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Comments in support of energy conservation building codes
Energy Development and Transmission Interim Committee
August 5, 2008

Dakota Resource Council believes that the state needs to be more proactive regarding energy efficiency and conservation measures.

During the energy crunch of the 1980s, there was a rush to turn down thermostats, reduce speed limits and look to renewable energy sources. Today, however, now it seems we are merely looking at ways to feed our growing need for energy.

Energy efficiency is truly the "low-hanging fruit" in our quest to save energy and reduce our overall carbon footprint. Efficiency can delay the need to build costly new sources of energy. With rising fuel costs, everyone can save money through greater efficiency measures.

In North Dakota, where we have very cold weather in the winter and very hot weather in the summer, it is unfortunate that our commercial building codes have lagged behind federal standards. And with no requirement to meet residential energy codes, homes will very likely be constructed with inadequate insulation and less efficient heating and cooling systems.

People come and go, but commercial buildings and homes remain a constant for many years. Therefore, it is imperative that they be as efficient as possible to reduce energy use and costs for North Dakota residents as both taxpayers and consumers.

Dakota Resource Council strongly encourages the Committee to implement strong residential and commercial energy efficiency building codes.

We also respectfully ask the Committee to consider ways that the state can fund weatherization projects for existing homes for lower-income families and individuals who do not fall within the current low-income parameters for assistance. Without such assistance many people of low and moderate income simply cannot afford the initial investment costs of home weatherization projects. We hope the Committee will recommend that a portion of the Resources Trust Fund be used for this purpose.

Thank you for your consideration.

Marie Hoff, Bismarck
Dakota Resource Council Clean Electricity Task Force

over them item-by-item. I would, however, like to emphasize that the payback period on upfront costs is typically short. As the handout indicates, a Nevada study estimated that upgrading the energy efficiency of commercial buildings to comply with the code would cost about $1.68 per square foot, but would result in energy bill savings of $68¢ per square foot per year. This results in a simple payback of about 2.4 years – a very attractive investment by almost anyone's standards. A study in Phoenix showed a slightly longer average payback of 3.9 years for the residential sector, but also determined there was a net lifecycle cost savings to the homeowner of over $11,000.

I have one final comment on code economics before moving on. The handout correctly notes that even though the upfront cost of code compliance can typically be recouped in a short period of time, the savings do not always go to the entity paying the initial compliance cost. This occurs when the developer or builder incurs the higher costs but the savings are repaid over time to the building owner or occupants. This can obviously reduce the motivation of the party paying the costs to pursue code compliance.

If you will turn to page three of your handout, you will see two maps of the United States. These show the status of energy code adoption within the country. The top is for the commercial sector, and the bottom is residential. In either case, those states colored blue, green and yellow comply with federal law while the red and gray states do not. As you can see, North Dakota currently falls into the latter category. I'll talk more about that in just a moment.

The remainder of the handout contains some interesting supplemental information that I'd encourage you to read at your convenience. In the interest of time, however, I'd like to now address the specific bill draft relating to the North Dakota Energy Code which is currently under consideration by this committee.

As you know, this bill draft originated from the EmPower North Dakota Commission. In the course of their efforts to develop a comprehensive state energy policy, the Commission received information which led them to include these statements:

Goal: Increase energy efficiency in North Dakota through education and promotion of energy savings best practices and programs.
Policy: Initiate state policies that encourage and increase energy efficiency.

One of the action items under this policy is:

Develop a state energy building code.

North Dakota does have an existing energy code, but it is based on a 1993 model code which is very outdated. With the exception of state government buildings and schools, it is also not mandatory unless adopted by local jurisdictions which, to the best of our knowledge, has never happened. Finally, as I mentioned earlier, our code is not in compliance with federal law and regulations as set forth in the Energy Policy and Conservation Act of 1992. This issue is discussed in the sidebar box on page four of your handout.

The proposed bill draft would accomplish two objectives. The proposed revisions to 54-21.2-03 would update the referenced model code to the most current nationally accepted version. The changes to 54-21.2-04 would make this model code, along with any adopted rules and amendments, mandatory statewide. The rules and amendments would be periodically reviewed and updated by a representative group of stakeholders in a manner similar to that currently used with the State Building Code.

The primary benefit associated with these revisions to the state energy code is to ensure that new and remodeled buildings are constructed to standards of energy efficiency which have been determined by broad consensus to be economically justified. This benefits the citizens of North Dakota by not only reducing their direct energy costs, but also by minimizing those energy costs that they pay indirectly through rent, product & service purchases, and taxes. This is especially important now, as we once again appear to be on the brink of a major increase in energy prices. A state energy code benefits building owners by protecting them from high operating costs caused by excessive energy usage; thereby maximizing their return on investment. It also protects the architects, engineers and contractors by providing them with clear guidance on minimum building design requirements, reducing the risk that their professional judgment would be subject to hindsight legal challenges. Finally, but certainly not least importantly, it would bring North Dakota into compliance with mandatory federal law.

One issue associated with making these changes is the need to train stakeholders on the new requirements and how to comply with them. Our office stands ready to provide this training. We propose to accomplish this by conducting a series of workshops across the state, staffed by experienced trainers, and paid for using special funds from our federal petroleum violation escrow accounts or from dedicated federal grants which may be available for this purpose.

In summary, this bill draft to revise the current state energy code and provide a process for periodically updating it has significant benefits for many different stakeholder groups and will allow North Dakota to comply with federal law with no incremental fiscal expense to the state.

Are there any questions I can answer on this item?

