

**ACE**

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ADOPTION,  
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Building Energy Codes  
**ADOPTION TOOLKIT**



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# ACE

LEARNING SERIES

## Building Energy Codes **ADOPTION TOOLKIT**

Prepared by:  
Building Energy Codes Program (BECP)

The U.S. Department of Energy's (DOE) Building Energy Codes Program (BECP) is an information resource on energy codes and standards for buildings. They work with other government agencies, state and local jurisdictions, organizations that develop model codes and standards, and building industry to promote codes that will provide for energy and environmental benefits and help foster adoption of, compliance with, and enforcement of those codes.

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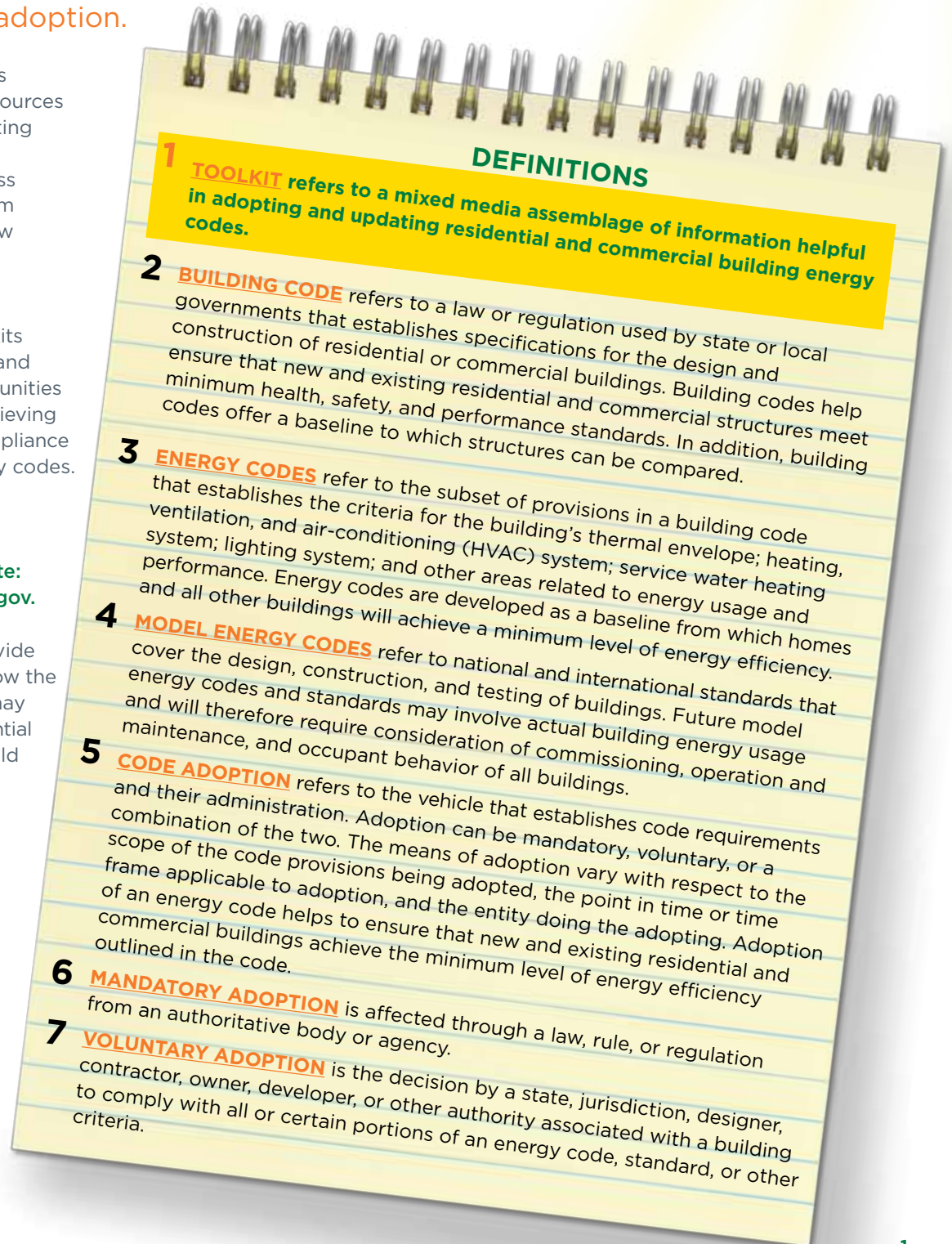
This toolkit was developed by the U.S. Department of Energy’s (DOE) Building Energy Codes Program (BECP) for use by states, municipalities, energy code advocates, policymakers, stakeholders, and all other groups with a vested interest in energy code adoption.

