BUILDING ENERGY CODES PROGRAM

Setting the Standard

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

April 2009

ARRA Opportunities

The energy codes community will benefit from financial incentives to improve building energy efficiency that are part of the Obama administration's $787 billion economic stimulus. Formally called the American Recovery and Reinvestment Act (ARRA), the measure focuses on stimulating the U.S. economy through both public-sector spending and tax credits, with a heavy focus on infrastructure and energy.

Billions of dollars are allocated per the ARRA to the U.S. Department of Energy Office of Energy Efficiency and Renewable Energy (EERE). States may be eligible for ARRA funding through EERE for State Energy Program (SEP) as well as Energy Efficiency and Conservation Block Grant (EECBG) assistance. The Building Energy Codes Program (BECP) is offering support for energy code-related provisions in the ARRA.

SEP: $3.1 billion

The ARRA provides $3.1 billion in SEP grants and direct funding that do not require matching state funds. Each state's and jurisdiction's eligibility for this assistance is dictated by code adoption and enforcement requirements. A key excerpt per these requirements for states follows from the *Financial Assistance Funding Opportunity Announcement* (page 26, accessed from www.energycodes.gov/news/arra).

(2) The State, or the applicable units of local government that have authority to adopt building codes, will implement the following:

(A) A residential building energy code (or codes) that meets or exceeds the most recent International Energy Conservation Code, or achieves equivalent or greater energy savings.

(B) A commercial building energy code (or codes) throughout the State that meets or exceeds the ANSI/ASHRAE/IESNA Standard 90.1–2007, or achieves equivalent or greater energy savings.

(C) A plan to achieve 90 percent compliance with the above energy codes within eight years. This plan will include active training and enforcement programs and annual measurement of the rate of compliance.

Initial Applications for assistance were due March 23, 2009. Comprehensive Applications are due May 12, 2009. Complete details are available at http://apps1.eere.energy.gov/wip.

BECP: Helping reach 90% compliance

DOE realizes that the rate of compliance with energy codes will be difficult and costly to determine with precision and accuracy. To help states uniformly address their respective rates of compliance, BECP is developing procedures that states can readily apply to measure and express compliance with building energy codes.

These procedures will be made available to states as they begin to address the energy code-related provisions of the ARRA. They will include (1) an assessment of the processes associated with code implementation and enforcement and (2) an assessment of the performance of real buildings. The procedures will be accompanied by support tools that will allow each state to effectively address compliance verification.

If you are interested in providing feedback on a preliminary draft of the guidelines or support tools, please identify someone in your office to serve as the primary point of contact between BECP and your state on this issue and email the individual's contact information to techsupport@becp.pnl.gov.

For more information on the ARRA visit www.recovery.gov.

EECBG: $3.2 billion

The ARRA provides $3.2 billion to the EECBG Program for states, local governments, Indian tribes, and U.S. territories to reduce energy use and fossil fuel emissions and to improve energy efficiency through measures, including building code upgrades and inspections to promote building energy efficiency. Nonprofits and governmental agencies may also use these grants for performing energy efficiency retrofits and developing energy efficiency and conservation strategies. EECBG is part of the Energy Independence and Security Act of 2007. For details, visit http://apps1.eere.energy.gov/wip/block_grants.cfm.

Tax incentives and more

The ARRA modifies and expands the scope of many energy efficiency and renewable energy tax incentives. In particular, the ARRA extends consumer incentives through 2010 and increases the cap on efficiency incentives from $500 to $1,500 per household. An overview of the legislative changes and details on the individual measures can be found on the Tax Incentives Assistance Project website, www.energytaxincentives.org.

Provisions, including tax incentives, that could bring opportunities to the building sector, include:

- Tax credits for the production of renewable energy are extended until at least 2012
- Research expenses associated with renewables, conservation, and carbon capture and sequestration could result in higher credits in 2009 and 2010
- DOE is authorized to provide grants up to 30% of the cost of installation of items such as fuel cells, solar, small wind, geothermal heat pumps, and combined heat and power systems
- EERE is receiving $21.4 billion for research, weatherization assistance, grants, and other programs
- The Department of Labor is allocated $750 million for job training, with significant focus on emerging industry sectors, including energy efficiency and renewable energy
- Federal agencies are allocated considerable funds for retrofitting and upgrading existing facilities to meet Federal energy and water-use requirements and alleviate any maintenance backlogs.