The second bill draft I'd like to comment on today would require the division of community services of the department of commerce to adopt rules for construction standards for public buildings that are consistent with or exceed the silver building rating of the leadership in energy and environmental design, commonly referred to as LEED, rating system for new commercial construction and major renovation projects. These rules would apply to any new construction in excess of five million dollars or modification of an existing structure in excess of two million dollars. The division would be required to provide an exemption from these standards for any project where a written analysis is provided that proves the cost of compliance significantly outweighs the benefits.

To put all this in perspective, I'd like to refer back to my previous discussion. The energy code being proposed is a minimum standard, developed by broad consensus, which nearly everyone agrees is cost effective and in the best interest of society. The federal government and most

states have, therefore, made it mandatory for all buildings except those specifically exempt due to unusual conditions, such as manufacturing facilities.

The next step up the efficiency ladder is a federal program known as Energy Star. In order for a facility to qualify as an Energy Star commercial building, it must be in the lowest 25th percentile of energy use for similar buildings nationwide, after adjusting for climate. Residential energy star homes must meet similar high standards. This is the standard we currently encourage for new state facilities. Attaining this rating generally requires careful design and the utilization of very energy efficient equipment and construction practices. It too, however, is also considered to be cost-effective.

The LEED ratings go far beyond energy codes and Energy Star. Their focus is on producing buildings with enhanced sustainability. Sustainability, in this context, means constructing facilities which minimize the use of non-renewable resources. In addition to reduced energy use, the LEED ratings include items such as minimizing water consumption for plumbing fixtures and irrigation, using recycled materials for construction, and even including bike racks and shower rooms in order to encourage employees to bike to work rather than driving there. In my handout, I have included a checklist of items qualifying for credit under the LEED system.

The broader goal of the LEED program comes at a cost. This cost can be broken down into two components. First, there is the "hard" cost of the building construction. Recycled building materials, ultra low-flow plumbing fixtures and shower rooms in office buildings often produce a significant incremental cost compared to standard construction practices. The amount of incremental cost can vary widely, depending upon factors such as the skill of the design team, the type of facility and its location. A study in 2004 by the General Services Administration, or GSA, found that for one type of building, in various locations across the United States, the incremental hard costs of obtaining a LEED silver rating ranged from $0 – $9.57 per gross square foot of building area. I should note, however, that the GSA already mandates some sustainability measures in their standard construction practices, so the incremental hard cost to North Dakota would likely be somewhat higher.

In addition to these hard costs, there are also incremental soft costs associated with extra design and documentation requirements. The design portion is to ensure the plans and specifications meet the LEED standards. The documentation is to prove that is does. The Green Building Council, which administers the LEED program, requires detailed and extensive documentation to prove compliance before issuing their rating. These soft costs will also vary from building to building, but the GSA study found them to range from 41¢ to 55¢ per gross square foot.

One important point to keep in mind is that since LEED's primary purpose is to promote sustainability it does not necessarily produce operating cost savings to justify its use in the same way that energy codes and the Energy Star program do. In fact some of the measures, like those to promote the use of recycled materials, may actually increase cost and energy use with no corresponding tangible benefit.

In summary, this bill draft has the noble objective of improving state building sustainability. It's important to keep in mind however, that unlike the energy code measure discussed earlier,

making this mandatory will not necessarily produce hard dollar savings to offset the additional costs. The question of whether or not to adopt it becomes, therefore, much more of a public policy issue than one related to economics.

In addition, if the Committee decides to move this bill draft forward, I request that they provide additional guidance regarding the circumstances under which they feel an exemption from the standard should be granted. As I mentioned earlier, the bill draft includes the statement, "The division must provide for an exemption from these construction standards for any public improvement for which a written analysis is provided that proves that the cost of compliance significantly outweighs the benefits". This statement raises several questions. Are the benefits to be considered only the hard dollar operating cost savings, or do they also include intangible items? Also, what does the phrase "significantly outweighs" mean in quantitative terms? Finally, who is eligible to prepare and submit the written analysis? Is it restricted to certain registered or certified design professionals, or could it be provided by anyone? These ambiguities could create serious difficulty in program administration, and are best addressed up-front.

I thank you for the opportunity to provide these comments, and even though I am not a LEED expert, I'd be happy to try to answer any questions you may have.

Building Codes for Energy Efficiency

This fact sheet highlights the benefits of building energy codes and describes several steps that parties working under the National Action Plan for Energy Efficiency can take to advance cost-effective energy efficiency through the adoption, implementation, and enforcement of codes.

Overview

Parties working to create a sustainable, aggressive national commitment to energy efficiency under the National Action Plan for Energy Efficiency are exploring the opportunities for increased energy efficiency through new or improved building energy codes. Energy codes require new and existing buildings undergoing major renovations to meet a set of minimum requirements for energy efficiency. For parties pursuing energy efficiency as a cost-effective resource, codes can be a critical piece of a comprehensive approach.

Energy consumption in buildings accounts for one-third of all the energy used in the United States and two-thirds of the total electricity demand. To address this demand, building codes have been used for nearly three decades and are a cost-effective strategy to overcome barriers to energy efficiency in buildings. In combination with appliance standards, energy codes that are well-designed, implemented, and enforced can lock in cost-effective energy savings of 30 to 40 percent at the time of building construction compared to standard practices.[1] In addition to lowering energy bills, energy codes can reduce load growth and the need for new energy generation capacity while limiting air pollution and greenhouse gas emissions. Recognizing these benefits, a majority of states have adopted building energy codes in some form for residential and commercial construction (DOE, 2006).