This toolkit provides information and resources to help guide adopting authorities through the adoption process and setting minimum requirements for new construction.

DOE has developed two additional toolkits for the compliance and enforcement communities with the goal of achieving higher levels of compliance with building energy codes.

Those toolkits can be found on the BECP website: [www.energycodes.gov](http://www.energycodes.gov).

This toolkit will provide some insight into how the adoption process may influence the residential and commercial build communities.



## Organization of the Adoption Toolkit

This toolkit is organized around eight important steps for energy code adoption.

**Steps for Adoption**

- 1 Understand** the benefits of code adoption
- 2 Identify** a code support infrastructure
- 3 Identify** the appropriate adoption process and framework
- 4 Select** the appropriate code for adoption
- 5 Determine** crucial components of the energy code: scope and applicability, format, adoption date, and effective date
- 6 Overcome** the barriers of adoption
- 7 Outline** who is responsible for satisfying what is adopted
- 8 Receive** assistance on energy code and adoption questions

Each step in this toolkit includes a general description, recommendations, and a listing of resources for policymakers, advocates, and individuals involved in the adoption process.



# Acronyms and Abbreviations

## CHAPTER 2

<b>ACEEE</b>	American Council for an Energy-Efficient Economy
<b>AIA</b>	American Institute of Architects
<b>ANSI</b>	American National Standards Institute
<b>ARRA</b>	American Recovery and Reinvestment Act of 2009
<b>ASHRAE</b>	American Society of Heating, Refrigerating and Air-Conditioning Engineers
<b>ASTM</b>	American Society for Testing and Materials
<b>BCAP</b>	Building Codes Assistance Project
<b>BCC</b>	Building Code Council
<b>BECP</b>	Building Energy Codes Program
<b>BTP</b>	U.S. Department of Energy, Building Technologies Program
<b>Btu</b>	British thermal units
<b>CSI</b>	Construction Specifications Institute
<b>DOE</b>	U.S. Department of Energy
<b>DSIRE</b>	Database of State Incentives for Renewables and Efficiency
<b>HERS</b>	Home Energy Rating System
<b>GBI</b>	Green Building Initiative
<b>ICC</b>	International Code Council
<b>IECC</b>	International Energy Conservation Code
<b>IES</b>	Illuminating Engineering Society
<b>IESNA</b>	Illuminating Engineering Society of North America
<b>IgCC</b>	International Green Construction Code
<b>LEED</b>	Leadership in Energy and Environmental Design
<b>MEEA</b>	Midwest Energy Efficiency Alliance
<b>NAHB</b>	National Association of Home Builders
<b>NBI</b>	New Buildings Institute
<b>NEEA</b>	Northwest Energy Efficiency Alliance
<b>NEEP</b>	Northeast Energy Efficiency Partnerships
<b>OCEAN</b>	Online Code Environment and Advocacy Network
<b>PNNL</b>	Pacific Northwest National Laboratory
<b>RECA</b>	Responsible Energy Codes Alliance
<b>SEEA</b>	Southeast Energy Efficiency Alliance
<b>SEO</b>	State Energy Office
<b>SWEEP</b>	Southwest Energy Efficiency Project
<b>USGBC</b>	U.S. Green Building Council

# Understand the Benefits of Code Adoption

Before beginning the code adoption process, it is beneficial for states and jurisdictions to identify the benefits realized through energy code adoption.

## DESCRIPTION

The primary goal of an energy code or standard is to conserve energy. Commercial buildings and residential households in the United States consume nearly 50% of the nation's total primary energy, 70% of the nation's electricity, and one-third of the nation's greenhouse emissions.<sup>1</sup> A report by the McKinsey Global Institute found that America could reduce energy use in new and existing buildings by more than one quarter by 2020 with measures that pay for themselves within 10 years.<sup>2</sup> Energy code adoption enables new and renovated residential and commercial structures to achieve the energy efficiency outlined in the code.

