Durkin & Shoulders, an architectural design and engineering firm based in Evansville, IN. The firm is a Rebuild America Business Partner.

Durkin's presentation not only contrasted available HVAC systems but allowed him to stress many of the pitfalls he sees in air-handling systems as currently designed.

The *Energy Design Guidelines for High Performance Schools*, developed by NREL and issued as seven climate-specific publications last year, can serve as a starting point for anyone considering the design or retrofit of schools in ways that would meet the goals of Rebuild America's EnergySmart Schools program.

Durkin offered a more individualized view of HVAC systems, drawing on the extensive experience of his firm in working with Indiana schools. He especially highlighted the need for humidity control, which may be a concern in almost all U.S. regions east of the Rocky Mountains.

"Control of humidity is one of those factors in design of schools that is very, very frequently ignored," Durkin said.

In analyses of the indoor air-quality problems of about 40 Indiana schools over the last five years, the No. 1 problem was lack of humidity control in summer, he said.

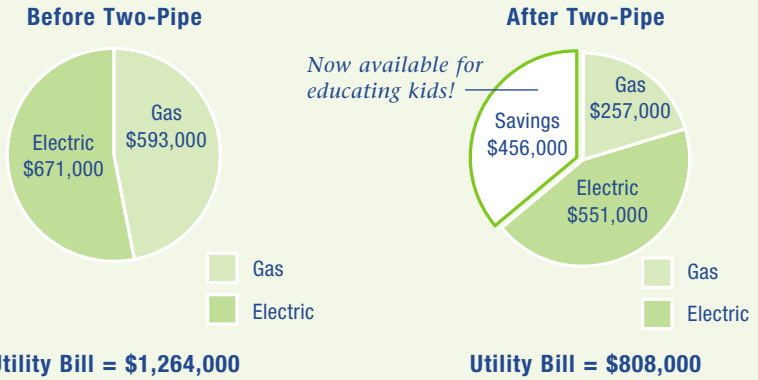
Durkin said the two primary causes of high humidity are valve control of constant-volume air handlers, and use of direct-expansion (DX) equipment with continuous ventilation and intermittent compressor operation. "Unfortunately, many schools are still being designed with these elements," he noted.

Other causes of high humidity that he listed were: 24-hour operations, a building under negative pressure (less pressure than the outside air, causing air to "leak" in), oversized equipment, structural problems such as a leaky roof, and housekeeping problems such as dampness from carpet cleaning. To dry carpets after shampooing without encouraging growth of mold and mildew, use room dehumidifiers, not carpet fans or the HVAC system, he said.

To deal with the full range of problems, not just humidity, Durkin went through a list of recommended elements:

1. Individual space control. Otherwise, occupants may resort to such things as bringing in their own heaters.
2. Where hydronic heating is used, hot water is preferable to steam, and hot-water boilers should be condensing modular boilers. Water temperature should be set at 135 degrees, not the 180 or 200 that is typical. The lower setting will allow the condensing boiler to work more efficiently, and that type of boiler does not need the higher temperature to prevent corrosion. Maintenance also will be less with condensing than conventional boilers.
3. With hydronic cooling, chiller size should take into account load diversity, especially if a building includes large assembly spaces such as gyms and cafeterias. Use air-cooled chillers for up to 200 tons. Water-cooled chillers are best above 400 tons. Include chemical and biological water treatment in cooling towers.
4. Variable-speed drives should be considered for any motor larger than 10 horsepower.
5. Variable-speed primary pumping schemes should be considered for boiler and chiller circuits to minimize

20 Buildings in Evansville, Indiana



In one school district, following the advice of Tom Durkin, two-pipe systems were added to 20 schools and cut space-conditioning costs dramatically as part of extensive energy-efficiency retrofits in the 1990s.

Veazey Parrott Durkin & Shoulders

School Mechanical System Options

	Construction Cost (per sq. ft.)	Life (yrs.)	Utility Cost (per sq. ft.)	Maintenance Burden	Humidity Control
Rooftop Single Zone	$8	12-15	$1.05	Avg./High	Poor
Rooftop with Heat Wheel	$12	12-15	$0.90	High	Good
Air Source Heat Pumps	$15	12-15	$0.70	High	Poor
Split System UV with DX	$17	15	$0.95	High	Poor
Geothermal Heat Pumps	$18	12-15	$0.65	High	Poor
4-Pipe UV with Valve Control	$18	25	$0.90	Avg.	Poor
Variable Air Volume	$20	20	$1.00	Avg./High	Very Good
Anything with Separate MUA	$25	15	$1.25	Very High	Excellent
2-Pipe UV with F&BP	$13-14	25	$0.60	Low	Good

UV: unit ventilators. DX: direct expansion (cooling system). MUA: make-up air.
F&BP: face and bypass control (modulating amounts of air flowing through or around heat exchangers).