About Building Energy Codes

Energy codes typically specify requirements for "thermal resistance" in the building shell and windows, minimum air leakage, and minimum efficiency for heating and cooling equipment. These measures can help eliminate inefficient construction practices and technologies with only modest increases in up-front project costs.

New construction and major renovation represent cost-effective times to incorporate energy-efficiency measures into buildings because these improvements save energy throughout the life of those buildings and can be expensive to adopt later.

Building energy codes are typically developed at the national level, adopted at the state level, and implemented and enforced by local governments.

Benefits of Building Energy Codes

Building energy codes provide states and municipalities across the country a range of energy, environmental, and economic benefits. Highlights from several jurisdictions are summarized below and in Table 1.

Energy

Energy benefits of building codes include saving on energy bills, reducing peak energy demand, and improving system reliability. For example, California's building standards have helped save businesses and residents more than $15.8 billion in electricity and natural gas costs since 1975, and these savings are

expected to climb to $59 billion by 2011 (CEC, 2003). When fully implemented, the state's new 2005 building efficiency standards are expected to yield peak energy use reductions of 180 megawatts (MW) annually—enough electricity to power 180,000 average-sized California homes (Motamedi et al., 2004).

According to the U.S. Department of Energy (DOE), if all states adopted and fully implemented American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE) Standard 90.1-1999, a model energy code for commercial buildings, then building owners and tenants would lower their utility bills by $110 million the first year and save $5.7 billion over 10 years. The country would save 16 trillion British thermal units (Btu) of energy that first year and almost 800 trillion Btu cumulatively over 10 years. The magnitude of each state's savings depends on many factors: the efficiency of its current building practices; the stringency of the code it adopts; its population, climate, and building construction activity; and the effectiveness of code training and enforcement (DOE, 2007).

Environment

States and municipalities are also finding that energy codes can improve the environment by reducing air pollution and greenhouse gases. For example, the New York Energy Conservation Construction Code is estimated to reduce carbon dioxide (CO_2) emissions by more than 500,000 tons annually and sulfur dioxide (SO_2) by nearly 500 tons per year (DOE, 2002). Similarly, the 2001 Texas Building Energy Performance Standards are projected to reduce nitrogen oxide (NO_X) emissions statewide by more than 2 tons each "peak" day and more than 1 ton each average day, which helps the state meet Clean Air Act requirements for non-attainment areas (Haberl et al., 2003).

Economics

Building energy codes can also help grow the economy. States and municipalities benefit from greater investment in energy-efficient capital equipment and new jobs installing equipment and monitoring building compliance. While spending on energy services typically sends money out of state, dollars saved from efficiency tend to be re-spent locally (Kushler et al., 2005; Weitz 2005a). Codes become even more cost-effective during periods of high heating and cooling fuel prices.

At the building level, the "payback period" on any increase in upfront costs is typically short. A Nevada study estimated that upgrading the energy efficiency of commercial buildings to comply with the code would cost about $1.60 per square foot but would result in $0.68 per square foot of energy bill savings per year, meaning a simple payback of about 2.4 years (Geller et al., 2005). Similarly, it is estimated that

Table 1. Benefits of Building Energy Codes

Jurisdiction	Building Energy Code	Projected Energy and/or Demand Savings	Other Information	Reference
California	2005 Title 24 Building Efficiency Standards for residential and commercial construction	180 MW reduction in annual energy demand (equivalent to the electricity requirements of 180,000 average-sized California homes)	$43 billion in electricity and natural gas savings by 2011	www.energy.ca.gov/title24/
Phoenix, Arizona	2004 IECC Supplement for residential construction	18 percent reduction in residential energy consumption; 21 percent reduction in electricity use; 10 percent decrease in natural gas use	Increase in upfront cost is $1,517; payback period is 3.9 years (based on simple payback); life-cycle cost savings is $11,228 per home	www.epa.gov/cleanenergy/pdf/gta/guide_action_chap4_s3.pdf
Texas	2001 IECC for residential and commercial construction, including a solar heat gain standard for windows	1.8 billion kilowatt-hour savings over 20 years; 1,220 MW of peak demand avoided	Code is approved for 0.5 tons per day of NO_x emissions credits in its state plan for improving ozone pollution	www.seco.cpa.state.tx.us/sa_codes.html
All 50 States	2006 IECC for residential and commercial construction	Savings potential if all states adopted IECC is 6.6 quadrillion BTUs over 20 years	Would reduce more than 100 million metric tons of carbon equivalent emissions	www.bcap-energy.org/

while a new home built to the International Energy Conservation Code (IECC) in Phoenix, Arizona, will cost an average of $1,517 more than a home built without the code, the difference will be repaid to homebuyers in 3.9 years (based on simple payback). The life-cycle cost savings associated with improved energy efficiency from adopting the IECC is $11,228 per home (Kinney et. al., 2003).

While the upfront costs of code compliance can be recouped over short payback periods, the savings do not always accrue to the entity paying the initial compliance costs. This "split incentive" occurs when a developer or builder sees higher costs that are repaid over time to the building owner or occupants.