In addition to energy efficiency, energy codes:

- **Save money.** The energy and cost savings that result from adoption of energy codes can be significant. It is estimated that building energy codes will produce a financial benefit to owners of nearly \$2 billion annually by 2015, rising to over \$15 billion annually by 2030. This benefit is achieved by saving over 14 quadrillion Btu of energy from 2009–2030, an estimated annual savings of 1.7 quadrillion Btu by 2030.<sup>3</sup> Consider this case in point: Studies show that transforming the building sector to employ more energy-efficient designs, equipment, and solar power could cut projected overall household energy expenses from \$285 billion to \$130 billion by 2030. Failing to catalyze building sector transformations will raise the cost of meeting long-term climate goals by at least \$500 billion per year globally.<sup>4</sup>
- **Reduce emissions.** Buildings use a significant amount of energy and, as a result, create considerable emissions. The projected energy savings from energy codes translates into an estimated cumulative savings by 2030 of 800 million metric tons of CO<sub>2</sub>—equivalent to removing 145 million vehicles from our nation's roadways. A study conducted by the Climate Policy Initiative found that states that adopted federal building energy codes reduced household energy usage by 10% and household greenhouse gas emissions by 16% from 1986–2008.<sup>5</sup>
- **Create jobs.** The innovative use of improved technology in buildings and the increasing need for energy code experts will create employment opportunities around the nation. As new codes are created for greater energy efficiency in buildings, many new jobs will become available, including technical experts, duct and air leakage professionals, quality control assessors, building and system commissioning agents, energy auditors, and compliance officers. Completing project retrofits and building weatherization will create new employment opportunities as well.

1 <http://ase.org/resources/building-energy-codes-fact-sheet>

2 <http://ase.org/resources/building-energy-codes-fact-sheet>

3 Belzer P, M Halverson, and S McDonald. 2010. *A Retrospective Analysis of Commercial Building Energy Codes: 1990-2008*. Building Energy Codes Program, Pacific Northwest National Laboratory, Richland, Washington.

4 Houser T. 2009. *The Economics of Energy Efficiency in Buildings*. Policy Brief 09-17, Peterson Institute for International Economics, Washington, D.C. Accessed January 13, 2009 at [www.iie.com/publications/pb/pb09-17.pdf](http://www.iie.com/publications/pb/pb09-17.pdf).

5 <http://climatepolicyinitiative.org/>



The U.S. Green Building Council (USGBC) conducted a study on the number of jobs associated with green building practices. The results show that the economic impact from green building construction is significant and will continue to grow as the demand for green buildings rises.

Green construction spending currently supports over 2 million jobs and generates over \$100 billion in gross domestic product and wages. By the year 2013, this study estimates that green buildings will support nearly 8 million jobs across occupations ranging from construction managers and carpenters to truck drivers and cost estimators. USGBC also supports job creation and economic activity. Leadership in Energy and Environmental Design (LEED) related spending has already generated 15,000 jobs since 2000, and by 2013 this study forecasts that an additional 230,000 jobs will be created.<sup>6</sup>

- **Protect consumers and support grid reliability.** Energy codes reduce utility costs, improve indoor air quality and reduce emissions—protecting consumers and bolstering the economy. More stringent energy code provisions reduce heating and cooling costs, not only making comfortable living conditions more affordable, but also putting money back into the pockets of consumers. Additional funds allow consumers to spend more on other goods and services—individuals have more money

to spend on items in the local economy and business owners have more money to spend on business improvements, including investments and employee benefits. Energy code provisions also reduce pollution and greenhouse gas emissions, improving the indoor air quality of homes and businesses and keeping consumers comfortable and healthy. Knowing the energy efficiency of buildings and homes also allows consumers to make educated, informed decisions when buying, renting, or leasing a building and protects consumers from expensive utility bills and future retrofits. Through system sizing and increased controls, energy codes are able to curb the impact that buildings have on the energy grid. By decreasing

the impact and peak loads of buildings, energy codes help lessen the stress on the grid, which increases grid reliability. In addition, energy codes that reduce building energy consumption also help reduce our nation's dependency on foreign energy sources.

- **Improve health.** The Building Codes Assistance Project (BCAP) reported that the Centers for Disease Control and Prevention found that burning fossil fuels contributed to numerous health issues, such as asthma, bronchitis, pneumonia, and low birth weight, among others. As a result, health care costs have increased to cover emergency room and hospital expenses. Energy-efficient buildings reduce fossil fuel emissions and thus lower the risk of related health issues.