BECP: Additional support

BECP staff are incorporating support for the 2009 International Energy Conservation Code® (IECC) into BECP's code-compliance software, RES*check*™ and COM*check*™, and will release new versions no later than September 2009. In addition, 2009 IECC-related training and support materials will be available by the summer of 2009.

BECP looks forward to supporting the energy codes community in their ARRA-related efforts. To provide feedback, ideas and suggestions for how BECP can help you best, contact BECP at techsupport@becp.pnl.gov.

Energy Codes 2009

July 27-30, 2009
Portland Marriott
Downtown Waterfront
Portland, Oregon

Mark Your Calendars!

This year's **Energy Codes** training event is **July 27-30** in Portland, Oregon.

Registration is now open!

For more information and to register, visit the Building Energy Codes Program website at www.energycodes.gov/news/ecodes2009/index.stm.

Now is the time for Building Energy Codes!

Sessions for the 2009 event include:

- ✓ How the American Recovery and Reinvestment Act is related to building energy codes
- ✓ Compliance issues, requirements, and solutions
- ✓ Reaching the U.S. Department of Energy's 30% goals – what does it really mean?
- ✓ The Road to the 2012 International Energy Conservation Code®
- ✓ ANSI/ASHRAE/IESNA Standards 90.1-2007 and 90.1-2010
- ✓ Status of state codes, code adoption, and advocacy

What would you like to learn about at *Energy Codes 2009*? Send your ideas and suggestions for *Energy Codes 2009* to techsupport@becp.pnl.gov.

Building Energy Codes
U.S. Department of Energy

Raising the Standard of Energy Efficiency

The Building Energy Codes Program (BECP), in close collaboration with the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE), is making solid progress toward their common goal of increasing the energy efficiency of ANSI/ASHRAE/IESNA[1] Standard 90.1-2010 by 30% relative to the 2004 version of the Standard. This progress is well represented by the number and measureable impact of addenda incorporated into the Standard already.

To date, 66 addenda have been added to Standard 90.1-2004 and/or Standard 90.1-2007. BECP's analysis shows that these addenda will result in an estimated energy savings of 8% in Standard 90.1-2010, just over one-fourth of the way to the 30% goal. In addition, ten more addenda to Standard 90.1-2007 have been submitted for public review.

Addenda incorporated into the Standard

Analysis of the 66 addenda incorporated into Standards 90.1-2004 and/or 90.1-2007 shows progress in energy savings for 5 building types in 17 climates. Savings vary based on climate and the degree to which the Standard changes in different Climate Zones.

Savings Ranges for Prototypes	
Large office	4% to 12%
Medium office	8% to 15%
Mid-rise apartment	6% to 13%
Warehouse	5% to 10%
Hospital	-11% to +5%

Note that the decrease in savings for hospitals and the low value for savings associated with hospitals in general are primarily because of changes to ventilation requirements in Standard 62.1, ASHRAE's ventilation standard for commercial buildings, and are not directly related to Standard 90.1 changes.

Addenda for public review

Ten addenda to Standard 90.1-2007 have been submitted for public review. The public review process is the opportunity for users of the Standard to comment and offer guidance on proposed Standard requirements. The window to submit comments for seven of the ten Standard 90.1-2007 addenda is closed, but comments may still be submitted until May 4 for the remaining three, which follow.

1. **BSR/ASHRAE/IESNA Addendum r to ANSI/ASHRAE Standard 90.1-2007, Energy Standard for Buildings Except Low-Rise Residential Buildings (Third Public Review Draft - ISC) –** removes the use of a Conservative Engineering Factor to reduce the savings when using the exceptional calculation method and removes requirements to compare the method used with other simulation programs that might be able to simulate the item directly.
2. **BSR/ASHRAE/IESNA Addendum ax to ANSI/ASHRAE Standard 90.1-2007, Energy Standard for Buildings Except Low-Rise Residential Buildings (First Public Review Draft) –** modifies requirements for kitchen exhaust.
3. **BSR/ASHRAE/IESNA Addendum bb to ANSI/ASHRAE Standard 90.1-2007, Energy Standard for Buildings Except Low-Rise Residential Buildings (First Public Review Draft) –** updates the building envelope requirements for opaque elements and fenestration in Standard 90.1-2007; in addition, text and appendix changes relate to the prescriptive criteria tables.

See Standard 90.1-2007 addenda available for public review at www.energycodes.gov/news/ashrae_review.stm.

