REBUILD AMERICA

Partner Update

U.S. Department of Energy • Office of Energy Efficiency and Renewable Energy www.rebuild.org • DOE/EE-0242

January–February 2001

Partner Update Gets New Look

This issue heralds both a new scope for Rebuild America and a new look for Partner Update. The redesigned newsletter will accommodate news of Rebuild America's sister programs, beginning with Building America and High Performance Buildings. An introductory story about Building America can be found on p. 2 and additional coverage can be found on p. 7. An article about High Performance Buildings also appears on p. 7. Stories found in the center section of the newsletter are organized into the following categories: Building Retrofits, New Construction, and Technology/Best Practices. We have also added a new feature, Partner-at-a-Glance, to highlight the activities of the lead partner of a Rebuild America partnership. Our featured partner in this issue is the College of Engineering, Southern Illinois University (see p. 5). As always, we welcome your story ideas, news, photos and comments. (See photographic requirements on back page.) Contact **Elise G. Rand**, Potomac Communications Group, at 202-466-7391 or erand@pcgpr.com with your information.

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Mark Ginsberg

Dear Partners in Energy Efficiency,

Energy-efficiency programs and initiatives in the U.S. Department of Energy's Office of Building Technology, State and Community Programs (BTS) have always worked toward a shared goal of a more energy-efficient and prosperous America. The new year ushers in a new era for Rebuild America and its BTS affiliates.

While pursuing their respective goals, Building America, High Performance Buildings, ENERGY STAR® and the Million Solar Roofs Initiative have collectively covered building energy retrofits, new residential construction, green building, schools, renewable energy technologies, outdoor lighting and alternatively fueled vehicles, among other areas. We at BTS have amassed considerable information about how to implement energy-saving measures and improve quality of life in communities across the country. Now is the time to combine these capabilities and practices and advance to the next level. Ultimately, the goal is to weave energy-saving practices into the fabric of American society. The country would greatly benefit if energy-efficient practices became "business as usual" for Americans both at home and at work.

Toward this end, Rebuild America, Building America and High Performance Buildings are taking the first steps by joining together to broaden the reach of their energy-saving efforts. Partner Update is one of the first endeavors, incorporating a new look and expanding its scope to include coverage of Building America and High Performance Buildings activities. In the coming months, the newsletter coverage will continue to expand into other areas of BTS.

This integration of information and practices presents new opportunities for the constituencies that these BTS partners represent. Rebuild America partnerships looking to expand their efforts may elect to explore the residential sector, or perhaps new commercial construction. Through Building America and High Performance Buildings, Rebuild America partnerships will learn how to put into practice the efficiencies that home builders and commercial developers are discovering. Building America and High Performance Building participants, on the other hand, will be introduced to the activities of each another and those of Rebuild America and may find common ground and opportunities for collaboration.

By linking all these partners, we will broaden the range of information and resources available to you. I am confident that the cross-fertilization of ideas among participants will create positive results. The coming year promises to be a very productive one and I look forward to working with all of you to continue to develop energy solutions to incorporate more fully into the everyday lives of Americans.

Sincerely,

Mark Ginsberg
Deputy Assistant Secretary
U.S. Department of Energy

Building America: Improving New Home Performance

Building America, a partnership between the U.S. Department of Energy (DOE) and the housing industry, is dedicated to improving the performance of new homes through increased efficiencies in design and construction.

"Building America is dedicated to demonstrating that new homes can be both cost-effective to build and energy-efficient to live in," according to George James, Building America program manager.

In fact, the energy consumption of new homes can be effectively reduced by 30 to 50 percent with little or no impact on the construction costs.

The basic premise of Building America revolves around the house as an integrated system of components. It aims to achieve an ideal combination of efficient and cost-effective design and engineering in home building by involving the entire development team from the start, including the architect, builder, building materials suppliers, developer, utilities and financial backers.

Building America demonstrates how builders can use a systems engineering approach to increase quality and performance without significantly increasing price. By refining building envelope and mechanical system components, builders can save money while producing more comfortable houses.

Building America has five consortia, comprised of more than 150 different companies. These teams, which include both Fortune 500 companies and small businesses, are producing energy-efficient, environmentally sensitive, affordable and adaptable homes on a community scale.

The five Building America consortia are:

- Building Science Consortium, Westford, MA
- Consortium for Advanced Residential Buildings, Norwalk, CT
- Hickory Consortium, West Wareham, MA
- IBACOS Consortium, Pittsburgh, PA
- Industrialized Housing Partnership, Orlando, FL.

As of October 2000, these consortia had nearly 3,000 houses under construction in 17 states. DOE cost shares research and development support with the consortia, while the industry teams pay for construction costs. Building America has built these highly efficient residences in a number of communities.

Building America estimates that "word of mouth" promotion to builders and developers will allow for widespread information dissemination, yielding 15,000 houses incorporating system integration methods. Meanwhile, Building America is pressing steadily toward its goals:

- Developing cost-effective systems solutions for housing production that reduce energy use by an average of 50 percent while increasing comfort, quality and durability.
- Facilitating adoption of the systems engineering approach in 30 percent of the new housing market.