6 [www.usgbc.org/ShowFile.aspx?DocumentID=6435](http://www.usgbc.org/ShowFile.aspx?DocumentID=6435)



### RECOMMENDATIONS

States and jurisdictions will benefit greatly by understanding and discussing the benefits of code adoption in relation to their particular energy goals. It is important, however, to understand that the benefits of code adoption vary greatly by audience. Consumers and building owners will generally be interested in much different code benefits than an elected official or policymaker.

When discussing the benefits of energy code adoption, tailor your argument towards a specific audience. BECP and the Online Code Environment and Advocacy Network (OCEAN) have created resource guides to educate groups and individuals interested in and affected by energy code adoption. These resource guides, as well as additional pamphlets, fact sheets, and benefit overviews are listed in the resources section in this chapter.

In addition, producing a fact sheet that is state- or jurisdiction-specific may have the greatest impact on the intended audience. Mississippi, for example, has created a suite of energy code fact sheets for residential and commercial energy codes as they relate to the build environment in the state (Resources 1-3 in this chapter). These fact sheets highlight code benefits, energy savings, case studies, and additional resources. State-specific information regarding incremental cost analysis, including break-even point and return on investment, for upgrading to the 2009 and 2012 IECC is available through the OCEAN website (<http://energycodes.ocean.org>) and could be used to compile an energy code fact sheet for your state.

<b>CHAPTER 3 RESOURCES</b>	
<b>1. Energy Codes Create Better Homes</b>	<a href="http://www.mississippi.org/assets/docs/energy/homeowner-faq.pdf">www.mississippi.org/assets/docs/energy/homeowner-faq.pdf</a>
<b>2. Residential Energy Codes Build a Better Bottom Line</b>	<a href="http://www.mississippi.org/assets/docs/energy/residential-faq.pdf">www.mississippi.org/assets/docs/energy/residential-faq.pdf</a>
<b>3. Commercial Energy Codes Build a Better Bottom Line</b>	<a href="http://www.mississippi.org/assets/docs/energy/commercial-faq.pdf">www.mississippi.org/assets/docs/energy/commercial-faq.pdf</a>
<b>4. Why Energy Codes Matter: What Advocates Need to Know</b>	<a href="http://energycodesocean.org/resource/why-energy-codes-matter-what-advocates-need-know">http://energycodesocean.org/resource/why-energy-codes-matter-what-advocates-need-know</a>
<b>5. Why Energy Codes Matter: What Policy Makers Need to Know</b>	<a href="http://energycodesocean.org/resource/why-energy-codes-matter-what-policy-makers-need-know">http://energycodesocean.org/resource/why-energy-codes-matter-what-policy-makers-need-know</a>
<b>6. Why Energy Codes Matter: What Consumers Need to Know</b>	<a href="http://energycodesocean.org/resource/why-energy-codes-matter-what-consumers-need-know">http://energycodesocean.org/resource/why-energy-codes-matter-what-consumers-need-know</a>
<b>7. Building Energy Codes Resource Guide for Policy Makers</b>	<a href="http://www.energycodes.gov/sites/default/files/documents/BECP_Policy_Maker_Resource%20Guide_June2011_v00_lores.pdf">www.energycodes.gov/sites/default/files/documents/BECP_Policy_Maker_Resource%20Guide_June2011_v00_lores.pdf</a>
<b>8. Top Ten Reasons for Building Energy Codes</b>	<a href="http://www.energycodes.gov/top-ten-reasons-building-energy-codes-0">www.energycodes.gov/top-ten-reasons-building-energy-codes-0</a>
<b>9. Building Energy Codes Fact Sheet</b>	<a href="http://ase.org/resources/building-energy-codes-fact-sheet">http://ase.org/resources/building-energy-codes-fact-sheet</a>
<b>10. Why Adopt Energy Codes?</b>	<a href="http://energycodesocean.org/sites/default/files/resources/Why%20Adopt%20Energy%20Codes_0.pdf">http://energycodesocean.org/sites/default/files/resources/Why%20Adopt%20Energy%20Codes_0.pdf</a>
<b>11. Building Codes for Energy Efficiency</b>	<a href="http://www.epa.gov/cleanenergy/documents/suca/buildingcodesfactsheet.pdf">www.epa.gov/cleanenergy/documents/suca/buildingcodesfactsheet.pdf</a>
<b>12. Green Jobs Study</b>	<a href="http://www.usgbc.org/ShowFile.aspx?DocumentID=6435">www.usgbc.org/ShowFile.aspx?DocumentID=6435</a>

