

BUILDING ENERGY CODES PROGRAM



# Enhancing Energy Efficiency Nationwide

## Fiscal Year 2007 Annual Report



U.S. Department of Energy  
**Building Energy Codes**



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

Bringing you a prosperous future where energy  
is clean, abundant, reliable, and affordable

# Saving Taxpayers Money

*Bringing you a prosperous future where energy is clean, abundant, reliable, and affordable.*



## Dear Stakeholders:

It is more important now, than ever in America's history, to increase energy efficiency. Electricity and gas prices are increasing sharply, and rising carbon emissions are affecting our global climate. As the largest consumers of energy in the United States, residential and commercial buildings are heavy contributors to the energy problem, and building codes are a critical part of the energy solution.

When adopted, implemented, and enforced, better building energy codes mean more energy efficient buildings. Constructing a more energy efficient building today makes a difference for as many decades as the building operates in the future. This difference translates into energy cost savings for taxpayers and a smaller carbon footprint for the environment. These results are significant: Since 1991, the U.S. Department of Energy's (DOE) Building Energy Codes Program (BECP) activities are estimated to have saved \$7 billion in energy costs.



DOE is aggressively advocating stronger commercial and residential building energy codes, and we are working closely with key stakeholders, such as the American Society of Heating, Refrigerating and Air-Conditioning Engineers, to this end. In this climate of change toward stronger codes, we are committed to making code compliance easy and seamless for the energy codes community. Per this commitment, BECP provides free software, education, face-to-face and Web-based training, and technical support.

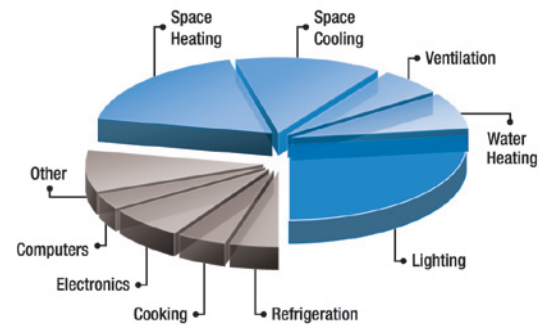
We are proud to share with you our accomplishments of the last fiscal year, working toward increasing the energy efficiency of America's buildings. Every member of the energy codes community makes a difference. Thank you for your continued efforts to support DOE's mission of energy efficiency.

U.S. Department of Energy



**Wall-to-Wall Impact**

Energy codes affect many facets (> 65%) of building energy consumption.



■ = Commercial building categories affected by energy codes

**Moving Forward...**

Read on to learn more about BECP's work to increase energy efficiency in our nation's buildings.

- ✓ Advancing Codes and Standards
- ✓ Supporting States, Supporting People
- ✓ Enabling Code Compliance
- ✓ Training the Building Community

# Advancing Codes and Standards

*American families could save **\$28 million dollars** if homes in Gulf Coast states damaged by Hurricane Katrina were rebuilt using better building energy codes.*

## ECONOMIC BENEFITS

The benefits more stringent building codes bring to taxpayers add up. The Building Energy Codes Program (BCEP) calculated the dollar savings of newer energy codes to Hurricane Katrina-affected states at the request of the Government Accountability Office. By rebuilding Hurricane Katrina-damaged homes per newer energy codes, residential energy costs in Louisiana and Mississippi would be cut by up to \$28 million per year<sup>1</sup>. In addition, by rebuilding Hurricane Katrina-damaged businesses according to newer energy codes, commercial building energy costs in Louisiana and Mississippi would be 7–34% lower<sup>2</sup>.

<sup>1</sup> Lucas RG. 2007. *Analysis of Energy Savings Impacts of New Residential Energy Codes for the Gulf Coast*. PNNL-16265, Pacific Northwest National Laboratory, Richland, Washington.