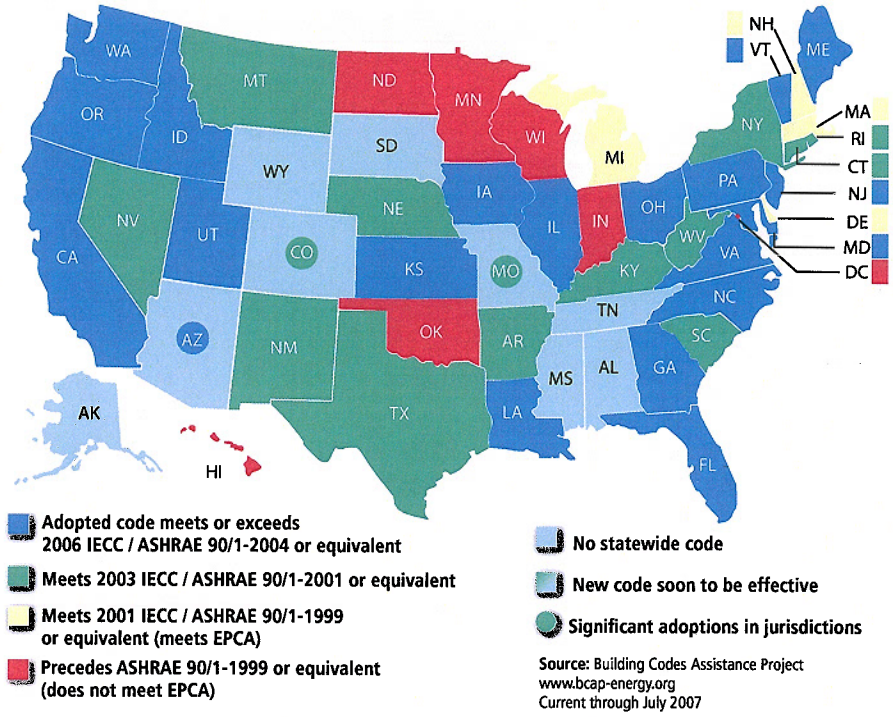
State, Local, and Utility Action

The status of state adoption of residential and commercial codes is provided below in Figures 1 and 2.

State Codes: Residential Sector

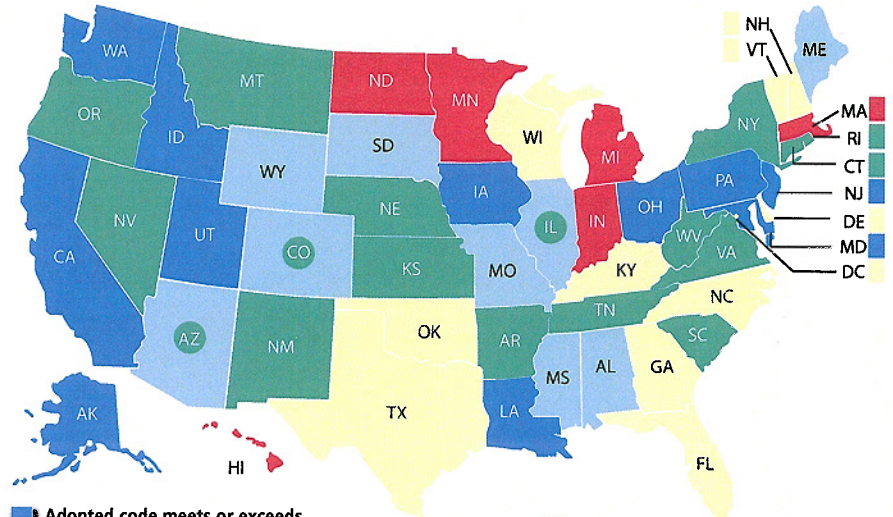
In 1978, California became the first state to include energy requirements in its code. Today, 40 states and the District of Columbia use a version of the Model Energy Code (MEC) or IECC model energy code, or their own equal-or-better code for residential buildings. Eleven of these 40 states are using the most stringent version of the IECC approved by DOE. While nine states have not adopted a statewide code, several large municipalities within three of these states have adopted the 2003 IECC (BCAP, 2007a).

Figure 1: Status of Commercial State Energy Codes



Source: Building Codes Assistance Project
www.bcap-energy.org
Current through July 2007

Figure 2: Status of Residential State Energy Codes



Source: Building Codes Assistance Project
www.bcap-energy.org
Current through July 2007

State Codes: Commercial Sector

A total of 40 states and the District of Columbia use a version of the ASHRAE or IECC model energy code for commercial buildings. Of these, 19 states are using the most recent code that DOE has approved. Nine states have not adopted a commercial building code, although several large municipalities within three of these states have adopted the 2003 or 2006 IECC.

Local Codes

In states with "home rule" laws (in which municipalities are granted greater self-government), local officials can adopt their own codes. For example, two Arizona cities—Phoenix and Tucson—are taking this approach and thereby affecting a large portion of the state's overall building stock. Alternatively, home rule states can revise existing law to allow for statewide building energy codes. Texas followed this approach, primarily in an effort to improve the state's air quality.

Utility Actions

Utilities can play several roles in support of building energy codes. One key role is partnering with states and localities during code adoption or modification to fill information gaps, provide analytic support, and engage stakeholders. Utilities can help educate the building and enforcement communities about specific requirements contained in new codes.

Model Building Energy Codes

States have adopted a wide array of commercial and residential model energy codes across the country. The energy code that applies to most residential buildings is the International Energy Conservation Code (IECC), which supersedes the Model Energy Code (MEC). The federal Energy Policy and Conservation Act (EPCA) of 1992 requires states to review and adopt the MEC (and its successor, the IECC), or submit to the Secretary of Energy its reasons for not doing so.

Most commercial building energy codes are based on ASHRAE/IESNA Standard 90.1, jointly developed by ASHRAE and the Illuminating Engineering Society (IES). EPCA requires states to adopt the most recent version of ASHRAE Standard 90.1 that the U.S. Department of Energy (DOE) has determined will save energy, currently 90.1-1999. Alternatively, states can follow the commercial building provisions of the IECC.