Determinations: Standards 90.1-2004 and 90.1-2007

In December, the U.S. Department of Energy (DOE) released its determination for ANSI/ASHRAE/IESNA Standard 90.1-2004. The determination states that commercial buildings built to Standard 90.1 2004 save about 13.9% more source energy (all energy consumed onsite by the building, including generation and transmission losses), on a national basis, than commercial buildings built to Standard 90.1-1999. Determinations are based on analysis by DOE and are required by Section 304 of the Energy Policy and Conservation Act (EPCA, Public Law 94-163), as modified by the Energy Policy Act of 1992.

Per the December Determination, Standard 90.1-2004 is now the new commercial building reference for state building energy codes. States are required by the Energy Policy Act of 1992 to certify that their state building energy codes are at least as stringent as 90.1-2004, or justify why they cannot comply, within two years from the time DOE publishes an affirmative determination in the Federal Register.

DOE expects to release its official determination for Standard 90.1-2007 in early summer of 2009. Initial estimates indicate that Standard 90.1-2007 is 3-5% more stringent than its predecessor. Some state funding in the American Recovery and Reinvestment Act of 2009 is tied to Standard 90.1-2007. States may choose to adopt Standard 90.1-2007 before the determination is announced.

Learn more about determinations in BECP's article *All you ever wanted to know about energy code determinations* at http://www.energycodes.gov/codedevelop/determinations_process.stm.

[1]The American National Standards Institute/ASHRAE/Illuminating Engineering Society of North America

Challenging the Status Code

Building Energy Codes Program staff are traveling fast on the road toward a common goal shared by the U.S. Department of Energy (DOE) and many members of the energy codes community to reduce the energy consumption of residential building features regulated by the 2012 International Energy Conservation Code® (IECC) by 30% compared to the 2006 IECC. This contribution to *Setting the Standard's* residential article series highlights three major developments pertaining to the 30% goal:

- **Publication of the 2009 IECC** – a significant measure of success
- **Changes to the International Code Council® (ICC) process** – a strong step to streamline code development
- **Assembly of the energy codes community** – an important effort to foster collaboration.

The 2009 IECC has arrived

The 2009 IECC has been published and is now available for order through the ICC online at www.iccsafe.org.

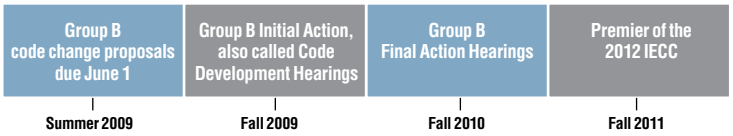
The new code is more stringent than its 2006 predecessor and sets a new, more energy efficient baseline for IECC-compliant low-rise residential buildings. In fact, more energy efficiency improvements are included in the 2009 IECC than ever before approved in a single code change cycle.

Although little time has passed since its release, some states have already taken measures to adopt a code equivalent to or even more stringent than the 2009 IECC. Additional states are in the process of reviewing the new code for adoption.

ICC streamlines code development process

After several years of gathering input from members and industry, the ICC Board of Directors has revised the Code Development Process (CDP). As reported by ICC, the new CDP will maintain the three-year publication cycle and ICC Governmental Consensus Process, eliminate the need for Supplements to the IECC, reduce the length of ICC hearings, and increase participation.

Per the new CDP, codes have been divided into two groups, Group A and Group B. The IECC belongs to Group B. The 2012 IECC will be produced during the transition period in which the ICC will facilitate a move from its old process to its new process. The timeline for this transition follows.



For more detail about the new ICC process, see www.iccsafe.org/cs/codes/schedule_advisory.html. Stay tuned to www.iccsafe.org to learn when dates are set for each step of the new process.

Collective Energy – Energy codes community assembles to support 30% goals

On January 13, 2009, DOE hosted nearly 50 professionals, representing almost 40 organizations involved in the energy-code-making process, in Washington, D.C. The meeting was the first in a series of meetings – the second of which occurred in Denver on February 6, 2009 – focused on developing a set of proposed changes to the IECC that is supported by all interested and affected parties and can be collectively submitted by the ICC's June 1, 2009 deadline.

Typically, different parties submit their code change proposals separately. By submitting a single set of collaborative changes, the ICC's CDP can be further streamlined. This collaborative effort is ongoing such that collaborators post their anticipated proposals to a shared website; differences are then identified and collaboration is facilitated to reach common proposed changes on specific issues.

The first step in the process subsequent to ICC's June 1 submittal deadline will be the publication of all proposed changes to the ICC codes. A hearing on the proposed changes will then be held in late October/ early November before various ICC code change committees whose members will vote on a recommended disposition of each proposed change.

