



# Buildings for the 21st Century

Fall 1999

News You Can Use

Office of Building Technology, State and Community Programs

## A Message from the Assistant Secretary:

### Building a New Approach

We are pleased to bring you the second issue of *Buildings for the 21st Century*. This edition contains more information about new efforts and programs in DOE's Office of Building Technology, State and Community Programs (BTS), and highlights the evolution of our new approach to making buildings more energy-efficient, comfortable, and affordable.

A major theme that runs throughout the changes accompanying the BTS reorganization is the cultivation of a more open and inclusive way of achieving our goals—a process that began more than three years ago with the development and publication of DOE's new Process Rule for setting energy efficiency standards for appliances. The 1996 rule established a more collaborative process, ensuring that stakeholder input is received early and often during the policymaking process. DOE has increased the number of information-gathering visits to manufacturers. In addition, an advisory committee established in 1996—consisting of representatives from manufacturers' associations, states, utilities, environmental groups, retailers, and consumers—is providing valuable information and advice for DOE's energy-efficient appliance standards process. BTS uses this open, participatory approach to encourage the development of innovative solutions by industry and efficiency advocates including the October 15 agreement on energy-efficient lighting standards (see "New Lighting Efficiency Standards Developed" on this page).

The BTS strategic plan (available at [www.eren.doe.gov/buildings/office.html](http://www.eren.doe.gov/buildings/office.html)) builds on our experience and success with the appliance standards program. It outlines the key elements of this new approach and commits other activities within BTS to following a similar, more participatory process. In the area of research, development, and deployment (RD&D), the new approach focuses on obtaining feedback from stakeholders to ensure the direction and success of next-generation research.

### New Lighting Efficiency Standards Developed

On October 15, Secretary of Energy Bill Richardson announced a new agreement between lamp ballast manufacturers and energy efficiency advocates to improve the energy efficiency of fluorescent lighting in commercial and industrial applications. The parties to the agreement have produced joint recommendations for new efficiency standards for electronic ballasts; these recommendations are expected to be accepted and written into the final standards during a final rulemaking by DOE. Under the terms of the agreement, the new efficiency standards will go into effect on April 1, 2005. Adoption of these standards could reduce residential and commercial energy use by more than 14 percent, which in turn will significantly reduce greenhouse gas emissions.

This goal is manifested in two new initiatives: the development of government-industry technology roadmaps and the introduction of competitive solicitations for selected projects. Working with industry and other stakeholders to develop technology roadmaps allows us to incorporate their input into RD&D decisions and better coordinate government resources with the building industry's research agenda. Over time, this will allow DOE to more effectively address the changing needs in each sector of the building industry, beginning with commercial buildings, lighting, HVAC equipment, and windows. Competitive solicitations for research projects ensure that research partners and projects selected are consistent with our technology roadmaps and are likely to result in the most effective use of our RD&D funds.

This new approach—expanding our partnerships and soliciting stakeholder involvement to help identify opportunities, set priorities, and plan and develop projects—will ensure greater effectiveness in reducing energy consumption in our country's buildings.

Dan Reicher  
DOE Assistant Secretary

## Partnership News:

### Redefining the Partnership with National Labs

Over the past quarter-century, the relationship between the DOE national labs and BTS has been a rich and productive one. DOE support for lab-based research has contributed to important technology breakthroughs such as electronic ballasts for fluorescent lights, vacuum-panel insulation, low-energy refrigerators, spectrally selective window glass, low-cost solar walls for pre-heating ventilation air, and architect-friendly energy design software. The labs have also contributed to recent BTS successes in bringing these efficient technologies to the market, through:

- Building codes
- Appliance efficiency standards
- The DOE/Environmental Protection Agency ENERGY STAR® program

The windows in this passive solar home have a heat reflective coating—a technology developed by national laboratory researchers. It not only saves energy but protects carpets from fading.



Credit: Dave Parsons, NREL

see *Redefining the Partnership with National Labs* on page two →



PAGE 2

ORNL's Buildings Technology Center is dedicated to improving the energy efficiency and environmental compatibility of buildings.