Role for Utilities

Support effective implementation of codes:

- Educate stakeholders about key provisions, incentives, and compliance options.
- Partner with jurisdictions to sponsor code compliance training.
- Provide technical assistance to builders, contractors, architects, and code officials.

Integrate codes into resource planning:

- Explicitly account for codes in base case load forecast of long-term resource planning.
- Support efforts to gather and analyze data.

Advocate for adoption of stronger codes:

- Work proactively with state and local code jurisdictions.
- Provide analysis to support stronger code adoption.
- Propose code amendments that further strengthen provisions for reduced peak demand.

For example, electric and gas utilities in Washington state spearheaded a Utility Code Group (UCG) in the mid-1990s to inform stakeholders about key code provisions, incentives, and compliance options. UCG developed a training program and disseminated information to industry audiences through an initiative to advance innovative enforcement and evaluation mechanisms. This precedent laid the groundwork for subsequent success—a recent construction practice survey found that 94 percent of homes in Washington met or exceeded code requirements for the building envelope (Ecotope, 2001).

Another important role for utilities is to integrate codes into the resource planning process. As utilities develop long-term plans, they can explicitly modify their base case load forecast to account for codes and standards, along with the impacts of ratepayer-funded energy efficiency programs. This is accomplished by forecasting the impacts of a new national or state building code, then making assumptions about compliance, and finally applying it to estimates of new construction. The Northwest Power and Conservation Council and the California Energy Commission (CEC) both incorporate these savings into their planning process.

An additional role for utilities is to strengthen existing model codes. In California, utilities have long partnered with state officials to support the improvement of the pioneering Title 24 building standards. For their efforts, California utilities receive credit on shareholder incentives for building standard enhancements that they propose and that are adopted by the CEC. The resulting savings count toward their energy efficiency targets and are incorporated into overall forecasts of energy and demand savings.

Opportunities for Additional Energy Savings With Building Codes

While substantial progress has been made, state and local governments can continue to incorporate new technologies and features into their codes (Prindle et al., 2003; BCAP, 2007b; Weitz 2005b). The American Council for an Energy-Efficient Economy (ACEEE) estimates that upgrading residential building codes could save an "average" state about $650 million in homeowner energy bills over a 30-year period (Prindle et al., 2003). With energy consumption expected to rise 20 percent in the residential sector and 19 percent in the commercial sector by 2020, the potential energy savings from further building code improvements can be significant.

For states that have building codes but are interested in achieving additional cost-effective energy efficiency, the following best practices are recommended:

- *Update building energy codes* to ensure that recent technological and design improvements are captured.
- *Establish monitoring, evaluation, and enforcement procedures* to improve the effectiveness of existing codes.
- *Engage key stakeholders,* including local building officials, homebuilders, utilities, building supply companies, and contractors for insulation, heating, and cooling equipment.
- *Hold regular education and training sessions* for homebuilders and building officials before and after the effective date of the new energy code requirements.

Steps to Achieve Energy Savings Through Building Codes

- Adopt building codes that capture the cost-effective savings as technologies advance and reflect the state's prevailing climate conditions.
- Train homebuilders and building officials.
- Establish monitoring, evaluation, and enforcement procedures.
- Consider pursuing "beyond code" building programs, such as ENERGY STAR.
- Leverage other energy efficiency funding sources.
- Take advantage of DOE technical and grant assistance.

Source: EPA, 2006

- *Consider pursuing "beyond code" building programs,* such as ENERGY STAR®,that achieve additional cost-effective energy efficiency.
- *Leverage other clean energy funding sources* to support building energy codes. For example, New York and Wisconsin are using public benefits funds to support implementation and enforcement. California is using utility resource procurement dollars to advance its code.
- *Take advantage of DOE technical and grant assistance* to states to facilitate building code adoption and implementation.

For states without energy codes, a typical starting point is to hold stakeholder discussions and launch formal studies to determine whether codes make sense in their area. Adopting a consensus-driven approach can minimize legal disputes and avoid delays in code implementation.

For jurisdictions with unique circumstances not addressed by model codes, it may make sense to add or remove certain code provisions that are not cost-effective or otherwise appropriate for local circumstances. In all cases, successful energy code programs require sufficient budget and staff resources to involve stakeholders, support implementation, and evaluate progress.

Stakeholders can go beyond codes and lock in even greater energy savings through advanced appliance standards. In recent decades, this approach has been used in tandem with codes to ensure that equipment installed in homes and buildings is energy-efficient.

Notes

1. Determined using the Building Codes Assistance Project (BCAP) calculator that compares each state's current code to the 2006 International Energy Conservation Code (IECC) for residential and commercial construction. The sum of savings in all 50 states produces a 30 to 40 percent savings range.

References

Building Codes Assistance Project [BCAP]. (2007a). BCAP Web site. Retrieved from www.bcap-energy.org.

Building Codes Assistance Project [BCAP]. (2007b). Maps & state overviews. Retrieved from www.bcap-energy.org/map_page.php.

California Energy Commission [CEC]. (2003, September). Initial study/proposed negative declaration for the 2005 building energy efficiency standards for residential and nonresidential buildings. (P400-03-018). Retrieved from www.energy.ca.gov/reports/2003-09-12_400-03-018.PDF.

Ecotope. (2001). Baseline characteristics of the residential sector: Idaho, Montana, Oregon, and Washington (Northwest Energy Efficiency Alliance Report #01-095). Retrieved from www.nwalliance.org/research/reports/95.pdf.