## Identify a Code Support Infrastructure

### DESCRIPTION

Before adopting or revising an energy code, it is important that state and local governments assemble an advisory body comprising representatives of the design, building construction, and enforcement communities as well as interested stakeholders. This collection of individuals serves as the code support infrastructure that determines which energy standards and model energy codes should be adopted. The group also considers the need to modify codes and standards to account for local preferences and construction practices. During the adoption process, this body may serve as a point of contact for information on the code and as an entity to raise public awareness of the benefits of code adoption.

When establishing a code support infrastructure, it is important to be inclusive. Begin with a stakeholder group that includes, at a minimum, affected government agencies and departments, local building professionals, and special interest groups. Successful code support typically results from the presence of the following stakeholders in the adoption process:

- Architects, lighting designers, mechanical and electrical engineers and other design community representatives
- Builders and contractors
- Building code officials and other code enforcement agencies
- Building owners and operators
- Local elected officials
- A range of city staff representing building, planning, and other affected departments



- Homebuilders association members
- Tradespeople, home inspectors, and raters
- Utility companies
- Industry and manufacturers for the building industry
- Energy and water conservation specialists
- Interested community activists and representatives
- Federal agency staff, including BECP.

Developing a diverse support infrastructure encourages public acceptance of an energy code adoption or update. Resources 1, 2, and 3 in this chapter provide information on identifying stakeholders, finding support for adoption legislation, and effectively speaking to legislators. Ideally, the group will work together to establish goals, educate stakeholders, and encourage code outreach. Resource 4 in this chapter is a state compliance, implementation, and enforcement guide with helpful information on collaboration.

Utilities can play several roles in support of building energy codes. Examples include partnering with states and localities during code adoption to fill information gaps, providing analytic support, and engaging stakeholders.

Utilities also can help educate the building and enforcement communities about specific requirements contained in new codes.<sup>7</sup>

<sup>7</sup> [www.epa.gov/cleanenergy/documents/suca/buildingcodesfact-sheet.pdf](http://www.epa.gov/cleanenergy/documents/suca/buildingcodesfact-sheet.pdf)

## RECOMMENDATIONS

### Establish Goals

Selecting or developing the appropriate code for adoption is contingent upon setting clearly articulated state or local goals with specific, measurable objectives. Goals are usually established by elected officials with support from municipal departments, such as planning and building. Other key stakeholders are included in the process to gain consensus on the goals. Once clear goals have been established, energy codes are adopted to codify the goals and to offer a timeline and guidelines for accomplishing objectives.

### Educate Stakeholders

Providing education and training to stakeholders and other groups within the code support infrastructure during the planning of an energy code is a critical step in the adoption process. Education provides the foundation for a common understanding of the intent and technical requirements of the energy code. It is beneficial to provide education and training to code-adoption decision makers, enforcement entities, industry stakeholders, compliance assessors, and to some degree, the public. To be most effective, education and training needs to target the full range of audiences, providing timely, critical information on the code in an acceptable format and package based on audience needs and area of focus.



### There are three distinct phases for education and training delivery.

1. Pre-adoption education and training supports the informational needs associated with securing adoption of an energy code. Education before adoption should focus on the differences between current practice under the existing code and the new code and the subsequent value that will be delivered with adoption. This phase of training works best when implemented with an outreach component that solicits public inquiry and comment.
2. Once the code has been adopted and an effective date has been set, those responsible for code implementation must be educated on the scope and technical attributes. Post-adoption training should focus on preparing responsible parties for the successful implementation of the energy code. At this point, education and training must deliver clear information on code-specific measures and facilitate discussions that lead to an understanding of energy code scope and application.
3. The third phase of education and training comes after the date the code goes into effect. It is very similar to post-adoption training, but typically includes more knowledgeable industry discussion related to specific needs. For example, an architect may want to discuss compliance choices in greater detail to better understand the best approach for a building type or occupancy. Education and training in this phase can also support compliance by delivering targeted information on assessment protocol, documentation, and code effectiveness. A formal feedback loop should be established between compliance and education to provide direction for future training based on actual field observation and documentation of compliance issues.