PAGE 3

Through a BTS technology procurement program, the sales of sub-CFLs has reached more than 280,000 and continues to grow.



PAGE 3

More than 1 million Energy Savers booklets have been distributed to homeowners.

- Promoting the use of ENERGY STAR® CFLs and other energy-saving measures in federal buildings (in cooperation with DOE's Federal Energy Management Program)
- Technical support for innovators at the state and community level, and in the private sector, through Rebuild America and Building America partnerships
- Utility planning and program evaluation
- Volume purchasing of energy-efficient products, and a host of other market transformation activities.

BTS leadership and senior managers at four national labs—Lawrence Berkeley National Laboratory, the National Renewable Energy Laboratory, Oak Ridge National Laboratory, and Pacific Northwest National Laboratory—decided to form the Buildings Lab Group, composed of senior BTS and lab managers who meet at intervals throughout the year. Calling themselves the "Bulldog Group," members of this informal forum have met three times this past year to discuss how the labs' historic roles might evolve in response to DOE's major new program thrusts:

- Strong and effective partnerships with industry and states
- Research activities that are competitively selected, peer reviewed, and guided by technology roadmaps developed in consultation with industry and other stakeholders
- An integrated approach to cost-effective, energy-efficient technologies and practices
- A more customer-focused organization that

Paul Torcellini, a researcher at NREL, analyzes the performance of a building's energy-saving features using software developed at NREL.

engages in increasingly effective, well-targeted actions to transfer technology to the market.

To illustrate several of these themes, a Bulldog subcommittee is finding ways for the labs and BTS to create effective, three-way collaborations with state energy offices and state research organizations. For example, by working with state organizations, the national labs are speeding up the introduction of advanced energy technologies in low-income housing. The nation's schools offer yet another target of opportunity. Lab experts are advising school boards and administrators on investments in energy-saving retrofit measures. They are helping school officials lower the costs of facility operation and maintenance while addressing the urgent need for new learning-oriented classroom space with environments that are also healthy, energy-efficient, and flexible enough to meet the future demands of our information age.

The Bulldog Group will continue to address other challenging issues, such as:

- Enlisting the labs to help strengthen existing BTS partnerships and create new ones, drawing on well-established ties to state and industry organizations
- Finding ways to create room for new ideas, innovative programs, and organizational renewal within an overall BTS budget that may be stable or subject to only modest growth



Credit: Warren Greitz, NREL

- Drawing on the strong multidisciplinary resources of the national labs to help the new BTS organizational teams integrate activities across traditional program lines and effectively link R&D efforts with both market-based deployment and DOE's codes and standards responsibilities
- Helping DOE link its energy efficiency objectives with important non-energy benefits, such as smarter and more reliable appliances; more competitive construction methods; flexible and durable building designs; and homes and workplaces that not only save energy and money, but are also more comfortable, healthy, and sustainable.

So why the name Bulldog Group? The simple explanation is that the term is an acronym (though somewhat awkward) for Buildings Lab Group. Of course, the real truth is far more subtle and meaningful. The group's very deliberate choice of a name calls to mind a bulldog's strength and steadiness, unswerving devotion, and fierce determination to succeed.

Barbara Sisson, DOE  
Jeff Harris, LBNL

## Lab Highlights:

### ORNL's Buildings Technology Center

The Buildings Technology Center (BTC) at Oak Ridge National Laboratory (ORNL) is a premier U.S. research facility devoted to the development of technologies that improve the energy efficiency and environmental compatibility of residential and commercial buildings. The BTC is designated a "National User Facility" by DOE and is supported by BTS. This designation means that the BTC facilities and staff are available to U.S. manufacturers, universities, and other organizations for proprietary and nonproprietary R&D. BTC staff will assist these organizations with identifying, developing, and deploying sustainable and energy-efficient building system technologies by forming partnerships for analysis, well-characterized experiments, technology development, and market outreach.

