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Synopsis of the High Efficiency Commercial Package to the 2012 International Energy Conservation Code

New Buildings Institute (NBI), the American Institute of Architects (AIA) and the U.S. Department of Energy (DOE) are submitting a set of comprehensive and integrated revisions to the commercial chapter of the International Energy Conservation Code (IECC) that would achieve **practical, feasible and necessary** energy use reductions approaching 30% for commercial buildings*.

NBI is a national nonprofit group working to improve the energy performance of commercial buildings. AIA is the voice of the architectural profession and is committed to the goal of reaching carbon neutrality for all buildings by 2030. The U.S. Department of Energy, through its Building Energy Codes Program (BECP), is focused on increasing the energy efficiency of buildings on behalf of the public and our national interests in collaboration with key partners and stakeholders.

The group's IECC proposal is significantly based on NBI's *Core Performance Guide,* which was originally published in October 2007. Codification and revisions led to its adoption as the Stretch Code in Massachusetts (BBRS 120aa – 2009). One key area for supplementing the Core Performance protocol was ongoing efforts of DOE to support increased usability of the IECC and improve the energy saving potential of the code as it relates to commercial buildings. DOE has been actively engaged in the enhancement to ASHRAE Standard 90.1 and has incorporated some of that research into the IECC proposal. The main NBI/AIA/DOE proposal, EC 147, was approved "As Submitted" in October 2009 by the ICC's IECC Code Development Committee.

Two additional proposals, EC 157 and EC 165, proposed by NBI and AIA, offer complementary opaque envelope and fenestration specifications, respectively, and were also approved "As Submitted" by the committee.

An alternative set of opaque envelope tables was proposed by DOE in EC-158, but it was not approved by the committee. EC-173, a U.S. DOE proposal to require minimum daylighting areas in "big box" type buildings, was approved.

ADDITIONAL MATERIAL

Additional information on the proposals and the IECC hearings is available at **www.newbuildings.org/comprehensive-iecc-proposal**. Further information on the DOE BECP and supporting rationale for the DOE contributions to this proposal are available at **www.energycodes.gov**.

THE PROPOSALS

These 2012 IECC proposals substantially revise Chapter 5 of the IECC with a series of measures and market-proven technologies that are integrated to achieve significant energy savings over the current national model code. The proposals build on and update the provisions of the 2009 IECC applicable to commercial buildings, plus introduce some new elements such as cool roofs, commissioning of critical building service systems and a section on "additional efficiency package options" to offer flexibility in achieving these significant savings.

THE COMMENT PROCESS

An open, collaborative stakeholder process was undertaken since the code development hearings in Baltimore last fall. Numerous comments from parties representing industry and product groups, enforcement agencies and the building and design industry helped to provide consensus agreements on several issues raised during testimony, clarified code language, increased readability and strengthened the proposals.

*Savings estimates are based on NBI analysis.

KEY ELEMENTS

Key elements of the proposals as modified by the Public Comments are:

- **GENERAL.** Clarifies a number of issues associated with the current code such as the scope of the chapter and definition of key terms. The revised stringencies in all of the lighting, envelope and mechanical tables reflect product availability and lengthy consultation with numerous stakeholders.
- **BUILDING ENVELOPE.** Comprehensive air barrier language is adapted from the Massachusetts building code. The change also enhances and clarifies the provisions in the code and strengthens the efficiency potential of the code by addressing issues such as cool roofs, and reducing the amount of infiltration allowed through non-opaque components of the building envelope such as vents and dampers.
- **MECHANICAL SYSTEMS.** Improves sections regarding *economizers,* incorporates more use of *demand-controlled ventilation,* includes efficiency improvements in mechanical equipment with some climate-specific flexibility and provides additional calculation procedures for determining loads and equipment sizing.
- **QUALITY ASSURANCE.** Incorporates *testing and acceptance requirements* of mechanical systems and performance testing of lighting controls. Both the HVAC acceptance requirements language drawn from the Washington State energy code and the new lighting systems language will ensure greater building performance. A threshold level of mechanical equipment capacity ensures that acceptance requirements will serve those larger systems where energy and cost savings are greatest. The acceptance requirements language is proposed to be included in a new Section 508 of the IECC.
- **LIGHTING.** Reduces energy needed for lighting based on more efficient illuminating equipment and the use of several lighting control strategies. The *revised LPDs* and lighting control criteria are derived from recent addenda to ASHRAE 90.1, consultations with the International Association of Lighting Designers, and the *Core Performance Guide.*
- **DAYLIGHTING.** Includes additional availability of daylight sources combined with *automatic daylight controls,* and comprehensive control strategy for all lighting zones. Daylighting can be a major energy-efficiency asset provided electric lighting is reduced when daylight is available. The daylighting options in EC 165 for the 40% WWR and the 5% skylight area were written in response to broad stakeholder feedback on both glazing issues and daylighting issues
- **ADVANCED EFFICIENCY PACKAGE OPTIONS.** A new Section 506 contains three approximately energy-equivalent packages. These options round out the final 3% in energy savings in the proposal, while also offering important flexibility in striving to approach 30% overall energy savings. These package options include:
  - » Additional HVAC equipment efficiency using tables derived from the Consortium for Energy Efficiency recommendations (CEE is a North American collaborative effort of utilities, environmental groups and industry).
  - » A focus on further reducing lighting power density with tables calculated using available *high-efficacy illuminating products* reflected in the ASHRAE/IESNA consensus for 90.1-2010, with daylighting alternatives provided in some building types
  - » A package that includes onsite *renewable energy generation.*

HIGH EFFICIENCY COMMERCIAL PACKAGE FOR 2012 IECC

EC-147: Comprehensive Chapter 5 Revisions (NBI/AIA/DOE)
EC-157: Opaque Envelope Tables (NBI/AIA)
EC-165: Fenestration Tables (NBI/AIA)

OTHER NOTABLE HIGH-EFFICIENCY PROPOSALS:

EC-158: Alternative Opaque Envelope Tables (DOE)
EC-173: Daylighting (DOE)

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