> By submitting a single set of collaborative changes, the ICC's CDP can be further streamlined.

Read the full version of BECP's *Collective Energy* article at www.energycodes.gov/news/items/012109_collective.stm.

Please note that the article referenced was written prior to ICC's announcement of the new June deadline for code change proposal submittals and, therefore, reflects the original April 24 deadline.

Ask an Expert

Every month, the Building Energy Codes Program's (BECP) Technical Support team responds to hundreds of code-compliance inquiries from builders, architects, engineers, and code officials from around the country. Every issue of *Setting the Standard* offers frequently asked questions from the codes community and answers from BECP's codes experts.

Residential

Question: I'm using 3.5 inches of spray foam insulation in a 2x6 wall cavity. That thickness of foam has an R-value of about 13.5, but when I enter that into RES*check*™, the software thinks I'm using a 2x4 wall. Is this a problem?

Answer: RES*check* assumes any R-value of 15 or less is a 2x4 wall, to correspond with common fiberglass batt thicknesses. In your case, that assumption is conservative – it will slightly underestimate the insulating power of your wall assembly. For code compliance purposes, there is no problem. But you may wish to manually enter the U-factor of your wall by choosing the "Other" wall type, to get full compliance credit for your configuration. The table below provides U-factor estimates found in ANSI/ASHRAE/IESNA Standard 90.1-2007, for this type of assembly.

Foam depth (inches)	Wall dimensions (feet)	On Center wood frame dimension (inches)	U factor
3.5	2x6	16	0.077
3.5	2x4	16	0.089
3.5	2x6	24	0.076
3.5	2x4	24	0.086

Question: I'm using spray foam wall insulation, and the manufacturer claims it has an effective R-value better than that of fiberglass because of improved (lessened) air leakage. Can I account for this in RES*check*?

Answer: No. RES*check's* compliance is based on the conductive thermal properties only. Air leakage is dealt with separately in the code.

Commercial

Question: I am planning to build a 60 x 60-ft airplane hangar with 14-ft walls in Nevada. The structure will be a pre-engineered steel building with concrete floors. There will be a 45-ft-long x 12-ft-high motorized overhead door and one exterior man door. The interior walls will not be insulated, but the ceiling will be insulated for moisture control. In one corner I will install a 6 x 6 x 8-ft wood framed, heated bathroom. I plan to use several 400-watt high-intensity discharge lighting fixtures.

There will be several electrical receptacles inside the building. There will be no heating system with the exception of the bathroom, which will have an electric baseboard heater. All electrical devices will comply with the National Electric Code® provisions for a hangar. I have been told that I must comply with the provisions of COM*check*™, but COM*check* does not seem to speak to this type of construction. Does COM*check* apply to small aircraft hangars of this type?

Answer: BECP's records indicate that Nevada is using the 2006 International Energy Conservation Code® (IECC). The 2006 IECC does not contain any explicit exemptions for buildings of your description. The 2006 IECC Section 501.1 allows you to use either the 2006 IECC or ANSI/ASHRAE/IESNA Standard 90.1-2004. Standard 90.1-2004 contains a special set of envelope requirements for buildings that are not heated to full comfort conditions, but rather merely for freeze protection. Designation of these spaces as semi-heated or unconditioned must be approved by the code official in zones 3 through 8 where Nevada is located (Section 5.1.2.3.). ASHRAE defines these buildings in terms of the total heating system output in Btu/h-ft^2. Depending on where you are in Nevada, your building could have a heating system with a capacity of 10-15 Btu/h-ft^2 and still qualify for the less stringent semi-heated envelope requirements.

You can use COM*check* to show compliance with your envelope design by choosing a building type that allows use of the semi-heated requirements: use the whole-building approach, and specify the building type as "warehouse," which COM*check* includes under storage for such buildings as hangers, garages, storage buildings, and freight depots. The lighting system in your building is there for human use. Therefore, you will need to comply with either the lighting requirements in the 2006 IECC or those found in Standard 90.1-2004; you can use COM*check* to show compliance to your lighting design.

Email questions about residential and commercial energy codes to BECP Technical Support at techsupport@becp.pnl.gov, or submit an inquiry at www.energycodes.gov/support/helpdesk.php.