The BTC's unique lab and field-testing facilities are internationally recognized, especially in the areas of building materials and roof, wall, and foundation systems. With the best-equipped lab in North America for testing energy efficient HVAC systems, refrigeration systems and appliances, the Center is particularly strong in helping industry develop alternative (non-CFC and HCFC) refrigerants and blowing agents for foam insulation. At any given time, close to 100 field monitoring tests may be underway, ranging from measurement of the thermal performance of whole buildings or facilities to novel roof systems in multiple climates. The Center

is a national leader in existing building retrofit research with particular strength in weatherization of low-income housing.

The BTC staff includes experts in developing whole building simulation tools such as NEAT (the National Building Energy Auditing Tool), DOE-2, BLAST, and Power DOE. NEAT continues to evolve and is currently used by weatherization offices in 32 states. Today, NEAT saves the U.S. taxpayers millions of dollars each year in low-income housing energy costs. BTC staff author, maintain, and aggressively apply some of the most comprehensive and detailed heat transfer models such as HEATING. They are linked via memorandums of understanding with several of the foremost European labs in Germany, Finland, and Belgium. The DOE/ORNL Heat Pump Design Model, developed entirely at the BTC, is actively used by 30 percent of the U.S. unitary equipment market. This in-house capability keeps the BTC on the "cutting edge" of detailed heating and cooling component modeling and development.

While the BTC has a major commitment to perform DOE-supported research, DOE encourages BTC participation with others on energy efficiency projects. Currently the BTC is working with

more than 70 industrial users outside of DOE. They have 76 ongoing subcontracts, more than 200 Rebuild America partnerships, and active joint research projects with mechanical engineering or architectural programs at seven historically black colleges and universities. BTC affiliations with international energy agencies have them actively engaged with 25 foreign countries, helping each other improve energy efficiency around the world.

For more information, contact the Director of the BTC, Jeff Christian, at [jef@ornl.gov](mailto:jef@ornl.gov).



Researchers at ORNL analyze highly reflective roofing materials to quantify their long-term energy and durability benefits.

Credit: ORNL

## Partnership News:

### Partners in Progress

Let the new R&D in building technology begin! On September 2, 1999, DOE announced \$8.2 million in funding for the initial phases of 19 R&D projects, which will help stimulate the economy, save energy, and reduce pollution through building efficiency.

"Energy use in residential and commercial buildings account for approximately 65 percent of the

electricity and 40 percent of the natural gas used in the United States," says Secretary of Energy Bill Richardson. "These DOE grants will help create cleaner, more livable communities by increasing energy efficiency."

Recipients will provide additional funding through a 20 percent minimum cost-sharing agreement. This reflects the BTS commitment to conduct competitively selected research in collaboration with industry.

The R&D projects focus on water heating and appliances; cogeneration; lighting; heating, cooling, and ventilation; and the building envelope.

DOE's Federal Energy Technology Center will manage the projects. Through all phases, they will take one to four years to complete with a potential total cost of \$16 million.

An online newsletter supplement on the BTS Web site at [www.eren.doe.gov/buildings/](http://www.eren.doe.gov/buildings/) is coming soon with more information on this and other topics.

## 1,000,000 and Counting—BTS Publication Surpasses One Million

For the third year in a row, a BTS publication targeted at homeowners sets a new standard for distribution of DOE documents. Titled *Energy Savers—Tips for Saving Energy and Money at Home*, this handy, colorful booklet outlines the steps homeowners can take to make their houses more efficient. Since 1997, it has served as a cornerstone in DOE's yearly Energy Awareness Month campaign in October.