By offering improved comfort and lower utility bills, builders applying Building America practices have a distinct advantage over those offering less efficient housing. Reduced energy consumption, increased affordability and greater comfort increase the appeal of these homes for prospective buyers.

For more information contact George James at george.james@ee.doe.gov or Ren Anderson at ren.anderson@ee.doe.gov.

This home in the IBACOS Washington's Landing development is a model of efficient design.

"Building America is dedicated to demonstrating that new homes can be both cost-effective to build and energy-efficient to live in."

George James
Building America
Program Manager

Presenters' Network Up and Running…

Need an energy-efficiency expert for an upcoming event? Rebuild America can help with its Network of Expert Presenters, a newly launched web-based service that enables you to browse speaker availability by topic and region and reserve the presenter(s) best suited for your event. The Network also provides photos and bios on the presenters. The Network of Expert Presenters is comprised of members of the Rebuild America program team, including many from Department of Energy laboratories and representatives from Rebuild America's Business Partners. To find out more, acces the network by visiting the www.rebuild.org home page or contact Doug Avery at davery@lbl.gov.

Gearing up for ATLANTA

National Forum 2001
rebuild america

Details for the National Forum 2001 are coming together, and the event is shaping up to be a real crowd pleaser. Activities begin on March 13 at 2 p.m. and continue through March 15. Here's a sampling of what's in store:

Tuesday, March 13: Unanswered Rebuild America questions? Find out all the answers at the Rebuild 101 pre-conference tutorial, which will present a program overview and will provide experts to answer your specific questions. Other tutorials, including *The State of the States*, will also be featured. After the main event at 4 p.m., be prepared to meet and greet at the evening event.

The National Forum's collaboration with the Southface Energy Institute's Greenprints conference adds an exciting dimension to this year's event.

Wednesday, March 14: Kennedy Smith, director of the National Main Street Program, will serve as our keynote speaker. Local Main Street programs serve communities by evaluating commercial districts' opportunities and long-term needs, which is in line with the Rebuild America mission. For more information about the Main Street program, visit www.mainstreet.org.

Throughout the day, educational sessions will be held in five tracks or keys – *High-Performance Partnerships, Connecting with Classrooms and Campuses, The Changing Energy Landscape, Tomorrow's Technologies Today,* and *Innovative Approaches to Reaching Key Audiences.* Sessions include: Seven Habits of Highly Effective Partnerships, Reaching School Decision Makers, Leveraging Public Benefits Funds, HVAC and Benchmarking, and The Keys to Energy Efficiency in Housing: Public, Affordable, New Residential. During a luncheon ceremony, Department of Energy's Mark Ginsberg will present the Energy Champion Awards.

Thursday, March 15: This shared day of activities with Greenprints 2001 will open with a plenary and keynote speaker that appeals to both audiences. Opening events will be followed by breakout sessions in five environmental/design keys – *Sustainable Community Design, Construction Ecology, Clean Energy and Transportation Technology, High Performance Buildings Process & Programs,* and *Getting to a Green and Efficient Future.*

For more session and speaker updates, online registration and information about the National Forum 2001, visit www.rebuildforum.org. For registration information, contact Christina Van Vleck at 301-588-4229.

View From DC

By Mark Bailey & Daniel Sze

The new year brings new meaning to the word "partnering" for Rebuild America partnerships. Our new collaborations with Building America and the High Performance Buildings initiative open the door to fresh possibilities and opportunities for shaping sustainable communities. A look at how Building America and Rebuild America are working toward a common goal of community sustainability by revitalizing urban areas of Pittsburgh underscores the potential of such collaborations.

For example, Building America's IBACOS (Integrated Building and Construction Solutions) team is working with developers of the Summerset community at Frick Park in Pittsburgh to transform an abandoned slag heap – a byproduct of the City's steel industry – into a new community of cutting edge, efficient homes.

Building America's IBACOS team at the Summerset site.

Summerset is a redeveloped Brownfield that is using land recycling, smart growth planning and urban infill to create a new urban community of traditionally styled single family homes, townhomes and apartments that offer the latest in technology. The new homes will feature the latest advances in building materials and technology and embody a commitment to quality, energy efficiency, low monthly operating costs and value.

The project goes beyond the residential development to address the needs of the larger community. In redeveloping the site, almost 140 acres will be dedicated to the expansion of Pittsburgh's historic Frick Park and the creation of new neighborhood parks. A stream, watershed and the surrounding hillsides will be restored and a trail system developed to provide riverfront access. Rebuild America Program Representative Mike Myers visited the site in 1999 and met with Michael Dickens, president of IBACOS, to learn firsthand about the project.

Elsewhere in the City, exciting developments are underway on the Rebuild America front where Rebuild Pittsburgh is striving to educate the *Continued on page 4*

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View From DC

development community about green building. Led by the nonprofit Green Building Alliance, Rebuild Pittsburgh has set its sights on two revitalization projects: the Pittsburgh Convention Center and Middle Hill, an inner city neighborhood. Rebuild Pittsburgh's involvement has led the convention center to incorporate energy-efficiency features into the building design and make optimal use of natural light and ventilation to provide a better quality indoor environment. The partnership is also assisting Middle Hill in applying principles of green development to all new construction and renovation projects that are part of its revitalization efforts.