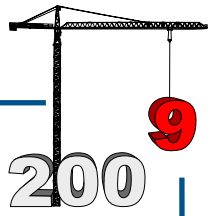
Please note that any views or opinions that may be presented in this newsletter feature, *Ask an Expert,* are solely those of the author(s) and do not necessarily represent those of the program or DOE. The governing jurisdiction, in which the project is located, has the final authority for all energy code issues. This organization is not liable for the consequences of any actions taken on the basis of the information provided.

Training Events

Over 2500 attendees viewed the live airing of the Building Energy Codes Program's (BECP's) two newest webcasts: *RES*check *Basics* and *COM*check *Basics*. Other recent webcasts that may be of interest to the energy codes community in light of the American Recovery and Reinvestment Act and its provision for State Energy Program grants are (1) BECP's three-part series on ANSI/ASHRAE/IESNA Standard 90.1-2007 lighting, mechanical, and envelope requirements as well as (2) the three-part series on ASHRAE's Advanced Energy Design Guides.

All of BECP's recorded webcasts are available at www.energycodes.gov/training/onlinetraining/videos.stm. Recorded webcast viewers can earn American Institute of Architects Continuing Education System Learning Units.

Next, BECP is planning to offer a two-part webcast series on requirements of the 2009 International Energy Conservation Code® (IECC). The first will focus on the residential requirements in the 2009 IECC, and the second on commercial requirements. American Institute of Architects Continuing Education System Learning Units will be offered for these no-cost events. These webcasts are tentatively scheduled for May and June; watch www.energycodes.gov for exact dates.



Calendar of Events

What's going on?

June 10-11, 2009 17th National Conference on Building Commissioning in Seattle, Washington. See www.peci.org.

June 20-24, 2009 ASHRAE 2009 Annual Conference in Louisville, Kentucky. Contact www.ashrae.org.

July 27-30, 2009 Energy Codes 2009 in Portland, Oregon. See www.energycodes.gov.

Add your event to the BECP calendar!

The Building Energy Codes Program calendar is populated by the codes community, for the codes community. Anyone can add to the calendar, which displays local, regional, and national information. View upcoming events and training opportunities or submit one of your own at www.energycodes.gov/events/index.php.

Software Updates Released and on the Way

CheckMATE REScheck™ COMcheck™

What's New?

RES*check*™ version 4.2.1 was released in February and includes a request from the City of Chicago to change from Climate Zone 5 to Climate Zone 6 and for users to show compliance to the 2006 International Energy Conservation Code® (IECC) as well as updates to a number of equipment efficiency tradeoff calculations enabled under the 2006 IECC. It also fixes problems with specifying mass walls under the Minnesota code and raised energy truss roof assemblies under the 2006 IECC for Climate Zones 1, 2, and 3. A number of user interface changes were made, including improved rounding of compliance results, temporary report folder usage, and version update checking.

COM*check-Web*™ was deployed in March with support for ANSI/ASHRAE/IESNA Standard 90.1-2007 and exterior lighting compliance in applicable codes. The new version also includes redesigned mechanical inputs and allows resizable table columns; pop-ups; and increased support for more browsers, including Safari.

Access the latest RES*check* and COM*check* downloads as well as web-based versions of the software at www.energycodes.gov/compliance_tools.stm.

Coming Soon!

The Building Energy Codes Program has been fielding a strong influx of inquiries relating to the release schedule for RES*check* and COM*check*™ versions that will support the 2009 IECC. BECP staff are working hard to implement the 2009 IECC in the software. Updates will be released no later than September 2009.

U.S. Department of Energy
Energy Efficiency and Renewable Energy
Bringing you a prosperous future where energy is clean, abundant, reliable, and affordable

Setting the Standard is published by the Building Energy Codes Program of the U.S. Department of Energy Office of Energy Efficiency and Renewable Energy at the Pacific Northwest National Laboratory. Its purpose is to encourage information exchange among building industry professionals and organizations, state and local code officials, and researchers to facilitate timely development and early adoption of the building energy conservation standards. The Building Energy Codes Program would like to continue sending you information about energy codes and compliance tools, but if you would like your name removed from our contacts list, go to www.energycodes.gov/unsubscribe.stm. Send comments and contributions to Loel Kathmann at Pacific Northwest National Laboratory (techsupport@becp.pnl.gov).

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Building Energy Codes Website:
www.energycodes.gov
Tech Support:
www.energycodes.gov/support

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. Working with a wide array of state, community, industry, and university partners, the **U.S. Department of Energy's Office of Energy Efficiency and Renewable Energy** invests in a diverse portfolio of energy technologies.

PNNL-SA-66054