In its third printing this year, the booklet surpassed one million copies printed and distributed to homeowners. The key to the large distribution has been BTS' ability to team with private companies, state agencies, and local governments

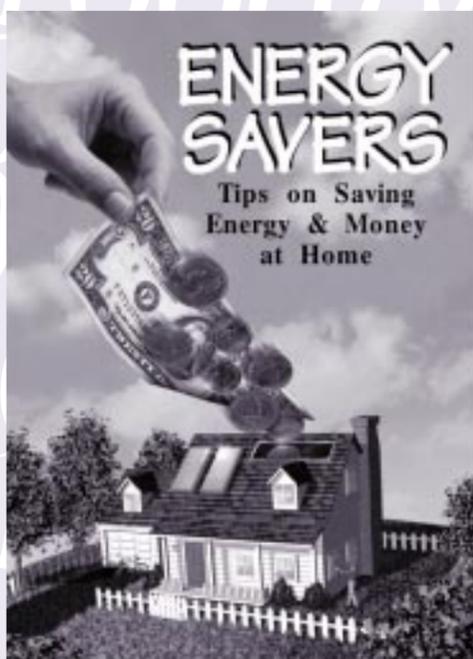
DOE's primary partner in this project, Owens Corning of Toledo, Ohio, has sponsored printing of the booklet for the last three years as part of their participation in Energy Awareness Month. During the past two years, more than 225 additional private companies, and state and local governments have joined with BTS using their own funds to purchase and distribute the *Energy Savers* booklets. In doing so, they promote energy efficiency to their homeowner customers and constituents.

**Altogether, these groups have accounted for almost two-thirds of the million booklets printed and distributed so far.** We continue to invite companies to participate in this venture with us. If you're interested in becoming a partner, contact us at [www.eren.doe.gov/energy\\_savers\\_partners/](http://www.eren.doe.gov/energy_savers_partners/).

The publication also has garnered numerous national and international awards, including:

- Society for Technical Communication's top prize at its 1998 international competition in the category of technical publications
- National Association of Government Communicators' first place in its national Blue Pencil/Gold Screen awards in the category of brochures for a general audience
- Creativity in Public Relations Award (CIPRA) from *Inside PR* magazine for the best social marketing campaigns of 1997 and 1998.

To obtain your free copy of the *Energy Savers* booklet, call DOE's Energy Efficiency and Renewable Energy Clearinghouse (EREC) at 800-DOE-3732. Or to view an animated version of the document online, visit our Web site at [www.eren.doe.gov/consumerinfo/energy\\_savers](http://www.eren.doe.gov/consumerinfo/energy_savers).



## Regional News:

### Atlanta—Sponsors an Energy-Efficient Financing Workshop and Teaches Physics

The Building Owners and Managers Association of Atlanta, Inc. (BOMA Atlanta)—in conjunction with the Metro Atlanta Chamber of Commerce, Georgia Power, Rebuild America, and Southface Energy Institute—hosted a special workshop on the nuts and bolts of financing energy-efficient upgrades in commercial and institutional properties in November. The agenda included presentations on financing options and proposal writing techniques. Successful project managers and financiers were available to share information and experiences.

On September 28, 1999, the school board of Little Rock, Arkansas, hosted a kick-off breakfast for high school physics teachers. The breakfast preceded a two-day training session on a DOE-sponsored education module designed to teach high school students to audit their school's lighting system. The audit will be used in conjunction with a new freshman physics course entitled *Active Physics*. The course will not only help students develop energy-efficient alternatives and present their findings, but will give school administrators advice on energy efficiency measures. For more information on the workshop and education module, contact the Atlanta Regional Office at 404-347-2696.

### Seattle—Serving the Diverse Rebuild America Program

The region served by the Seattle Regional Office (SRO) is huge and diverse. Stretching from the Arctic Circle to the Mexican border out across Hawaii and the Pacific Ocean, it includes a wide array of climates, economies, cultures, and energy resources. Communities in this region have become actively involved in Rebuild America as a way to capture energy efficiency opportunities in this diverse region. Partnerships are addressing markets in communities ranging from green buildings, to local government buildings, public housing, schools, and small commercial buildings. The Rebuild America program in the Seattle region started small and has grown rapidly over the past couple of years. It currently has 77 Rebuild America partnerships—about a third of the national total. Partnerships are found in all of the region's eight states plus Guam and American Samoa. To build and support this program, SRO uses peer exchange—Rebuild America partners recruit new partners into the program and provide assistance to existing partners. For more information, contact the SRO's Rebuild America program at 206-553-2154.