Veazey Parrott Durkin & Shoulders

the number and horsepower of hydronic pumps.

6. Simultaneous operation of boilers and chillers should be avoided.
7. Outside air is free. Air-handling equipment should be able to use up to 100 percent fresh air for cooling.
8. Rejected heat from a chiller is free, so systems should use heat-recovery chillers for heating water or other heating purposes concurrent with cooling. "This is going to save you energy in almost every application," Durkin said. "It is almost never done. It was considered decades ago. This is an effort to resurrect it."
9. Indoor swimming pools should include dehumidification systems and energy and water recovery schemes.
10. Energy management systems should be installed, with the capability of room or zone monitoring and scheduling. Pneumatics can be used for actuation but should not be used for control.
11. Controls should have defined sequences for both "occupied" and "unoccupied" areas and time periods. Too much focus on occupied places can overlook energy waste from unoccupied places.
12. Management systems for outside air are advisable. Outside air is the source of much excess heat or cold air and almost all humidity. Outside air management should allow for "smart scheduling" reflecting levels of occupancy. Carbon dioxide sensors can be used.
13. Maintainability should be discussed with the owner.
14. Coordination among architects and engineers should take into account daylighting.
15. There should be a degree of equipment redundancy, so that no failure of a single piece of equipment can prevent the school from operating.
16. If coiled circulating pumps are used, they should be installed in the by-pass position and be sized for no more than one-third of rated flow.
17. If an emergency generator is provided, it should be large enough to carry minimal heating pumps and a boiler, to prevent freeze-ups.
18. A final point in the wake of the Sept. 11, 2001, attacks: A "safe area" should be provided, in a large assembly space, with an air handler capable of 100 percent recirculation (not outside air) and high-efficiency air filters.

Durkin also is noted for his advocacy of two-pipe HVAC systems. Those systems lost popularity decades ago, but he has been leading a renaissance of the systems. Done correctly, circulation of heated and chilled water throughout a building using two pipes saves on equipment and energy costs and increases occupant comfort in comparison to the more common four-pipe systems.

Suppliers of HVAC systems among Rebuild America Business Partners include Applied Energy Recovery, McQuay International and Trane. Business Partners supplying controls for HVAC systems include Honeywell, Johnson Controls, Novitas and Siemens.

For more information on school HVAC systems, check the Energy Design Guidelines for High Performance Schools, available in PDF format through the Rebuild America Solution Center (at www.rebuild.gov) or in printed form or on CD-Rom through the Rebuild America Clearinghouse at 252-459-4664. To contact Tom Durkin, call Veazey Parrott Durkin & Shoulders at 317-574-5970 or visit the company Web site at www.vpdsweb.com.

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Partnerships Use HOPE VI

opportunity allows public housing authorities to reevaluate the design of public housing, including how energy is used in their properties.

In Maryland, the Hagerstown Housing Authority (HHA) – a Rebuild America community partnership and HUD-recognized High Performer – was awarded a $27 million HOPE VI grant in 2001 to replace the aging Westview apartments. The property, built in 1952 to house many of the railroad workers in the neighborhood, reflects the typical public housing development of the era. Six to eight units were housed together in barrack-style structures, disconnected from the surrounding neighborhood. The structures used central heating for each building, and there was no individual metering.

Using the HUD grant as leverage, HHA was able to secure state and city funds to replace Westview with a mixed-use complex. Although the HOPE VI grant only covers one-third of the cost, it was the catalyst to get the project started.

The new development, to be called Gateway Crossing, will reconnect the units to the existing neighborhood's street plan. A majority of the units will be duplex homes.

Gateway Crossing will be a model of energy-efficiency for public housing. High-rated ceiling and wall insulation, high-performance windows and energy-efficient heating, ventilation and air conditioning will be installed. Plans also call for energy-saving interior and exterior lighting and ENERGY STAR® appliances.