<sup>2</sup> Halverson MA, K Gowri, and EE Richman. 2006. *Analysis of Energy Savings Impacts of New Commercial Energy Codes for the Gulf Coast*. PNNL-16282, Pacific Northwest National Laboratory, Richland, Washington.

## RESIDENTIAL

The U.S. Department of Energy (DOE) is committed to achieving 30% more energy efficiency in residential buildings. In Fiscal Year 2007 (FY07), BCEP helped develop and submit 16 new proposals for consideration in the 2009 International Energy Conservation Code® (IECC). For example, a proposal to mandate verification of duct sealing by pressure test has the potential to reduce energy consumption by 10% or more relative to the current code. Other proposals add new requirements for basement insulation, increase the stringency of glazing requirements, and clarify existing code provisions. In addition in FY07, BCEP analyzed the 2003 and 2006 IECC to compare their levels of energy efficiency to earlier IECC versions for DOE determinations.



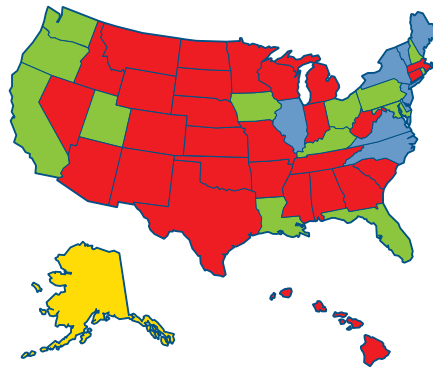
## COMMERCIAL

In FY07, DOE teamed with the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE), building the foundation to achieve 30% savings in new commercial buildings. The first step toward this goal is to modify ANSI/ASHRAE/IESNA<sup>3</sup> Standard 90.1-2010 to be 30% more energy efficient than its 2004 predecessor. Reaching this 30% goal will result in a carbon dioxide savings in the year 2030 equivalent to that emitted by driving nearly 20 million of today's cars for one year.

As part of their work with ASHRAE, in FY07 BECP:

- Started the first of thousands of EnergyPlus simulations, which will be used to set standard requirements

## Code Compliance



- States that **DO NOT** meet or exceed the 2006 IECC or ANSI/ASHRAE/IESNA Standard 90.1-2004
- States that meet or exceed **BOTH** the 2006 IECC and ANSI/ASHRAE/IESNA Standard 90.1-2004
- States that meet or exceed **ONLY** the 2006 IECC
- States that meet or exceed **ONLY** ANSI/ASHRAE/IESNA Standard 90.1-2004

## A Long Road Ahead

At the end of FY07, many states did not meet or exceed the 2006 IECC or ANSI/ASHRAE/IESNA Standard 90.1-2004.

- Began building new lighting cost, opaque envelope cost, and controls databases to help ASHRAE refine its requirements
- Initiated assessments to determine what improvements to ANSI/ASHRAE/IESNA

Standard 90.1 are necessary to achieve the 30% goal.

In addition, in FY07 BECP analyzed ANSI/ASHRAE/IESNA Standard 90.1-2001 and 2004 to compare their levels of energy efficiency to earlier Standard versions for DOE determinations.

<sup>3</sup> The American National Standards Institute/ASHRAE/Illuminating Engineering Society of North America.

# Supporting States, Supporting People

## Making Your Job Easier

*“I look at DOE as a lifeline to building energy code efforts in North Carolina. They are an excellent resource for technical assistance on the codes and software to show compliance with those codes. I truly appreciate the DOE Building Energy Codes Program—it makes my job a lot easier.”*

Billy Hinton  
Code Official

## COMMUNITY CONNECTION

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BECP’s website, [www.energycodes.gov](http://www.energycodes.gov), connects us to the energy codes community, providing free resources to help states and people adopt, implement, and enforce energy codes as well as informative and reliable technical support. Our Resource Center is comprehensive, gathering content not only from BECP archives, but also providing links to energy code resources from around the Web.