Working independently, both Building America and Rebuild America have benefited Pittsburgh communities on multiple levels. An alliance between the two programs will serve to further strengthen the benefits and services both can provide to a community.

While Rebuild America partnerships have begun to branch into renewable technologies and green building, most partnership activity has focused on improving existing buildings. The emphasis for Building America has been on increasing efficiencies in new residential construction and on enhancing performance through the research, testing and adoption of new practices. For High Performance Buildings, the focus is on highly efficient, new commercial construction. Rebuild America works with community-based partnerships, Building America teams with major residential builders and High Performance Buildings works with commercial developers, architects and engineers.

No doubt the future will bring frequent and participatory collaborations between Rebuild America, Building America, High Performance Buildings and other energy-saving initiatives. Stay tuned for developments.

Snap Shot

Richard Putnam

Vital Statistics:
Lives on Bainbridge Island in Washington with his wife, Marilyn, who is a pre-school director. Has four grown children and two grandchildren.

Current Role with Rebuild:
Rebuild America Regional Team Leader for the Seattle Region.

Most rewarding aspect of your work:
Making the most of local resources and skills by and adding peer-to-peer assistance to create sustainable local projects.

How did you become involved with Rebuild:
Due to a promotion, there was an opening in the Seattle Regional Office. My past experience as program manager for the Weatherization, HERS and Building America programs all provided me with the knowledge to participate in Rebuild America.

What do you do in your spare time:
Biking, hiking, reading, and keeping in touch with family.

What is your dream job:
To be the director of a foundation with unlimited grant money to provide technical assistance to affordable and sustainable projects.

What would you like to try that you haven't:
Long distance biking.

SMHA Wins Governor's Award

The Stark Metropolitan Housing Authority (SMHA), a partner of Rebuild Ohio, was honored on January 3 with a Governor's Award for Excellence in Energy Efficiency. SMHA's winning project was the Energy Conservation Appliance Replacement Program. The project involved the purchase of over 1,700 Magic Chef Maytag refrigerators that cut energy consumption in half compared to the refrigerators they replaced.

The new refrigerators are reducing SMHA energy bills by over $90,000 annually and have a life expectancy of 19 years. They can also be credited with helping the environment by reducing harmful emissions. Each year about 2.3 million pounds of carbon dioxide, 8,508 pounds of nitrogen oxide and 22,807 pounds of sulfur dioxide will be avoided due to the refrigerator replacements, according to SMHA Executive Director Cherrie Turner.

Ohio Lt. Gov. Maureen O'Connor congratulates SMHA. From left: SMHA Energy and Compliance Supervisor Steve Ewing; two Maytag representatives; SMHA Maintenance and Development Director Mike Williams; United National Bank's Monica Graves; Lt. Gov. O'Connor; SMHA General Accountant Marvin Fox; SMHA Finance Director Diana Kolm; SMHA Energy Assistant Salene Cater; and SMHA Executive Director Cherrie Turner.

SIUC Commits to Energy Efficiency

Lead Partner/Name of Partnership: *College of Engineering, Southern Illinois University Carbondale*

Executive Officer: *Dean George Swisher, PhD, PE*

Main Contact: *Associate Professor Manohar Kulkarni, PhD, PE*

Student Enrollment: *22,552 (Fall 2000)*

Carbondale City Manager Jeff Doherty, left, and Engineering Dean George Swisher

What led the University to pursue a path of energy efficiency?

Ours is a comprehensive university with the top Carnegie Research status. We have a very active Coal Research Center dedicated to clean coal technologies, various integrated energy and environment initiatives within the colleges of Engineering & Agribusiness Economics and a commitment by the administration to making our campus facilities energy efficient and up-to-date. We also have the only Mining Engineering program in the state that addresses energy efficiency issues in mining operations. We are fortunate to live in a community that is very active at the forefronts of renewable energy, sustainability and the environment.

How did College of Engineering become involved in Rebuild America?

The College of Engineering at SIUC has been very active in energy conversion and utilization. Current energy conversion initiatives include fuel cells, biomass derived energy and establishing a high-efficiency, environmentally clean energy technologies center. With grants from the state, we have or are pursuing initiatives such as Creating Energy Management Opportunities for Industry and Developing Energy Resources for Business and Industry. We also helped organize the first Southern Illinois Energy Expo, held on campus in 1999. The engineering curricula includes course offerings such as Energy Management and Energy & Society. In view of all this, it is quite natural for SIUC's College of Engineering to become involved in Rebuild America.

What is the partnership's goal?

To make the concept of energy efficiency as commonplace and as widely understood as recycling is today.

What is the partnership's current focus?

Our current focus is on the energy retrofitting and energy-efficiency research of buildings belonging to the campus and selected Rebuild America partners that represent 300,000 square feet. This involves:

- Performing five energy assessments per year
- Researching improvements to electric motor efficiency
- Conducting energy-related workshops and seminars
- Developing a directory of regional energy service providers
- Partnering with high schools to encourage student-conducted home energy assessments
- Partnering with community businesses and lenders to promote energy-efficient mortgages
- Implementing a leveraged CFL/LED lamp initiative and promoting programmable thermostatic controls and occupancy sensors.

In addition, we are promoting renewable energy through passive solar homes, solar panels for a hog farmer, and photovoltaics for outdoor lighting.