## Smaller CFLs Mean a Bigger Market Share

Most U.S. households spend nearly \$110 every year on electricity to light their homes. If each of those households replaced just five of the most used lights in the house with ENERGY STAR®-labeled compact fluorescent lamps (CFLs), each household could save more than \$35 each year on their energy bills. Super efficient CFLs are not only good for your pocketbook, they also help the environment, because they use less electricity and therefore reduce the pollution that comes from power generation. If every U.S. household replaced just one 60-watt incandescent lamp with a 15-watt ENERGY STAR® CFL, the reduction in pollution would be the same as removing one million cars from the road.

CFLs use about one quarter of the electricity and last up to 10 times longer than typical incandescent light bulbs. But CFLs have had limited success in penetrating the U.S. market. Market research conducted by DOE reveals that one of the primary barriers to the wider use of CFLs has been their failure to fit in most common lighting fixtures. To help overcome this barrier and speed the introduction of smaller CFLs to U.S. consumers, DOE designed a technology procurement program that was initiated a year ago through BTS (see "Helping Industry Introduce Energy-Efficient Products to the Marketplace" on this page).

BTS' subcompact fluorescent lamp (sub-CFL) technology procurement program has succeeded in bringing many smaller and more affordable energy-efficient lamps to the marketplace. Three suppliers, SunPark Electronics Corp. of Torrance, California, Lights of America of Walnut, California, and JKRL USA of Casselberry, Florida, presently participate in the program, and an additional manufacturer's products are being evaluated for inclusion. Sales to date exceed a quarter of a million units and continue on a strong upward trend.

The small CFLs sold through the program must pass rigorous performance tests, and buyers report a high level of satisfaction with their new lamps. The program suppliers have enthusiastically embraced the ENERGY STAR® specifications for CFLs and are using the ENERGY STAR® label on many of their products. ENERGY STAR®, a joint DOE/U.S. Environmental Protection Agency program, promotes the benefits of energy efficiency to consumers by labeling highly efficient lamps, heating and cooling equipment, appliances, windows, home electronics, office equipment, and many other products.

For more information regarding the sub-CFL technology procurement program, please contact Marc LaFrance at 202-586-8423 (or [www.pnl.gov/cfl](http://www.pnl.gov/cfl)). For more information on the CFL ENERGY STAR® program, please contact Bill Noel at 202-586-6149 (or [www.energystar.gov](http://www.energystar.gov)).

### Helping Industry Introduce Energy-Efficient Products to the Marketplace

Technology procurement is an approach used by DOE to pull new technologies into the market. Working closely with both potential high-volume buyers and manufacturers, DOE collaboratively develops technical specifications for highly efficient products. Once the specifications are set, a competitive solicitation is issued to invite manufacturers to develop new products that meet buyers needs. Manufacturers who meet minimum technical specifications and have the highest scoring bids are then selected to supply their products to buyers through the program. The products are sold directly to buyers, without DOE's involvement or subsidy. All products sold through the sub-CFL project were introduced to the U.S. market through the program; many of them were designed specifically in response to the aggressive technical specifications set through DOE's collaborative efforts.



Like thousands of other users, Dagmar Eggleston of the Rose Villa Retirement community in Portland, Oregon, found that her new sub-CFLs fit where other CFLs wouldn't.

Credit: Linda Sandahl, PNNL



## BTS Meetings, Events & Conference Calendar

Date	Meeting Event Conference	Contact
November 29 -December 2, 1999	Weatherization National Conference St. Louis, Missouri	Geri Millman 301-589-0100
December 12-14	FEMA Project Impact	Joe Konrade 202-586-8039
January 14-17, 2000	International Builders' Show Dallas, Texas	www.nahb.com Hotel Info: 800-BUILD-06
February 6-8, 2000	Greenprints 2000: Sustainable Communities by Design Atlanta, Georgia	Gretchen Gigley 404-872-3549 www.southface.org
March 2000	The National Green Building Conference	Exhibit Info: Michelle Gearen 847-390-2106 800-638-8556 www.nahbrc.org
April 2000	Soltech 2000	Michelle Crespo 301-941-2553 Fax on demand: 888-685-3461 www.seia.org
April 2000	2000 State Energy Program	J. Williams 800-72-ENERGY jwilliams@energy.state.md.us www.energy.state.md.us