With over 40 million hits in FY07 we provided:

- Compliance software: REScheck™ and COMcheck™
- Training
- Code Notes to clarify code issues
- Newsletters and articles
- Code analysis and development information
- Technical support.



## SERVICE TO STATES

BECP provides tailored technical assistance to states upon request and with DOE approval. In FY07, BECP provided technical assistance to Arizona, Illinois, Montana, New York, and West Virginia. Services to these states included software customization per state-specific codes and energy savings estimates that would be realized if states adopted newer residential and commercial codes. In addition, BECP’s annual training event, Energy Codes 2007, provides education geared toward state code officials. Forty states and territories were represented at Energy Codes 2007. Lastly, BECP works closely with the Building Codes Assistance Project—a group that provides much needed energy code advocacy for states.

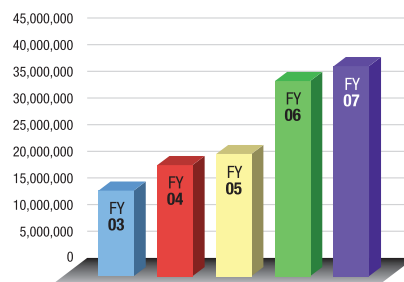
## VALUED EXPERTISE

Our technical support team responds to *every* inquiry voiced by the energy codes community. In FY07, BECP’s Technical Support team responded to almost 4,400 code compliance inquiries from builders, architects, engineers, code officials, homebuyers, and homeowners around the country. The popularity of our technical support indicates a rising need for support in the community; the number of inquiries increased by 7% compared to FY06.

## REACHING OUT

BECP’s newsletter, *Setting the Standard*, achieved a milestone in FY07, reaching over 100,000 subscribers. The total number of subscribers was up by more

Website Hits (by Fiscal Year)



### Website Use Continues to Grow

BECP’s website averaged over 3.3 million hits per month in FY07.

than 15% compared to FY06. Convenient and electronic, *Setting the Standard* is a key tool for information exchange among building industry professionals, state and local code officials, architects, designers, and engineers. Readers learn about late-breaking energy code information, answers to frequently asked questions, software and training information, and more.

# Enabling Code Compliance

## 22,153

*energy codes  
community  
members were  
active, registered  
users of  
REScheck-Web  
and  
COMcheck-Web  
in FY07.*