Geller, H., Mitchell, C., & Schlegel, J. (2005). Nevada energy efficiency strategy. Retrieved from www.swenergy.org/pubs/Nevada_Energy_Efficiency_Strategy.pdf.

Haberl, J., Culp, C., Yazdani, B., Fitzpatrick, T., Bryant, J., Verdict, M., Turner, D., & Im, P. (2003). Calculation of NOx emissions reduction from implementation of the 2000 IECC/IRC conservation code in Texas. Retrieved from http://esl.eslwin.tamu.edu/docs/documents/icbosb5prepring092000.pdf.

Kinney, L., Geller, H., & Ruzzin, M./Southwest Energy Efficiency Project (2003). Increasing energy efficiency in new buildings in the Southwest: Energy codes and best practices. Retrieved from www.swenergy.org/ieenb/codes_report.pdf.

Kushler, M., York, D., & White, P. (2005). Examining the potential for energy efficiency to help address the natural gas crisis in the Midwest (ACEEE Report No. U051). Retrieved from www.aceee.org/pubs/u051full.pdf.

Motamedi, L., Hall, V., & Kaneshiro, B. (2004). California energy action plan: Goal 1, optimize energy conservation and resource efficiency, status report. Retrieved September 8, 2006, from www.energy.ca.gov/energy_action_plan/meetings/2004-09-08_meeting/2004-09-08_EAP_GOAL_1.PDF.

Prindle, W., Dietsch, N., Elliott, R.N., Kushler, M., Langer, T., & Nadel, S. (2003). Energy efficiency's next generation: Innovation at the state level (ACEEE Report No. E031). Retrieved from www.aceee.org/pubs/e031full.pdf.

U.S. Department of Energy [DOE]. (2002, June). Building Energy Codes Program Web site: New York Energy Conservation Construction Code. Washington, D.C.: DOE Office of Energy Efficiency and Renewable Energy. Retrieved from www.energycodes.gov/implement/case_studies/new_york.stm.

U.S. Department of Energy [DOE]. (2006). State energy alternatives: Energy codes and standards. Retrieved from www.eere.energy.gov/states/alternatives/codes_standards.cfm.

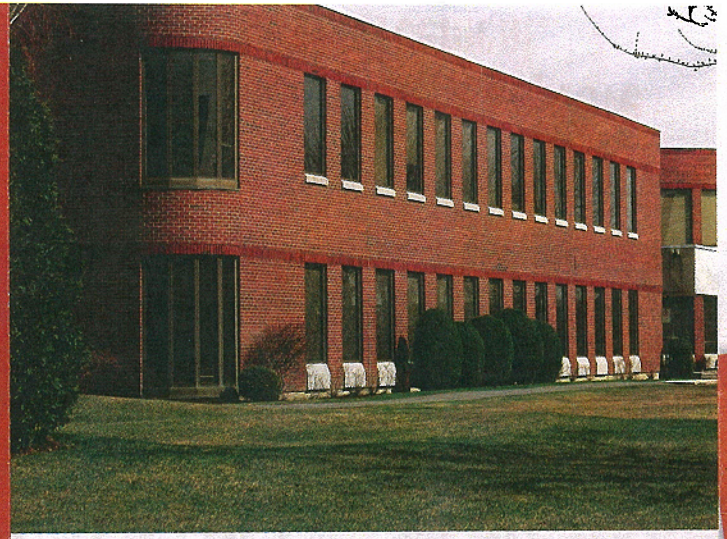
U.S. Department of Energy [DOE]. (2007). Energy Department determines that model commercial building code will save energy & benefit consumers. Retrieved from www.energycodes.gov/implement/determinations_com_news.stm.

U.S. Environmental Protection Agency [EPA]. (2006). 4.3: Building codes for energy efficiency. In Clean energy-environment guide to action: policies, best practices, and action steps for states (EPA 430-R-06-001). Retrieved from www.epa.gov/cleanenergy/stateand local/guidetoaction.htm.

Weitz, D. (2005a). (Personal e-mail, June 22, 2005).

Weitz, D. (2005b). (Personal e-mail, May 31, 2005).

If the U.S. adopted the 2006 IECC nationally, the energy saved in new buildings would be equal to that of taking 240,000 cars off the road.



About the 2006 IECC

The 2006 IECC is part of a family of building codes including the International Residential Code (IRC), the International Building Code (IBC), and the International Fire Code (IFC). It presents guidelines for energy-efficiency in both residential and commercial construction, and references the most recent energy standard for commercial buildings, issued by the American Society of Heating, Refrigerating and Air-Conditioning Engineers.