Construction crews are wrapping up demolition of Westview this spring. Groundbreaking on the first phase of Gateway Crossing is expected to follow shortly thereafter.

In addition to HHA, other Rebuild America partners have seized the opportunity to use HOPE VI funds to replace aging developments. Boston Housing Authority (BHA), a partner of Rebuild Boston, is redeveloping the 60-year-old Maverick Gardens housing complex in East Boston using Hope VI funds.

Over 280 new rental units will be built at the current Maverick Gardens site, near the Maverick transit stop, with 110 more to be built at another location. With involvement from the housing residents, BHA held a design charette for the multi-use, mixed-income project being funded in part by the $35 million Hope VI grant. Other funding is being provided by the city of Boston, state and private sources.

The new Maverick Gardens emphasizes green space and sustainability in construction. The design incorporates energy-efficient building materials, lighting and appliances. Photovoltaic panels and a solar hot water heating system will be installed at Maverick Gardens, made possible by a grant from the Massachusetts Technology Collaborative.

BHA is working to adapt the project to LEED Green Building Rating System™ standards, with Rebuild America providing technical and process assistance. Construction on the new development will begin in spring 2003.

Rebuild America also teamed up with HUD and the U.S. Environmental Protection Agency to assist Miami-Dade County, FL, with a HOPE VI project. The Miami-Dade Housing Agency was awarded funds to replace two public housing complexes plagued by aging infrastructure and crime problems. Rebuild America co-sponsored a design charette and provided expert design review to ensure that the new project will be energy-efficient.

HUD reports that 20,000 new units of safe, attractive and vibrant developments have been built so far thanks to HOPE VI grants. With several billion dollars in awarded funds not yet spent, HOPE VI will continue to make an impact on public housing for many years to come.

For more information, contact Matt Pesce, at 803-980-8467 or email mpesce@aspensys.com. For a copy of *1999-2002 Public Housing Partnership: U.S. Department of Housing and Urban Development and U.S. Department of Energy*, visit http://www.rebuild.org/attachments/SolutionCenter/HUDRBA_Report2003(1).pdf.

Efficiency at HUD

The U.S. Department of Housing and Urban Development (HUD) is involved in a variety of efforts to make existing public housing more energy efficient.

In 1999, HUD entered into an Interagency Agreement (IAA) with the U.S. Department of Energy and Rebuild America. The IAA, which expired in December, promoted energy efficiency in public housing through research, training workshops, forums and demonstration projects.

More than 30 new Rebuild America partnerships were formed through the IAA to improve public housing. Additional partnerships were formed with groups that are involved with public housing, and six existing Rebuild America partnerships started new energy projects because of the IAA.

Rebuild America provided various types of technical assistance to these projects. Through the IAA, Rebuild America provided energy training on various topics at nearly two dozen conferences and workshops, and reviewed HUD's Energy Efficiency Action Plan.

DOE and HUD continue to work together under a Memorandum of Understanding (MOU) signed with the U.S. Environmental Protection Agency. Through the MOU, the agencies will work together to expand the use of ENERGY STAR® products throughout HUD's affordable housing programs.

Students listen to President Bush speak at the National Building Museum.

EnergySmart Students Hear Case for Hydrogen

Science and energy students from Rebuild America partnership programs were chosen to hear President George W. Bush make the case for hydrogen as the revolutionary fuel of the future.

The 92 students and 12 chaperones gathered February 6 at the National Building Museum in Washington, DC, to hear the president's remarks. While there, they took part in hands-on science activities provided by a Rebuild America Strategic Partner, the NEED (National Energy Education Development) Project.

The students were from Thomas Jefferson Middle School (Arlington County, VA), Barnard Elementary School (District of Columbia) and Alexandria Country Day School (Alexandria, VA), all participants in Rebuild America partnerships.

In each of the schools, NEED's energy education materials are used in conjunction with Rebuild America EnergySmart Schools technical support as the schools try to reduce energy use, deploy energy-efficient technologies and, in the case of Barnard Elementary, build entirely new schools. The schools also utilize NEED materials to meet the requirements of the Virginia Standards of Learning for Science and the District of Columbia Standards for Science.