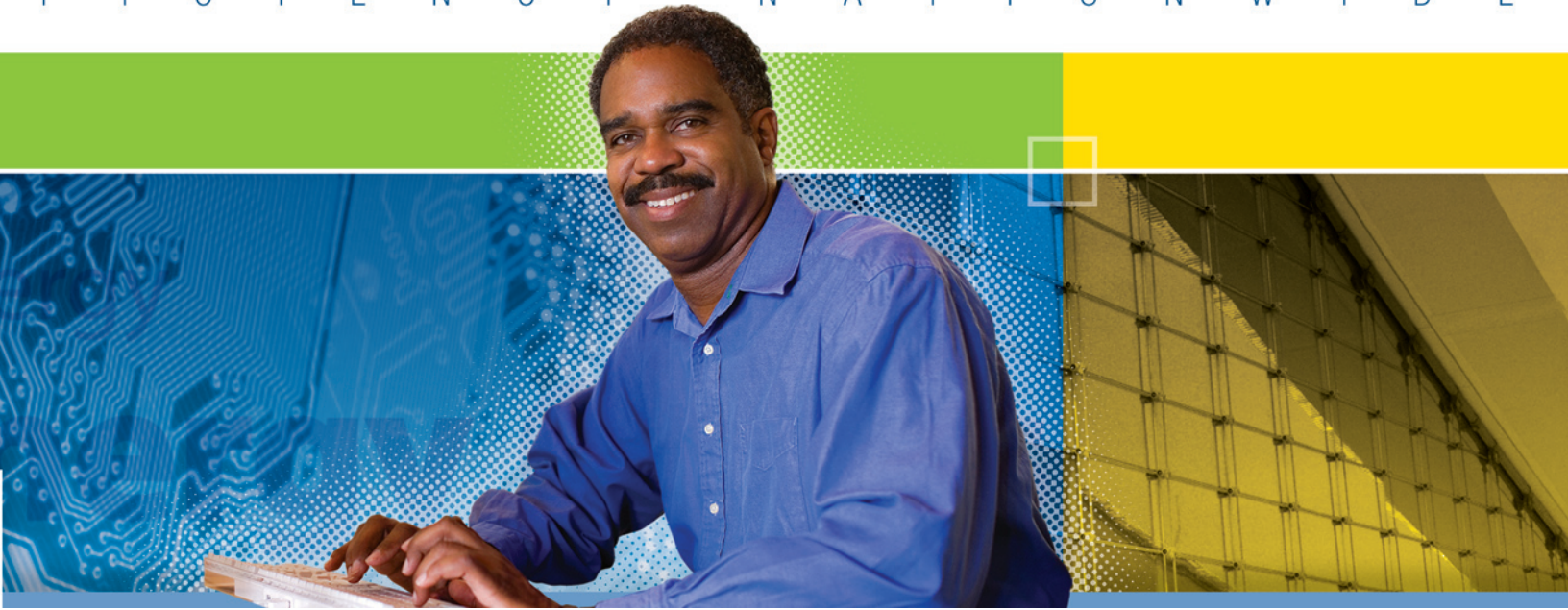


### EASY-TO-USE SOFTWARE

BECP's free compliance software, REScheck and COMcheck, makes complying with energy codes and standards easy for the energy codes community. REScheck and COMcheck are designed for the IECC and ANSI/ASHRAE/IESNA Standard 90.1, which are the basis for most state codes. To accompany the software, we also provide free user guides, videos, training materials, and compliance manuals.

REScheck and COMcheck were downloaded or accessed online hundreds of thousands of times in FY07. Software users benefitted from the software packages' built-in tradeoff approach for demonstrating compliance, which allows a building component exceeding code requirements to compensate for another component that falls short of code requirements.





## SERVING OUR USERS

We continually update our software to meet the needs of the energy codes community.

In FY07, REScheck was upgraded to include:

- The 2006 IECC with limited-scope, whole-building performance
- The 2006 International Residential Code®
- Arizona and New York State codes

In FY07, COMcheck was upgraded to include:

- The 2006 IECC
- Exterior lighting compliance for ANSI/ASHRAE/IESNA Standard 90.1-2004
- Exterior lighting compliance for the 2006 IECC
- Beyond Code Advisor with links to Advanced Energy Design Guides
- Arizona and New York State codes

Most states can use REScheck and COMcheck to demonstrate code compliance. In addition, our software supports many state- and jurisdiction-specific codes.

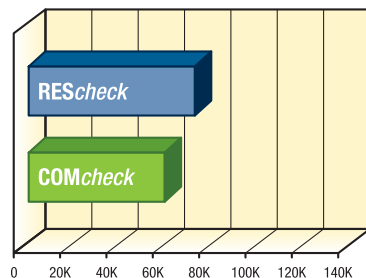
### State/Jurisdiction-Specific Codes Supported by REScheck

- ✓ Arkansas
- ✓ Arizona (Pima County)
- ✓ Georgia
- ✓ Massachusetts
- ✓ Minnesota
- ✓ New Hampshire
- ✓ New Jersey
- ✓ New York
- ✓ Vermont
- ✓ Wisconsin

### State/Jurisdiction-Specific Codes Supported by COMcheck

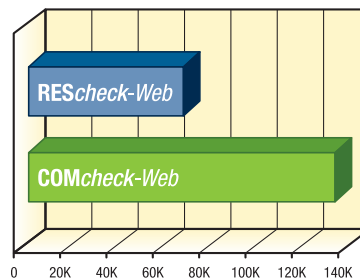
- ✓ Arizona (Pima County)
- ✓ Georgia
- ✓ Massachusetts
- ✓ New Hampshire
- ✓ New York
- ✓ Vermont

### Software Downloads



REScheck desktop and COMcheck desktop were downloaded a total of 130,345 times in FY07, showing a consistent pattern of use compared to FY06.