How do your partnership activities benefit the university?

These activities impact our recruitment and retention efforts in a very positive way. Under a state grant, area high schools students have an opportunity to work as paid summer energy interns. Our undergraduate students get hands-on project management experience in a professional setting and have found key positions in the industry. Our graduate students benefit from the opportunity to pursue various applied research topics for their theses and have found employment with Fortune 500 companies. Our first graduate has started an Energy Management program at the school in Cyprus where he teaches. We are also working with our partners on a solar powered fuel cells project.

What is the greatest challenge facing your partnership?

The response has been overwhelming. We had a successful kickoff meeting on November 15 attended by about 70 persons. Twelve Rebuild America partners participated in discussions and set up exhibits. By now we have signed on about 20 partners. Thus our greatest challenge is to sustain the momentum that we have generated and to continue to build upon it.

For more information, contact Manohar Kulkarni at kulkarni@siu.edu or 618-453-3221.

Schools Earn ENERGY STAR® Label

Communities in Fort Collins, CO, are discovering both the joys and the rewards of energy efficiency. On November 14, four elementary schools in the Poudre School District were awarded the ENERGY STAR® label for buildings by the U.S. Department of Energy (DOE) and the U.S. Environmental Protection Agency (EPA). DOE's Rebuild America and EPA's ENERGY STAR® have worked hand-in-hand to assist school projects in gaining recognition and in developing local champions for energy efficiency.

The event attracted publicity and drew attendees from the school board, the Western Area Power Administration, Fort Collins Utility, EPA and DOE. Accepting the awards on behalf of the schools were principals Dave Benson, Olander Elementary; Bill Chenoweth, Werner Elementary; Larry Slocum, Harris Bilingual Elementary; and head custodian Jim Lofink, The Lab School of Creative Learning.

The school system's dedication to energy efficiency was instrumental in encouraging district-wide change. Poudre School District hired Stu Reeve to serve as its first energy and technical systems manager. Reeve has helped the district reduce energy costs by replacing outdated equipment with high-efficiency systems. He also ensures that all renovations and additions incorporate high-efficiency equipment. The district supports his efforts by continuing to provide necessary funding each year.

During the ceremony, Linda Smith, program manager of Rebuild Colorado, praised the school district as "a leader in Colorado, demonstrating the result of a long-lasting and steady commitment to energy efficiency."

Each of the four schools has implemented a variety of efficiency measures. Some have converted their steam heating systems to more modern hot water heating systems and natural gas steam heating with heat registers. Others have installed new doors and windows with automatic motorized shades, energy-efficient window glazing, fluorescent lighting with dimming systems, and daylighting measures. The schools' outstanding performance is the result of innovative design elements, integrated energy systems and staff dedication to energy efficiency.

Because of these efforts, the schools got high marks using the ENERGY STAR® benchmarking tool, the only national rating system for building energy performance. The rating system provides useful baseline information to help building owners set energy performance targets and plan energy-efficiency improvements.

For more information about the ENERGY STAR® label, visit www.energystar.gov. For more about the partnership, contact Stu Reeve at 970-490-3502 or email at stur@psd.k12.co.us.

Awards Corner

Rebuild America partnerships and the people behind them have been receiving honors from many quarters. Some snapshots of recent activity:

The Poudre School District in Colorado honored four schools that received the Energy Star Label. Accepting the awards, from left, are Dave Benson, Bill Chenoweth, Jim Lofink and Larry Slocum. (See story at left.)

The Portsmouth (OH) Metropolitan Housing Authority (PMHA) partnership was recognized on Oct. 26 for executing a performance contract for energy-efficiency improvements to 700,000 square feet of public housing with CMS/Viron Energy Services, a Rebuild America Business Partner. The $3 million performance contract is expected to cut energy costs by 25 percent for an estimated $200,000 in annual savings, according to George Horsley, PMHA modernization coordinator. From left, Richard Grimm, PMHA executive director, accepts an award from Sara Ward, chief of the Office of Energy Efficiency/Ohio Dept. of Development, at a press conference while PMHA Board Chair Emily Cobb looks on.

Schools were the focus of the Wisconsin Energy Initiative-2 (WEI-2) partnership's annual symposium on energy efficiency on Oct. 27, which drew over 200 participants. WEI-2 took this opportunity to honor a top performer. From left, Wisconsin Division of Energy Administrator John Marx and WEI-2 Program Manager Terry Pease recognize Patrick Bruckhart for his work to save energy in Wisconsin schools. The partnership has completed 18 million square feet of improvements to date, most of it in school buildings.

Building A Better Mousetrap

This cutting edge Pulte Home in Tucson, AZ, a collaborative effort of Building America's Building Science Consortium, was designed to reduce energy costs by as much as 50 percent.

Across the nation, Building America teams are constructing homes that offer the comfort and energy efficiency that homeowners want at costs that are comparable to that of traditional housing. Consortia members monitor the performance of Building America houses once families move in. Using test results and real-life data, the U.S. Department of Energy (DOE) documents the benefits of energy technologies and then supplies builders with case studies that show how to adopt similar strategies.