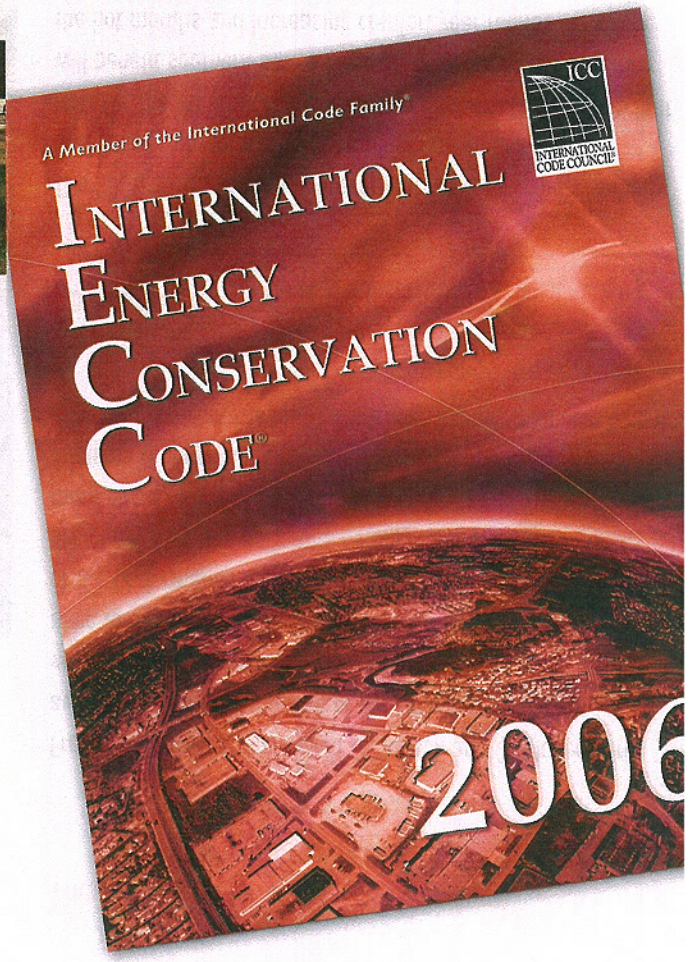
To order your copy go to:
www.iccsafe.org/store or call 1.800.786.4452

For More Information, Visit:

- Building Codes Assistance Project (BCAP)
  www.bcap-energy.org
- Responsible Energy Codes Alliance (RECA)
  www.reca-codes.org

• B C A P •
Building Codes Assistance Project

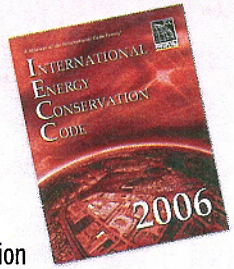
Meet the 2006 International Energy Conservation Code



- Simple Language
- Easy to Use
- Includes Improvements in Energy Efficiency

What's New in the 2006 IECC?

Meet the 2006 IECC!



The 2006 International Energy Conservation Code (IECC) is the most recent energy code publication issued by the International Code Council. The 2006 IECC is designed to be more simple to understand and easy to use. And, it includes improvements in energy efficiency particularly in the cooling-dominated climate of the south and southwest.

- If the 2006 IECC were to be adopted nationally, there would be a cumulative energy savings of 3 quadrillion BTUs (British Thermal Units).
- Adoption would represent a five percent reduction of energy use in new buildings, and would save 14.3 trillion BTUs annually, the equivalent amount of energy saved if 240,000 cars were kept off the roads for a year.
- The energy savings in the 2006 IECC benefit consumers, builders, code officials, the environment and society.

Simpler to Understand

The 2006 code has several elements that make it simpler to understand. The prescriptive insulation and window requirements for energy-efficient construction are now consolidated into one table, essentially making a checklist of compliance items. The window-to-wall ratio requirements in older versions of the IECC are eliminated in the 2006 code. Also, the climate zones are now delineated by jurisdictional (county) boundaries, so each jurisdiction is sure to have only one set of energy-efficient terms of construction. The commercial code is also simpler, with increased clarity and reduced redundancy.

Easier to Use and Enforce

The new code's structure, contents, and organization make it the most practical energy conservation construction code the ICC has produced to date.

The code is much easier to understand, much easier to comply with, and is much easier to enforce.

Free software programs called REScheck and COMcheck are available to download online at the Department of Energy's website www.energycodes.gov. These programs make compliance to the energy code easy, whether using the prescriptive or the performance approach in achieving an energy-efficient structure. Also, the performance approach in the 2006 IECC more closely mirrors the guidelines of the Home Energy Rating Systems (Energy Star's foundation), so comparing these energy efficiency guidelines is much more user-friendly than ever before.

Committed to Continual Improvements in Energy Efficiency

The 2006 IECC contains improvements in code requirements that range from insulation to window ratings to systems. Notably, the 2006 IECC includes upgraded insulation levels that will benefit southern states by keeping buildings cooler during the hot months and increasing comfort year round.

If your state is entering its next code improvement process, consider the 2006 IECC to help improve compliance and ease enforcement.

LEED for New Construction v 2.2
Registered Project Checklist

Project Name: _____

Project Address: _____

Yes	?	No		
			Project Totals (Pre-Certification Estimates)	69 Points
			Certified: 26-32 points **Silver:** 33-38 points **Gold:** 39-51 points **Platinum:** 52-69 points	

Yes	?	No			
			Sustainable Sites		14 Points
Yes			Prereq 1	**Construction Activity Pollution Prevention**	Required
			Credit 1	**Site Selection**	1
			Credit 2	**Development Density & Community Connectivity**	1
			Credit 3	**Brownfield Redevelopment**	1
			Credit 4.1	**Alternative Transportation**, Public Transportation	1
			Credit 4.2	**Alternative Transportation**, Bicycle Storage & Changing Rooms	1
			Credit 4.3	**Alternative Transportation**, Low-Emitting & Fuel Efficient Vehicles	1
			Credit 4.4	**Alternative Transportation**, Parking Capacity	1
			Credit 5.1	**Site Development**, Protect or Restore Habitat	1
			Credit 5.2	**Site Development**, Maximize Open Space	1
			Credit 6.1	**Stormwater Design**, Quantity Control	1
			Credit 6.2	**Stormwater Design**, Quality Control	1
			Credit 7.1	**Heat Island Effect**, Non-Roof	1
			Credit 7.2	**Heat Island Effect**, Roof	1
			Credit 8	**Light Pollution Reduction**	1

