

Energy Conservation Code Decoded

You won't need your super-secret decoder ring for the 2006 International Energy Conservation Code (IECC), published in January. The new international code is easier to use and easier to enforce. It also closes several loopholes in previous versions. Maintained under the public-consensus process of the International Code Council, the IECC does just what its title implies: promotes the design and construction of energy-efficient homes and commercial buildings. "Homes," in this case, means traditional single-family homes, duplexes, condominiums, and apartment buildings having three or fewer stories. States, counties, and cities have begun reviewing the new code as a potential upgrade to their existing codes. DOE, which played a key role in proposing the changes that resulted in the new code, is offering a free training course that covers the residential provisions of the 2006 IECC.

The 2006 IECC was designed primarily to improve the code's usability and enforceability—energy efficiency was intentionally held nearly constant. That said, DOE tried to make conservative decisions to ensure a slight improvement on average. However, DOE has not yet completed a formal determination on the 2006 IECC, so specific discussion of its efficiency relative to its predecessor is premature. To see if your state or jurisdiction has adopted the 2006 IECC, or to see what current energy code is in effect, visit www.energycodes.gov/implement/state_codes/index.stm. If your jurisdiction has adopted the code, you have two options for complying—a prescriptive method and a performance method.

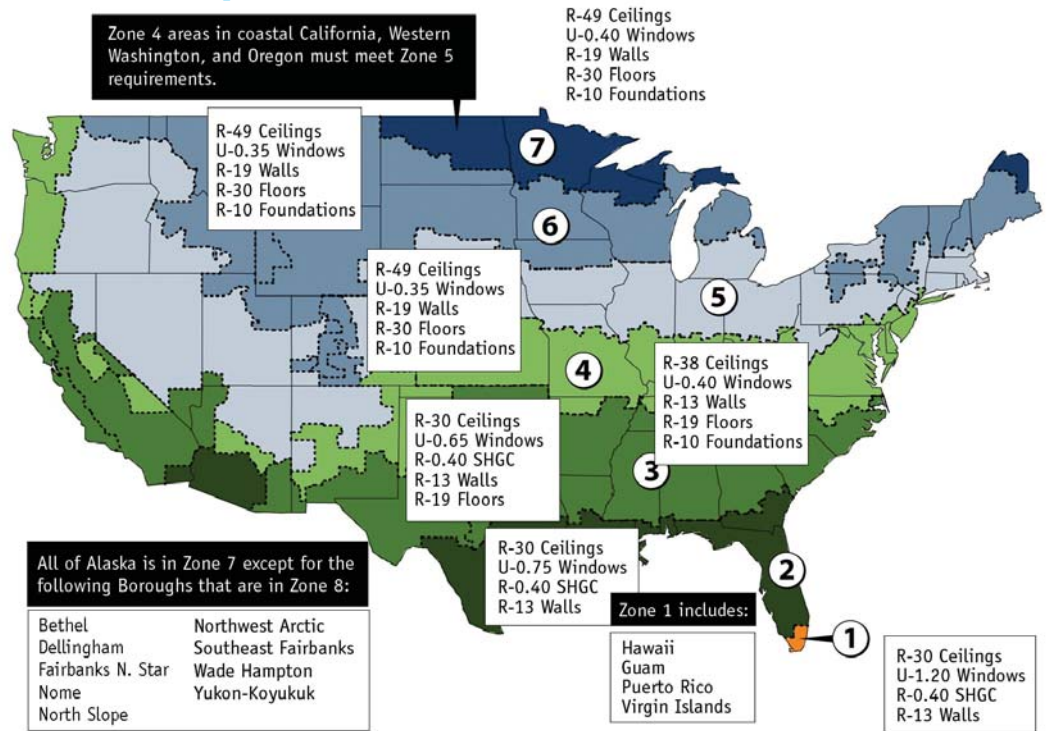
A Completely New Code

The 2006 IECC is completely different from its predecessors. DOE, along with dozens of outside collaborators, designed the new code to make understanding and compliance easier. Com-

geographical zones. These new climate zones form the basis for all climate-dependent requirements, including insulation levels, solar heat gain coefficients, and U-factors for windows and skylights.

The new climate basis has some important benefits. Because the climate

Climate Zone Map



The simplified climate zones defined in the 2006 IECC adhere to county boundaries, making it easier to enforce residential energy efficiency codes.

pared to its immediate predecessor, the 2003 IECC, the new code makes relatively few changes to the overall efficiency of compliant homes. But the format of the new code is markedly simpler. Features that made the older codes difficult for jurisdictions to adopt and enforce have been eliminated or streamlined. Ambiguities have been eliminated; unenforceable provisions have been removed.