Findings of the Building America teams include the following:

- Improvements in the thermal integrity of a home's envelope allow for a reduction in the size and cost of its mechanical systems.
- Using advanced framing systems, such as setting wood studs farther apart and eliminating double top plates, allows more room for insulation and cuts labor and material costs.
- A tightly sealed house envelope, such as an integrated air-barrier system combining rigid foam sheathing glued to the framing with air-tight caulking of drywall, eliminates the need for separate polyethylene barriers and house wrap. For added comfort, a controlled ventilation system allows occupants to regulate airflow.
- By placing the heating system in a central location, installing energy-efficient windows, and improving the insulation, homebuilders can use shorter duct runs and cut material and installation costs by over 50 percent while saving energy.
- Reworking the infrastructure by placing ductwork, plumbing and wiring inside the conditioned space avoids interrupting the house envelope with entry and exit points.

Building America team research improves the quality and performance of today's homes and provides valuable information for homes of the future. By supporting the development of innovative building methods and technologies that achieve significant energy and cost savings, Building America is helping to guide the future of home building in this country.

For further information, visit www.eren.doe.gov/buildings/building_america.

High Performance Buildings Initiative Provides Roadmap

In 1998, the U.S. Department of Energy (DOE) began working with the building industry to develop a 20-year plan for research, development and deployment activities in commercial buildings. DOE acted as facilitator and brought more than 250 people from 150 building organizations together during four workshops. The result of these efforts is *High Performance Buildings: A Technology Roadmap*, completed and released in October 2000. The Roadmap recommends four strategies for commercial building activities:

- **Performance Metrics:** Establish key definitions and metrics for high performance commercial buildings.
- Technology Development: Develop systems integration, monitoring and other technologies that enable commercial buildings to optimally achieve targeted performance levels over their life cycles.
- Process Change: Create models of collaborative commercial whole-buildings design and development, and establish the tools and professional education programs needed to support these processes.
- Market Transformation: Stimulate market demand for high performance commercial buildings by demonstrating and communicating compelling economic advantages.

More information and background on the Roadmap can be found on DOE's web site: www.eren.doe.gov/buildings/commercial_roadmap. The web site includes downloadable copies of the roadmap in PDF format.

DOE has restructured its Commercial RD&D activities to match those

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Taking A Closer Look At Fuel Cells

Power parks…micro-grids… BCHP…6 nines…a whole new vocabulary is being created by energy professionals that reflects a growing interest in fuel cells and other distributed generation (DG) technologies. Why the interest?

For starters, utility restructuring is creating market demand for more energy-efficient systems, the nation's energy grid is becoming more costly and less reliable, end-users are tired of unpredictable energy prices, and diesel has fallen out of favor as a backup fuel.

The result is growing market demand for DG – energy production by small-scale, low-emission power generation and energy storage systems that are located near the end-user. Technologies such as microturbines, fuel cells, photovoltaics and wind turbines deliver more efficient, reliable and eco-friendly power to the end-user. Power parks may be set up in industrial parks, with DG power distributed via small grids, or microgrids.

Fuel Cell Specifics

In a fuel cell, an electron stream is produced when hydrogen-rich fuel passes over an anode and oxygen passes over a cathode, creating water vapor and heat as its byproducts. The fuel cell itself has no moving parts, making it a quiet and reliable source of power.

The phosphoric acid fuel cell is the only type of fuel cell commercially available for stationary applications. Fuel cells require auxiliary equipment to be integrated into existing systems, including a reformer, which isolates hydrogen from natural gas through steam reforming. Other equipment includes an inverter to convert DC to AC, controls to let systems communicate, and load-shedding devices for back-up fuel cell systems.

Fuel cells are currently providing clean power to the 4 Times Square Conde Nast Building in New York City, the First Bank of Omaha, NE, a New York Central Park police substation, a post office in Alaska, and several other locations. Rebuild America partnerships that have fuel cell projects include Sacramento, CA, Municipal Utility District and the City of Portland, OR. San Antonio's Bracken Bat Cave, home to over 40 million bats, and the City of Austin, with a burgeoning energy demand from data centers, are both interested in fuel cells and other DG technologies. Data centers require high reliability – in the order of 99.9999% – thus the "6-nines" reference.

Fuel cells can provide byproduct heat to cogeneration technologies and to microturbines for greater generation efficiency. Energy managers from the U.S. Army and intelligence base in Fort Meade, MD are installing a Siemens-Westinghouse fuel cell/microturbine system that will generate 1,000 kW of electricity. The system nearly doubles the efficiency of conventional power plants and will have the lowest environmental impact of any power plant using fossil fuel.

> *"The benefits to the nation of widespread fuel cell use are significant."*
>
> *NETL Fuel Cells Product Manager Mark Williams*

The most significant barrier to widespread stationary fuel cell application is the high cost of installation. Currently, 1 kW costs $4,000 to install. Larger office and multi-family units would require 100 kW at a cost that would be too burdensome for most building engineers.

The U.S. Department of Energy's National Energy Technology Laboratory (NETL) has launched the Solid State Energy Conversion Alliance (SECA) in an effort to substantially lower the cost of fuel cells. SECA will seek to develop a 3kW to 10kW solid-oxide fuel cell system with a factory cost of $400 per kW by 2010. The basic building block of the proposed future fuel cell will be a compact and light-weight, 5kW solid state module that can be accurately mass-produced.