### Solicitation Notice

Look for BTS' competitive R&D solicitation coming early this winter. This solicitation is being managed by the Federal Energy Technology Center (FETC). To register online for procurement announcements, visit the FETC Web site at [www.fetc.doe.gov/business/index.html](http://www.fetc.doe.gov/business/index.html) and click on Business Alert Notification.

## Two BTS Web Sites Redesigned

Check out the new and expanded features on the Building America Web site at [www.eren.doe.gov/buildings/buildingamerica](http://www.eren.doe.gov/buildings/buildingamerica) and the Rebuild America Web site at [www.eren.doe.gov/buildings/rebuild](http://www.eren.doe.gov/buildings/rebuild).

### Credit Omission

In our first newsletter issue, we inadvertently omitted photo credit to Hedrich Blessing and text credits to Burt Hill Kosar Rittelmann Associates in reference to the Grafton Middle School/High School in our EnergySmart Schools article (pgs. 1 and 2). We also incorrectly reported the location of the school, which is in Yorktown, Virginia (not in Virginia Beach as the article stated).

### Credits

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The Buildings for the 21st Century newsletter is published quarterly by the Office of Building Technology, State and Community Programs of the U.S. Department of Energy, Office of Energy Efficiency and Renewable Energy.

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## Web Feature:



## The EnergyPartners Web Site—A New Way to Access Data

What is BTS doing in my state? Who's the contact for the Rebuild America project in my hometown? What do the Building America projects in my state involve? These and many other questions can be answered on our new EnergyPartners Web site at [www.eren.doe.gov/buildings/energypartners](http://www.eren.doe.gov/buildings/energypartners).

EnergyPartners is a national database of historical projects under BTS programs: Building America, Rebuild America, Weatherization, the State Energy Program, Affordable Housing, Cool Communities, and the Municipal Energy Management Program. We designed EnergyPartners for two audiences: DOE employees involved with BTS programs, and the general public—anyone who's interested in BTS programs. Therefore, some of the information for DOE's use is password protected.

"EnergyPartners was also designed with different information pathways for accessing data in an effort to accommodate each viewer within this broad audience," says Lani Macrae, BTS Communications Specialist. From the home page, you can begin to navigate the site in the following ways:

- **Pick a State-Project Locations:** Just click on a state from the map provided or select one from a scroll box. You will then have access to links with specific information about the state's energy programs, including state-based and community-based programs, as well as NASEO and regional office links.
- **Program Descriptions:** Select a program for a brief description and a listing of all its projects.
- **State Fact Sheets:** Click here to access PDF files of state fact sheets on BTS economic investments.
- **Advanced Search:** Click here to access the EnergyPartners search engine. You can do a Keyword Search or a Detailed Search by program, project, contact, city, state, and zip.

DOE employees, who can login into the database with a password, can also generate a mail merge list of contact persons. Click on **Help with the Site** from the home page for instructions.

"The beauty of this database is that each program can easily update its own information as needed," Macrae says. "One can just log into the Web site with a password, and either type in the information directly or upload an Excel spreadsheet."

In the future, we envision that EnergyPartners will evolve to include information on more BTS programs, and it could possibly even move beyond BTS to include other DOE programs.

Visit EnergyPartners to see how it might help provide you with BTS program information. Let us know if you have any difficulty finding what you need or if there's any information you'd like us to add. To comment on the Web site, e-mail the Webmaster using the link provided at the bottom of the home page or send an e-mail to [Patricia\\_Plympton@nrel.gov](mailto:Patricia_Plympton@nrel.gov).

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Address Correction Requested

November 1999

DOE/GO-10099-932

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