Climate Zones Are Simplified

Requirements that vary with climate no longer require users to know the heating degree-days (HDD) for their location to determine the required component efficiencies. The new code replaced HDD-based curves with county-based

dependencies are now based on political boundaries rather than on climate variables, there are considerably fewer zones, making it easier for state-level officials to discern what the code's requirements will be in various counties or other jurisdictions. In prior editions of the IECC, requirements could vary greatly across a state or a county as HDD values varied within its boundaries. The older codes' requirements varied continuously with HDD for some compliance paths and were lumped by HDD ranges in other paths. In the latter case, the code listed 19 climate zones in the United States. The 2006 IECC has reduced that considerably, with residential provisions that vary across only 7 geographical zones. And DOE has made a particular

effort to avoid splitting up major metropolitan areas, even where they straddle county boundaries.

Also, the new climate zones were designed to embody the effects of numerous climate drivers of energy consumption, including cooling degree-days, solar gains, moisture and humidity, and HDD; the older codes varied only by HDD.

Focus on Efficiency, Not Size

Windows can be one of a home's most attractive features, providing views, natural light, and ventilation. Unfortunately, windows can also account for 10%–25% of a home's heating bill. In the United States, residential windows are responsible for approximately 2% of the nation's energy use.

Probably the most prominent difference in the 2006 IECC with regard to windows is that its component efficiencies are independent of the amount of glazing in the home. In earlier editions of the code, wall insulation and glazing U-factor requirements varied with the window-wall ratio of the proposed home. The previous codes allowed homes with lower window-wall ratios to have unreasonably inefficient envelopes, which could result in poor comfort, moisture condensation, and high bills. Previous editions of the code penalized large window-wall ratios by increasing the required efficiencies of walls and window units (and, if compliance trade-offs were employed, other building components). The 2006 IECC ensures efficient envelope components regardless of the window-wall ratio.

In developing the changes that ultimately became the 2006 IECC, DOE recognized that more homes were being built with reduced component efficiencies due to low window-wall ratios than were being built with higher efficiencies to counter high glazing ratios. Also, the linking of component efficiencies to glazing percentages greatly complicated the code and had a number of unintended consequences. For example, larger homes could usually have less insulation than smaller homes because large homes have inherently lower window-wall ratios.

The previous codes penalized many design changes that would reduce energy

consumption. For example, shortening a family room by a few feet makes for a smaller, less energy-consuming house, but it tends to increase the window-wall ratio and therefore requires higher insulation levels under the older codes. Similarly, increasing wall height from 8 to 10 feet makes for a more energy-consuming house, but one with a lower window-wall ratio, and hence lower component efficiency requirements.

By decoupling component efficiencies from glazing percentages, the 2006 IECC ensures that ceilings, walls, floors, and windows are efficient regardless of how much glazing is present. This makes for more cost-effective and comfortable homes in general. In low window-wall ratio homes that would have had reduced component efficiencies, the 2006 IECC reduces the risks of cold spots, moisture condensation and associated mold growth, and other durability problems.


Helping Build Better Homes

To promote affordable and comfortable homes, DOE's Building Energy Codes program offers a training course on Residential Requirements of the 2006 International Energy Conservation Code. The course was first offered in March 2006, when 719 builders, code officials, and others from around the country participated in the 90-minute live Webcast—a 60-minute presentation followed by a live 30-minute question-and-answer session.

Online registration for future Building Energy Codes program events on all aspects of code adoption, implementation, enforcement, and compliance is available at www.energycodes.gov. Webcast videos are made available online approximately two weeks after each event. All Building Energy Codes program Webcasts offer American Institute of Architects (AIA) learning units, and International Code Council members may self-report to receive continuing education units toward certification renewals. Following the Webcasts, participants who want AIA learning units must take an online test. If 80% of the questions are answered correctly, the Building Energy Codes

program submits the participant's information to AIA for credit. All participants may print a certificate of completion using the program's online certificate generator.

DOE has committed to making the latest information about building better homes available to all. If you prefer to have the information delivered to your mailbox, you can sign up at www.energycodes.gov for *Setting the Standard*, the semiannual newsletter of DOE's Building Energy Codes program. In addition, the Building Energy Codes program operates an energy codes help desk that answers several hundred codes-related technical queries per month. Queries can be submitted online at www.energycodes.gov/support/helpdesk.php.

The Building Energy Codes program's compliance and training tools deliver energy savings by helping designers, builders, product manufacturers, and code officials streamline energy code compliance and enforcement. Code compliance software includes REScheck, which applies to single-family and low-rise multifamily dwellings, and COMcheck, which applies to all other buildings. These products are based on the IECC or on ANSI/ASHRAE/IESNA Standard 90.1. The software packages are supported with accompanying user guides, videos, training materials, and compliance manuals at no cost. 

—Pam Cole and Todd Taylor

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FOR MORE INFORMATION:

For more detailed information, visit the International Code Council's Web site at www.iccsafe.org and the DOE Building Energy Codes program Web site at www.energycodes.gov.