Potential Benefits

Rebuild America has traditionally looked at energy efficiency as a way to cut back on coal and oil-based energy generation. Since its fuel is converted directly to electricity, a fuel cell can operate at much higher efficiencies than conventional technologies. DG's efficient energy production adds to the energy-efficient technologies and practices that Rebuild America promotes.

Rebuild America, Building America and High Performance Buildings participants should be aware of potential applications for fuel cells as the technology evolves into a viable energy source for buildings. Fuel cells can be an ideal alternative for hospitals, data processing centers, schools and other buildings that require a reliable back-up power source to maintain equipment. Locations with high-energy demands, unreliable generation and few sources of fuel are prime candidates for fuel cell installations. As fuel cells continue to advance and become available and affordable for many, Rebuild America partnerships and the communities they serve are likely to benefit from this clean and highly efficient means of generating electricity and heat in buildings.

For more information, contact Anne-Marie Borbely-Bartis of Pacific Northwest National Laboratory at am.borbely@pnl.gov; Doug Hinrichs of Rebuild America and the D&R Office of Distributed Resources at doug@drintl.com; or Distributed Energy Resources at www.eren.doe.gov/der.

Charette Explores Bat Cave, College Facilities

A cave in Texas that houses an estimated 40 million bats may soon be equipped to tell its story to a broad audience. Rebuild America joined Bat Conservation International (BCI) and other organizations at the San Antonio Renewable Energy Charette on November 27-28 to address design options for a visitor's center for this unique natural wonder.

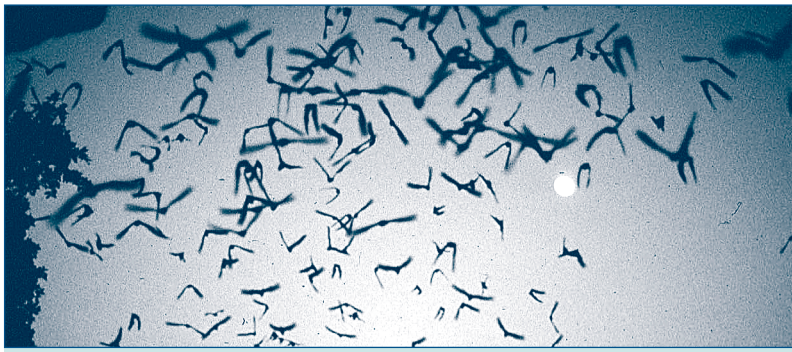
The charette was a first of its kind for Rebuild America, the event sponsor. Experts spent a full day brainstorming proposed plans for two San Antonio area projects: Bracken Bat Cave and facilities in the Alamo Community College District.

Situated in the midst of a 400-acre site just north of San Antonio, Bracken Cave is home to one of the largest communities of mammals in the world. The site is under the auspices of BCI, who acquired the site to permanently protect the bats and to create a visitor and research center that is as eco-friendly and energy-efficient as possible. Through this facility, BCI will educate visitors about the ecological and economic importance of bats and demonstrate the interdependence of humans, wildlife, land and aquifers. At the same time, the facility will model environmentally sensitive building design, innovative construction and resource conservation.

Charette participants considered strategies for new construction on a sensitive hill country site over the Edwards Aquifer Recharge Zone. The proposed facility is also in an off-grid remote location. John Thornton from the National Renewable Energy Laboratory (NREL) provided guidance on solar energy options. BCI and Overland Partners, AIA, are interested in using photovoltaics and fuel cells to provide peak-shaving power to the center, as well as geothermal storage and natural water treatment systems.

The session that focused on improvements to buildings in the Alamo Community College District was aimed at retrofitting existing buildings to improve energy efficiency and realize operational savings for the college district. The session generated some solid ideas on reflective roofing, daylighting, efficient T-8 lighting and electronic ballasts, improved motors for HVAC applications, and control systems for increased communications among energy systems.

The goal of the daylong charette was to provide energy consumption and generation solutions that meet environmental and budget criteria. Overland Partners, architects for the proposed Bracken Cave project, hosted the event. Laurence Doxsey of the U.S. Department of Housing and Urban Development coordinated the event locally. "One outcome of the charette is to explore ways to initiate charettes in other Rebuild America communities," says program representative Mike Myers, who helped arrange the charette.



Bats depart Bracken Cave on a moonlit night.

Participants included NREL, Office of Distributed Generation, University of Texas, Texas A&M University, CPS Solar Serve, Solar San Antonio, MetalOptics and Enlink GeoEnergy Services.

A presentation to City leaders and the public, held at the San Antonio Museum of Art, capped off the two-day event. *For more information, contact Mike Myers at mt4myers@aol.com or Doug Hinrichs at doug@drintl.com.*

Are Green Roofs The Answer?

When Greek soldiers returned from their travels in 600 B.C., they brought with them tales of the Mesopotamian city of Babylon and its lavish "hanging gardens." The city was overflowing with lush green plants and brightly colored flowers that dangled from atop temples and houses, providing its citizens with a relaxing atmosphere and a break from visual monotony. But all that's ancient history, right?