Yes	?	No			
			Water Efficiency		5 Points
			Credit 1.1	**Water Efficient Landscaping**, Reduce by 50%	1
			Credit 1.2	**Water Efficient Landscaping**, No Potable Use or No Irrigation	1
			Credit 2	**Innovative Wastewater Technologies**	1
			Credit 3.1	**Water Use Reduction**, 20% Reduction	1
			Credit 3.2	**Water Use Reduction**, 30% Reduction	1

LEED for New Construction v 2.2
Registered Project Checklist

Yes	?	No	Energy & Atmosphere	17 Points

Yes		Prereq 1	**Fundamental Commissioning of the Building Energy Systems**	Required
Yes		Prereq 1	**Minimum Energy Performance**	Required
Yes		Prereq 1	**Fundamental Refrigerant Management**	Required

***Note for EAc1:** All LEED for New Construction projects registered after June 26, 2007 are required to achieve at least two (2) points.

			Credit 1	**Optimize Energy Performance**	1 to 10
			Credit 1.1	10.5% New Buildings / 3.5% Existing Building Renovations	1
			Credit 1.2	14% New Buildings / 7% Existing Building Renovations	2
			Credit 1.3	17.5% New Buildings / 10.5% Existing Building Renovations	3
			Credit 1.4	21% New Buildings / 14% Existing Building Renovations	4
			Credit 1.5	24.5% New Buildings / 17.5% Existing Building Renovations	5
			Credit 1.6	28% New Buildings / 21% Existing Building Renovations	6
			Credit 1.7	31.5% New Buildings / 24.5% Existing Building Renovations	7
			Credit 1.8	35% New Buildings / 28% Existing Building Renovations	8
			Credit 1.9	38.5% New Buildings / 31.5% Existing Building Renovations	9
			Credit 1.10	42% New Buildings / 35% Existing Building Renovations	10
			Credit 2	**On-Site Renewable Energy**	1 to 3
			Credit 2.1	2.5% Renewable Energy	1
			Credit 2.2	7.5% Renewable Energy	2
			Credit 2.3	12.5% Renewable Energy	3
			Credit 3	**Enhanced Commissioning**	1
			Credit 4	**Enhanced Refrigerant Management**	1
			Credit 5	**Measurement & Verification**	1
			Credit 6	**Green Power**	1

LEED for New Construction v 2.2
Registered Project Checklist

Yes	?	No			
			Materials & Resources		**13 Points**
Yes					
			Prereq 1	**Storage & Collection of Recyclables**	Required
			Credit 1.1	**Building Reuse,** Maintain 75% of Existing Walls, Floors & Roof	1
			Credit 1.2	**Building Reuse,** Maintain 95% of Existing Walls, Floors & Roof	1
			Credit 1.3	**Building Reuse,** Maintain 50% of Interior Non-Structural Elements	1
			Credit 2.1	**Construction Waste Management,** Divert 50% from Disposal	1
			Credit 2.2	**Construction Waste Management,** Divert 75% from Disposal	1
			Credit 3.1	**Materials Reuse,** 5%	1
			Credit 3.2	**Materials Reuse,** 10%	1
			Credit 4.1	**Recycled Content,** 10% (post-consumer + 1/2 pre-consumer)	1
			Credit 4.2	**Recycled Content,** 20% (post-consumer + 1/2 pre-consumer)	1
			Credit 5.1	**Regional Materials,** 10% Extracted, Processed & Manufactured	1
			Credit 5.2	**Regional Materials,** 20% Extracted, Processed & Manufactured	1
			Credit 6	**Rapidly Renewable Materials**	1
			Credit 7	**Certified Wood**	1

Yes	?	No			
			Indoor Environmental Quality		**15 Points**
Yes					
Yes					
			Prereq 1	**Minimum IAQ Performance**	Required
			Prereq 2	**Environmental Tobacco Smoke (ETS) Control**	Required
			Credit 1	**Outdoor Air Delivery Monitoring**	1
			Credit 2	**Increased Ventilation**	1
			Credit 3.1	**Construction IAQ Management Plan,** During Construction	1
			Credit 3.2	**Construction IAQ Management Plan,** Before Occupancy	1
			Credit 4.1	**Low-Emitting Materials,** Adhesives & Sealants	1
			Credit 4.2	**Low-Emitting Materials,** Paints & Coatings	1
			Credit 4.3	**Low-Emitting Materials,** Carpet Systems	1
			Credit 4.4	**Low-Emitting Materials,** Composite Wood & Agrifiber Products	1
			Credit 5	**Indoor Chemical & Pollutant Source Control**	1
			Credit 6.1	**Controllability of Systems,** Lighting	1
			Credit 6.2	**Controllability of Systems,** Thermal Comfort	1
			Credit 7.1	**Thermal Comfort,** Design	1
			Credit 7.2	**Thermal Comfort,** Verification	1
			Credit 8.1	**Daylight & Views,** Daylight 75% of Spaces	1
			Credit 8.2	**Daylight & Views,** Views for 90% of Spaces	1

LEED for New Construction v 2.2
Registered Project Checklist

Yes	?	No			
			Innovation & Design Process		**5 Points**
			Credit 1.1	**Innovation in Design:** Provide Specific Title	1
			Credit 1.2	**Innovation in Design:** Provide Specific Title	1
			Credit 1.3	**Innovation in Design:** Provide Specific Title	1
			Credit 1.4	**Innovation in Design:** Provide Specific Title	1
			Credit 2	**LEED® Accredited Professional**	1