### Software Web Access



REScheck-Web and COMcheck-Web were accessed a total of 195,920 times in FY07. This indicates a three-fold increase in the use of our Web-based software tools compared to FY06.

# Training the Building Community

## BECP Training Statistics

- 25,084** *educated via self-paced online training and videos*
- 7,600** *webcast participants*
- 6,200** *webcast downloads*
- 250** *received AIA or ICC credit*
- 40** *states and territories represented at Energy Codes 2007*

## ON THE WEB

BECP keeps up with modern training technology to serve the energy codes community. In FY07, training values remained strong compared to the past fiscal year. Over 7,600 builders, architects, engineers, code officials, and others participated in our live webcasts, and more than 6,200 individuals downloaded the recorded webcast videos. This year's webcast topics included REScheck for the 2006 IECC and a three-part series on ANSI/ASHRAE/IESNA Standard 90.1-2004.

25,084 members of the energy codes community were educated through BECP's self-paced online training and videos. The most popular video downloads of 2007 were *How to Use REScheck for Residential Energy Code Compliance* and *Standard 90.1-2004: An Overview of the Lighting and Power Requirements*. Through our online training tools,



250 trainees earned American Institute of Architects/Continuing Education System learning units and International Code Council (ICC) continuing education credits toward ICC renewal certification.

### ON THE ROAD

Every year, the Energy Codes training sessions provide an opportunity to learn about a wide variety of energy codes- and standards-related topics and to network face-to-face through formal and informal meetings. Energy Codes 2007 was held in Pittsburgh, Pennsylvania, in July 2007 and was hosted by the National Energy Technology Laboratory. Attendance remained strong compared to past years, with 235 attendees from 40 states and territories participating in the training event. In addition, 240 individuals

received pre- and post-event training on national energy codes and compliance tools.

At this year’s training session, we offered tours highlighting energy efficient features, such as under-floor heating and cooling system vents as well as placement techniques for air-quality control (i.e., CO<sub>2</sub>) sensors at Carnegie Mellon University. Gray water recycling and exterior lighting techniques as well as extensive daylighting and controls were featured at the nation’s first LEED-certified (Gold) convention center, David L. Lawrence Convention Center.

BECP also attended LIGHTFAIR® International in May 2007. Our session on commercial lighting codes and compliance was attended by more than 75 conference participants, and over 350 people visited the BECP booth.

#### Energy Codes Annual Event

Hundreds of building energy codes community members benefit from our annual training event.

**Unique:**

The only energy codes training of its kind

**Popular:**

About 40 states represented every year

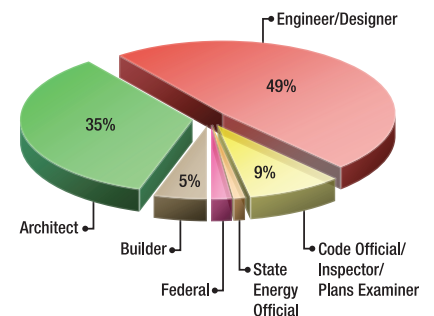
**Positive:**

Success in each state showcased

**Rewarding:**

Awards given for innovation

Webcast Attendance by Profession



#### Web Attendance by Profession

Our webcasts reach a broad spectrum of building energy code professionals.

U.S. Department of Energy

Building Energy Codes Program

The U.S. Department of Energy's Building Energy Codes Program is an information resource on national model energy codes. We work with other government agencies, state and local jurisdictions, national code organizations, and industry to promote stronger building energy codes and help states adopt, implement, and enforce those codes.

[www.energycodes.gov](http://www.energycodes.gov)



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