Not so, says Katrin Scholz-Barth, director of sustainable design at HOK Planning Group, based in Washington, DC, who recently presented a lecture on green roofs as part of the *Buildings for the 21st Century* lecture series, hosted by the U.S. Department of Energy (DOE) and held at the National Building Museum in Washington, DC.

In an effort to "begin a dialog between and among city planners, architects, engineers, artists, building owners and designers about green roofs' role in ecological planning," Scholz-Barth explored the design element she views as the natural choice for marrying the goals of energy-efficiency, environmental improvement and economic feasibility.

Why Green Roofs?

"Green roofs make environmental sense, serving as ecological multi-functional systems that *Continued on page 10*

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High Performance Buildings Initiative Provides Roadmap

identified in the roadmap.

To promote high performance commercial building design and construction, DOE recently launched the High Performance Buildings initiative. The purpose of this project is to:

- Promote and create examples of high performance buildings
- Provide tools and resources to support design, construction, commissioning, and retrofit
- Provide technical assistance
- Document process, successes and lessons learned

Efforts undertaken as part of the High Performance Buildings project include:

- Developing and documenting case studies, tools, guidelines and web-based resources.
- Developing and conducting workshops and charettes — training building owners, designers and occupants about how to create high performance buildings.
- Supporting building projects that set performance goals substantially higher than those typically in practice today:
  - For projects with energy-efficiency goals of 25 percent less than Standard 90.1, DOE and its team will provide project-specific technology evaluation/information.
  - For projects with energy-efficiency goals of 50 percent less than Standard 90.1, the DOE team will provide ongoing consultation for the project, beginning in early design, and commissioning through the first year of occupancy.

For more information about the High Performance Buildings project, visit http://www.eren.doe.gov/buildings/highperformance/. DOE is actively seeking candidate projects. If you know of a potential project, contact Dru Crawley of DOE at drury.crawley@ee.doe.gov.

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Are Green Roofs The Answer?

substitute for lost green space," says Scholz-Barth. "Vegetated roofs reduce the effects of urban heat islands, mitigate airborne dust, absorb carbon dioxide and release oxygen into the atmosphere."

Vegetated roofs also mitigate flooding, which accounts for an estimated 40 percent of natural disasters globally, she notes. Many environmentalists attribute the current increase in the frequency of flooding to the high rates (up to 75 percent) of rainwater run off in urban areas. Since plants and soil are able to absorb rainwater, green roofs can reduce run-off by as much as 75 percent.

"Green roofs are the single most effective solution to providing storm water retention," Scholz-Barth maintains.

Green roofs can also maximize the energy-savings of other efficiency measures in a structure. Temperatures atop traditional gravel roofs can climb as high as 175°F and cause dramatic temperature increases within a building, requiring sizeable energy outputs for cooling. By forestalling indoor heat gain in the summer and insulating against colder air in the winter, vegetated roofs decrease the temperature differential within a structure and minimize energy costs year-round. The useful life of a green roof is four to five times as long as traditional roofs, making them economically feasible, as well. And finally, green roofs provide a relaxing visual stimulus as well as a habitat for birds, butterflies and other creatures.

Getting Started

Scholz-Barth says that for the most part there are no building codes that limit the construction of these roofs and, likewise, there is no guidance to follow. However, many states offer incentive programs for businesses that undertake energy-efficient construction projects.

She suggests that a structural engineer determine the load that your building can bear. For extensive green roofs, which rely on just 1 inch to 3 inches of soil and sedum for plant growth, the minimum acceptable load is 15 lbs. per square foot. Intensive green roofs can serve as a habitat for humans and are much larger scale projects, requiring more than one foot of soil and sedum and as much as 100 lbs. per square foot load capabilities.

Scholz-Barth suggests that schools, which are often already involved in energy-efficiency projects, are prime candidates for vegetated roof installations. These projects do not interfere with or prohibit other energy-efficiency measures. Photovoltaic arrays can be placed alongside the roofs, which can also accommodate and air conditioning or ductwork.

"In the very near future, technology will permit photovoltaics to be installed as wall panels or windows, allowing buildings to integrate several energy-efficiency measures and leaving the roof to be vegetated," notes DOE Deputy Assistant Secretary Mark Ginsberg.

For more information about green roof applications, contact Katrin Scholz-Barth of HOK Planning Group at katrin.scholz-barth@hok.com. For technical information contact Dru Crawley at drury.crawley@ee.doe.gov

Rebuild Idaho: A Partnership In Action

Since its inception in 1997, Sue Seifert and Ken Baker have devoted themselves to taking Rebuild Idaho to the next level. As Rebuild Idaho program leader, Seifert spends her time facilitating partnership formation in Idaho school districts and communities. Ken Baker, assistant program leader, is there to supplant her efforts.

Taking a Team Approach

Baker and Seifert both work for the Idaho Department of Water Resources Energy Division. A team consultant and performance coach, Baker handles strategic plan development, program design, group facilitation and mediation for Rebuild Idaho, while Seifert's focus is on program design, organization and coordination, grant unity, contract development and community networking.

Both Seifert and Baker were prompted to action by Rebuild America's strong technical and policy support from the national level. They felt that this type of community-based program would allow them the freedom to meet their state's specific needs. The national program's flexibility and support structure helped pave the way for Rebuild Idaho to become the Energy Division's foundation program for community energy efficiency. Seifert and Baker have made good use of the program team's support and of Rebuild America's extensive materials.