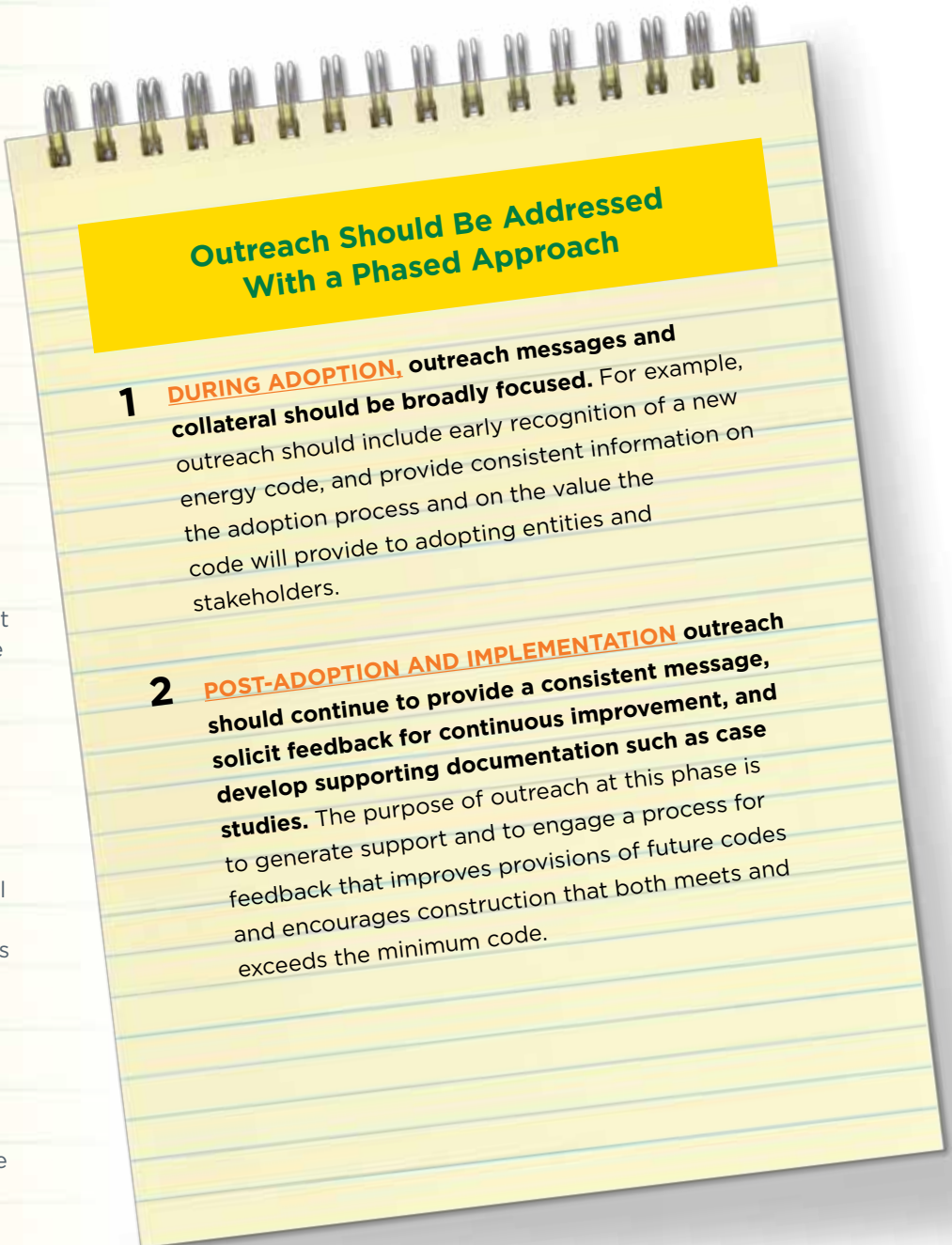
**Education and training should be an integral part of energy code development, adoption, and delivery. Strategic education and training supports a clearer understanding of the code and can help ensure that the goals of the code are fully realized.**

**Encourage Outreach**

Similar to training, outreach can help ensure that any energy code-related activity or event is purposefully vetted and supported. Outreach can be considered the underlying structure or basis for all dialogue, discussion, training, and collateral that is initiated or generated in support of the code.

