

Advanced Building Energy Codes

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CONGRESS SHOULD

- Enact energy efficiency improvement targets for building energy codes such as those included in pending Federal legislation. Advanced residential and commercial model energy codes can achieve cost-effective efficiency improvements of a 50% reduction in energy intensity by 2016/2018, when compared to a 2004/2006 baseline energy code.
- Authorize and appropriate adequate funding and technical assistance to states and local governments for energy code compliance and enforcement.
- Allow higher minimum equipment efficiency requirements in building codes (i.e., levels exceeding federal equipment efficiency standards) provided the code offers an explicit pathway for meeting code levels with equipment just meeting federal minimums (e.g., by including other efficiency measures to make up for the lower efficiency equipment).

THE ISSUE

In order to meet long-term US energy goals, it is important that new buildings be as energy-efficient as is economically justified, since it will be much more expensive to retrofit these buildings after they are completed. ACEEE supports adoption and implementation of energy-efficient building codes at the state, local, and federal levels.

SUMMARY

Advanced building energy codes are a cost-effective way to help consumers save energy and money, make new housing and commercial buildings more affordable, improve comfort, and reduce air pollution. All of these benefits are difficult or impossible to capture if not taken into consideration at the time of construction. There are additional benefits: codes increase the reliability of utility systems, mitigate harmful environmental conditions such as ground-level ozone and climate change, and boost job creation nationwide.¹

Buildings use 74% of electricity, and 41% of the total energy use in the United States. They are also responsible for 40% of U.S. CO₂ emissions.² Since buildings have long lifetimes and retrofits can be costly, it is crucial to incorporate energy saving measures during construction in order to achieve acceptable efficiency and comfort. Building energy codes, which are written legal requirements directing design and construction of buildings, establish the minimum level of energy efficiency for residential and commercial buildings. They improve efficiency by mandating performance, achievable through careful construction and proper selection of building components, including wall and ceiling insulation, window and door specifications, heating, ventilation and air conditioning (HVAC), equipment and system efficiency, and lighting power density and controls.

Most states use a version of the International Energy Conservation Code (IECC) for their residential building code, which requires a minimum level of energy efficiency in new residential construction. Most commercial building codes are based on ASHRAE 90.1, jointly developed by the American Society of Heating, Refrigerating

¹ More Jobs and Greater Total Wage Income: The Economic Benefits of an Efficiency-Led Clean Energy Strategy to Meet Growing Electricity Needs in Michigan <http://aceee.org/pubs/e07x.htm>

² The 2013 State Energy Efficiency Scorecard: <http://www.aceee.org/research-report/e13k>

and Air Conditioning (ASHRAE) and the Illuminating Engineering Society (IES). The IECC also includes prescriptive and performance commercial building provisions.³

Model code organizations are in the process of updating building codes to achieve higher levels of cost-effective energy savings. The International Energy Codes Council adopted changes to residential building codes for the 2012 IECC that provide 30% more efficiency than the 2006 edition. Those efficiency levels were maintained for the 2015 IECC while a new energy performance index, similar to national home energy rating systems (HERS), was added to yield higher energy efficiency levels for this new whole building compliance method. The American Society of Heating Refrigerating and Air-Conditioning Engineers (ASHRAE) has achieved a 30% savings target for the 2010 update of their model commercial building code, and expanded the energy savings in the 2013 edition. The ASHRAE 90.1-2016 version is working towards a 45% whole building energy use reduction compared to the 2004 baseline code. As new codes are finalized, states are directed to either adopt these model codes or their own state-specific equivalents. Funding and technical assistance to states is authorized.

ACEEE estimates that in 2030, the above-mentioned building code provisions would save 1.35 quads of energy (including 94 billion kWh of electricity and 404 trillion Btu of natural gas), with carbon dioxide emissions reductions totaling approximately 72 million metric tons in 2030. The policy would also yield significant economic benefits including net energy bill savings for customers of \$13.05 billion in 2030.

In addition, Congress should consider provisions to allow higher minimum equipment efficiency requirements in building codes (i.e., levels exceeding federal equipment efficiency standards) provided the code offers an explicit pathway for meeting code levels with equipment just meeting federal minimums (e.g., by including other efficiency measures to make up for the lower efficiency equipment). Such a provision is contained in a recent agreement between ACEEE, other energy efficiency advocates, and AHRI, the trade association for heating and air-conditioning equipment manufacturers.⁴

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³ *Ibid.*

⁴ <http://aceee.org/press/0910ahri.htm>