The Idaho community has welcomed Seifert and Baker's efforts. Since both electric and natural gas costs have risen over the past year – natural gas by as much as 25 percent – there is a new focus on energy expenditures. Seifert and Baker have found that Idaho communities are ripe for participation as they begin to look more creatively at energy use and cost-effective efficiency solutions.

Making Rebuild Work for Idaho

Initially, Seifert and Baker decided to market Rebuild America within the context of economic development for communities. Business Partner leader Doug Avery's presentation materials proved to be influential in securing community buy-in. Today, Idaho communities seek out the program on their own, freeing Seifert and Baker to shift their focus from marketing to customer service.

To ensure effective customer service, Seifert and Baker serve as both facilitators and staff to their partnerships. Rebuild Idaho's approach is to hold a community's best interests in mind while seeking solutions to its specific issues. Empowering communities is key, which is why Seifert and Baker seek tools such as building operator training, utility tracking and performance contracting to allow partnerships to progress.

Idaho Champions

Seifert and Baker credit their first success story, the Idaho Falls School District, with making a big difference in the state. The school district met with quick success by realizing more than $8,000 in electric savings during a 10-day winter holiday break. Since then, Doug McGiffin of Idaho Falls Power, has created a utility management program for the school district that saves more than $45,000 annually through operation and maintenance procedure changes.

Another boost for the program has been its community advocates, such as Darrell Buffaloe from Idaho State University, who were willing to talk to others about their positive experiences with the Energy Division and Rebuild America. Other standouts include:

The City of Caldwell, led by Mayor Garret Nancolas, was the program's first city partnership – and the first to successfully use performance contracting.

Ada County's Director of Operations Dave Logan saw the value of Rebuild America almost two years ago. Since then, the County's Board of Commissioners has been a strong advocate of the program, implementing multiple projects.

Ken Baker and Sue Seifert

Within five years, Seifert and Baker predict that all of Idaho's major jurisdictions will be Rebuild America communities. They envision new efficiency programs created upon the foundation that has been laid by Rebuild America. Most importantly, they see school districts relying on the program as an investment structure – where energy and resource savings can fund the construction of new schools.

For more information about Rebuild Idaho, contact Sue Seifert at 208-327-7973 or email sseifert@idwr.state.id.us.

Upcoming Events

FEBRUARY

22 Rebuild America Strategic Partner Meeting, Washington, DC. Contact Ron Shelton at srl@ornl.gov or Sherry Sykes at Aspen Systems, 919-269-0908.

25-28 National Association of State Energy Officials Energy Outlook Conference, Washington, DC (Watergate Hotel). Visit www.naseo.org/events.

MARCH

6-7 Public Technology, Inc.'s Local Government Brownfield Technology Summit, Fort Worth, TX (Fort Worth Convention Center). Visit www.pti.org/news.

13-16 Rebuild America National Forum 2001, Atlanta (Westin Peachtree Plaza). Shared day with Greenprints conference on March 15. Visit www.rebuildforum.org.

14-16 Greenprints 2001, Atlanta (Westin Peachtree Plaza). Visit www.greenprints.org.

22-24 Building Energy 2001 Conference, Boston (Tufts University). Visit the Northeast Sustainable Energy Association web site at www.nesea.org or phone 413-774-6051.

24-27 National School Boards Association 61st Annual Conference, San Diego, CA. Visit www.nsba.org/conference.

APRIL

1-4 2001 National Town Meeting on Main Street, Indianapolis. Visit www.mainstreet.org.

18-21 "Transforming Government through Technology," Atlanta (Swissotel). Visit www.pti.org.

Partner Update Photographic Requirements

We welcome photos that help tell the story of energy-saving projects undertaken by Rebuild America, Building America and High Performance Buildings. We are interested in interior and exterior photos of your projects as well as photos of the people involved.

- **Photographic prints** are preferred because they allow us more flexibility in sizing the image. Prints will be returned upon request. Send prints to Elise Rand, Potomac Communications Group, 2025 M Street, NW, Suite 350, Washington, DC 20036. Ph: 202-466-7391.

- **Electronic images -** We can also receive images via email that meet the following parameters.

  - **Scanning a print** - use resolution of at least 300 dpi (dots per inch) and make sure the finished image is at least 3-by-4 inches, either horizontal or vertical. Do not send images scanned at 72 dpi.
  - **Digital camera images** - When shooting use settings that provide high resolution and the least compression to get the best image quality (at least 300 dpi). Save images as "jpg" files.
  - **Transmission** - You may need to compress image files (using Zip software) so you can successfully email them. The less you compress, the better. Email images for Partner Update to erand@pcgpr.com.

- **Captions** - be sure to include a description of the photo and to identify the people featured. If there are more than 10 people in the photo, identify one or two key people.

Check Us Out: www.rebuild.org or 1-800-DOE-3732

Rebuild America

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 where they live, work and play 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 to report on Rebuild America activities, *Partner Update* now incorporates news from Building America and High Performance Buildings, expanding on community-focused activities of the Office of Building Technology, State and Community Programs.

Building America U.S. Department of Energy

High Performance BUILDINGS

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