President Bush directly addressed the students as he promoted his vision: "I also want to thank the students who are here, the science and technology students who are here – our future scientists, those who are going to take what appears to be dramatic innovation today and improve on it in the coming years."

"And so thanks for your interest and thanks for caring about your country. Keep studying hard," he said. And then, to laughter, he added, "Don't watch too much TV. Read a lot."

For more information on the nonprofit education association NEED, visit www.need.org.

U.S. Places Big Bets on Hydrogen Fuel Cells

If the hopes being placed on hydrogen come true, building retrofits someday will include installation of one or more hydrogen fuel cells. Those low-pollution power generators will allow a building's occupants to achieve at least a degree of independence from the regional energy grid.

An office building might run entirely on its own fuel cells during normal operations. If internal demand exceeds that supply, the building could draw on the conventional supply of the regional power grid. During times of low internal demand, the building might feed surplus electricity into the grid, with compensation required from the utility.

The risk of a regional blackout might be eliminated for a building operating its own fuel cells. Regional spikes in electricity prices also can be mitigated with such "distributed generation."

Those are the dreams. The Bush administration now is trying to hasten the day when they become reality. It has proposed a new, $1.2 billion program to research hydrogen fuel and vehicles running on hydrogen. Added to other existing programs, the total would be $1.7 billion over five years for hydrogen, fuel cells and hydrogen-powered cars.

David Garman, assistant secretary for Energy Efficiency and Renewable Energy (EERE), stressed the potential of distributed generation March 11 when he appeared before the Senate Energy and Natural Resources Committee.

"These distributed energy technologies include fuel cells, microturbines, and biomass systems, to name a few," Garman testified. "Using distributed generation, we increase the available supply, improve reliability, and reduce demand on our constrained power system."

It is more than talk. On March 14, the Los Angeles Department of Water and Power unveiled a new fuel-cell power plant in the department's headquarters. Manufactured by FuelCell Energy Inc., the plant has a capacity of 250 kilowatts (kW), its hydrogen fuel derived from the building's natural gas supply. Much of its output will be sent into the city power grid.

In February, the Long Island Power Authority said it would install 45 of manufacturer Plug Power's 5 kW fuel cells at various sites. Last year, manufacturer UTC Fuel Cells, a unit of United Technologies Corp., provided 200 kW fuel cells to sites in New York, New Jersey and Texas.

Typically there is a government component in such actions. In New Jersey, a subsidy from the Board of Public Utilities promotes cleaner alternative fuels. In New York,

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Hydrogen Fuel Cells

there is state pressure on utilities to increase their use of alternative energy.

There has been much research done on both stationary and mobile applications for fuel cells. Stationary fuel cells may be closer to commercialization for several reasons:

- Weight and size are less of a problem for fuel cells going into buildings
- Repair is less of a problem for stationary fuel cells than for vehicles that may break down far from the nearest fuel-cell specialist
- Hospitals, police stations, jails and many corporations already have a strong incentive to install backup generators to protect against power failures
- Surplus electricity from a building's fuel cells can be sold into the power grid

The essence of a fuel cell is a device that strips electrons away from hydrogen atoms. While the electrons are moving separately from the protons of the hydrogen, they provide the fuel cell's electrical power. The electrons and protons then rejoin and combine with oxygen to form water vapor. The hydrogen is most often obtained by breaking it loose from the carbon in natural gas, while the oxygen comes from the air.

An infrastructure for hydrogen fuel is needed for both production and distribution. And because much hydrogen may come from gas and coal, carbon disposal strategies may be needed to avoid pouring carbon compounds into the air as byproducts.

U.S. Secretary of Energy Spencer Abraham announced on February 27 that the United States would take the lead in a $1 billion public-private effort to construct a fossil-fuel power plant that would be virtually free of pollution. He said the project, named FutureGen, will produce both hydrogen and electricity, and that its carbon would be sequestered.

Carbon sequestration may involve capture of carbon dioxide (CO_2) for pumping down into geologic formations. Another method of sequestration would channel CO_2 gases over limewater, causing a chemical reaction that binds the carbon into limestone.

Visit www.eere.energy.gov/hydrogenandfuelcells/ for information on the federal Hydrogen, Fuel Cells & Infrastructure Technologies Program. Call FuelCell Energy at 860-350-9100, Plug Power at 518-782-7700 or UTC Fuel Cells at 860-727-2200 for details on their fuel cells.