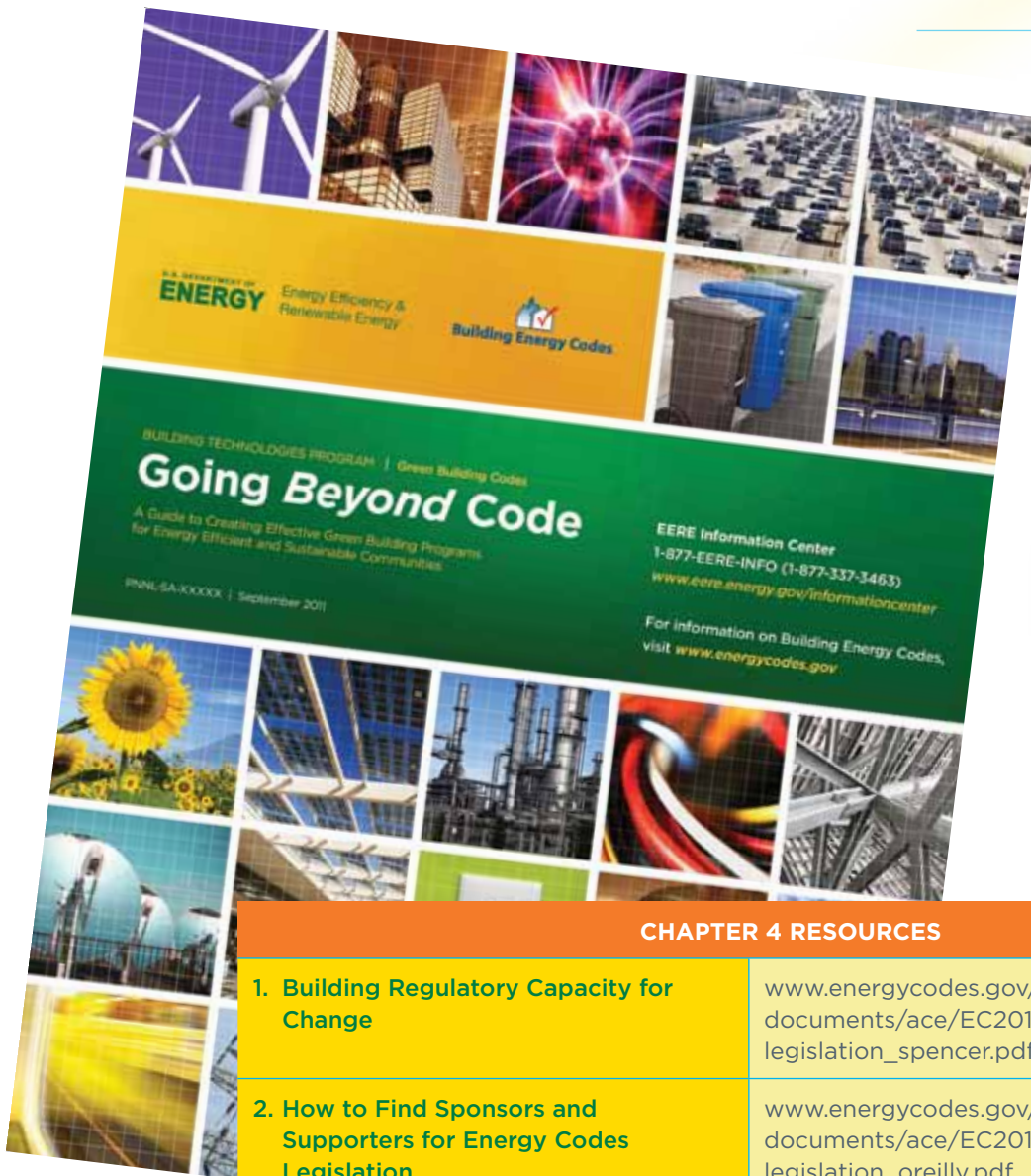
Developing an outreach plan is one of the first steps to take when looking to adopt an energy code. An outreach plan deploys the message of the code and identifies those who need or will benefit most from the energy code message, the timeline and venues for delivering the message, and the format in which the message is presented.