Upcoming Events

May

1-3 Building the Town Green Conference and Expo, Houston Hall, University of Pennsylvania, Philadelphia, PA. Contact Linda Knapp at 215-546-0724 or email lknapp@netreach.net.

14-16 The National Association of Energy Service Companies Mid-Year Conference, Loews Coronado Bay Resort, San Diego, CA. Call 202-822-0954, visit www.naesco.org or email mlb@dwgp.com.

18-21 9th National Clean Cities Conference and Exposition, Palm Springs Convention Center, Palm Springs, CA. Visit http://www.ccities.doe.gov/conference.shtml.

20 Environmental Leadership Workshop, Mammoth Cave National Park, Mammoth Cave, KY. Contact Mary Conner at 270-758-2254 or email mary_conner@nps.gov.

June

9-11 NYSERDA Multifamily Buildings 2003 Conference, New York Marriott Financial Center Hotel, New York, NY. Contact Rhona Saffer at 212-279-3902 or email mfconference@aeanyc.org.

23-26 National Workshop on State Building Energy Codes, Sheraton Atlanta Hotel, Atlanta, GA. Presented by the U.S. DOE's Office of Energy Efficiency and Renewable Energy. Visit http://www.energycodes.gov/news/2003_workshop/index.stm.

Rebuild America Progress Calculator

Number of Partnerships:

513

Total Number of Committed or Completed Square Feet:

1,098,947,330

as of March 27, 2003

Snap Shot: Larry Schoff

Larry Schoff is the National EnergySmart Schools Sector Technical Analyst with Rebuild America's EnergySmart Schools.

Vital Statistics

Larry Schoff has lived in Blacksburg, VA, for 19 years with his wife, Allyne, a special needs teacher. He has a graduate degree in civil engineering and, like his daughter, is a licensed Professional Engineer. Larry retired from the U.S. Air Force in 1984. He has been working in facilities maintenance and operations for more than 38 years. The Rams are his favorite football team (since 1950).

How long have you been working with the Rebuild America program?

I began with Rebuild America in August 1998 after working with Montgomery County (VA) Public Schools and the National Clearinghouse for Educational Facilities. I began as the K-12 School Sector Manager and, for the past three years, have served as the EnergySmart Schools National Technical Analyst for Rebuild America. During this time I have served on behalf of the United States on the International Energy Agency Annex 36 Working Group dealing with energy retrofits of educational facilities and the development of an Energy Concept Advisor for decision-makers (to be released this fall).

How did you get into this line of work?

A 20-year career in the U.S. Air Force as a Base Engineering Officer and having the responsibility at all levels for energy conservation programs, in addition to the operations, maintenance and construction of base facilities. After retirement, I served as the Director of Facilities Maintenance and Transportation for Montgomery County Public Schools for more than 13 years. I was responsible for maintenance and operations of over 1.4 million square feet of facilities and the construction of over 200,000 square feet of new schools with operating budgets of more than $7 million annually. I was also responsible for transporting over 7,000 students to and from school daily.

What do you find most rewarding about your work?

Seeing schools and school districts increasing their awareness and efforts to improve energy efficiency and to upgrade the learning and teaching environment for students and staff. Reading and hearing that school decision-makers are now asking designers and engineers for inclusion of high performance design elements in their construction and renovation school projects. Receiving notification from school personnel that recommendations concerning operations of the utility systems are being implemented and energy and dollars are being saved to be used for education.

What is your favorite thing to do in Virginia?

Travel to the many historical places and learn more about our past. Also, attend Virginia Tech football and basketball games.

What do you like to do in your spare time?

Rest!

What is your dream vacation?

A fully equipped cottage, with satellite TV, hot tub, etc., on the water (lake, river or ocean) in a cool area of the country, with snow-capped mountains visible from several views, and many trails to walk and relax.

NEW PARTNERSHIPS

Glenbard Township High School District 87, IL
Duvall County Public Schools, FL
Tucson Unified School District, AZ
Johnson County, KS
Heritage Harbor Museum, RI
Rock Valley College, IL
Rebuild Quincy, IL
Labor of Love Ministries, Inc., GA
Village of Oak Park Community Energy Program, IL

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

Wind & Hydropower Technologies Program
Harnessing America's abundant natural resources for clean power generation

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

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

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

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