Outreach should include an approach for soliciting feedback from the stakeholders and entities affected by the energy code as well as an approach for assessing the value that the energy code provides to those affected parties, such as building owners, the construction industry, state agencies, local jurisdictions, and utilities. When adopting an energy code, a jurisdiction generally does not know the full extent of the outcome or effect. Outreach sets a path to continuously learn from the energy code endeavors and improve the communications regarding the code.



Outreach is a dynamic approach to communication and education that supports the energy code through an ongoing and cyclical process.

It is developed, delivered, and adapted to foster a consistent understanding of the intent of the energy code. Resource 1 in this chapter provides best practice strategies for developing outreach materials and tools.



CHAPTER 4 RESOURCES

1. Building Regulatory Capacity for Change	<a href="http://www.energycodes.gov/sites/default/files/documents/ace/EC2011_developing_draft_legislation_spencer.pdf">www.energycodes.gov/sites/default/files/documents/ace/EC2011_developing_draft_legislation_spencer.pdf</a>
2. How to Find Sponsors and Supporters for Energy Codes Legislation	<a href="http://www.energycodes.gov/sites/default/files/documents/ace/EC2011_developing_draft_legislation_oreilly.pdf">www.energycodes.gov/sites/default/files/documents/ace/EC2011_developing_draft_legislation_oreilly.pdf</a>
3. What Works and What Doesn't When Talking to Legislators	<a href="http://www.energycodes.gov/sites/default/files/documents/ace/EC2011_developing_draft_legislation_majersik.pdf">www.energycodes.gov/sites/default/files/documents/ace/EC2011_developing_draft_legislation_majersik.pdf</a>
4. State Compliance, Implementation, and Enforcement Guide (Iowa example)	<a href="http://www.energycodes.gov/sites/default/files/documents/IA_cie_guide.pdf">www.energycodes.gov/sites/default/files/documents/IA_cie_guide.pdf</a>
5. Going Beyond Code: A Guide for Creating Effective Green Building Programs for Energy Efficient and Sustainable Communities	<a href="http://www.energycodes.gov/sites/default/files/documents/GoingBeyondCode.pdf">www.energycodes.gov/sites/default/files/documents/GoingBeyondCode.pdf</a>
6. Compliance Verification Paths Report	<a href="http://www.energycodes.gov/sites/default/files/documents/compliance_verification_paths.pdf">www.energycodes.gov/sites/default/files/documents/compliance_verification_paths.pdf</a>

# Identify the Appropriate Adoption Process and Framework

## DESCRIPTION

Once the code support infrastructure has established clear, measurable goals for a new energy code or an update to an existing energy code, the state or jurisdiction should choose the appropriate adoption process and framework. For many states, this process has already been established. Adoption of energy codes at the state and local level generally occurs directly through legislative action or by regulatory action through agencies authorized by the legislative body to oversee the development and adoption of a code. The result is a mandatory energy code. However, there are voluntary means of adopting an energy code that are viable options for states without authority to adopt statewide codes, local governments that have higher energy efficiency goals, and other entities interested in energy code adoption.



## Voluntary Adoption

Voluntary adoption is the decision by a state, jurisdiction, designer, contractor, owner, developer, or any other authority associated with a building to comply with all or certain portions of an energy code. Adoption of any energy code provision is considered voluntary when the individual or entity that is responsible for the adoption decides to comply or require compliance with no mandate to do so. The motivation for such adoption can include saving energy, reducing operating expenses, corporate policy, incentives, or simply gaining a position in the market. For speculative properties, voluntary adoption is not likely to be considered unless the building

owner/developer feels that the economics or other attributes are such that the building has an increased desirability in the market compared to competing buildings. Where the building owner/developer is also the operator of the building, such as in federal, state, or local government buildings, any increase in first cost associated with adopting an energy code can be weighed against the life-cycle costs of operating the building. National corporations in hospitality, recreation, food, and mercantile can also adopt energy or green building codes or programs, or both, to reduce operating costs, increase the market value of a building, and improve the way they are viewed by consumers.

## Mandatory Adoption

The mandatory adoption of an energy code or standard is affected through a law, rule, or regulation from an authoritative body or agency. Details of the adoption process vary depending on whether the energy code is adopted via legislation or regulation by a statewide or local government. However, the process generally includes the following steps.

1. A proposal is initiated by a legislative body or regulatory agency with the authority to promulgate energy codes. Interested or affected parties also may initiate a change. Typically, an advisory body is convened and will recommend a new energy code or revisions



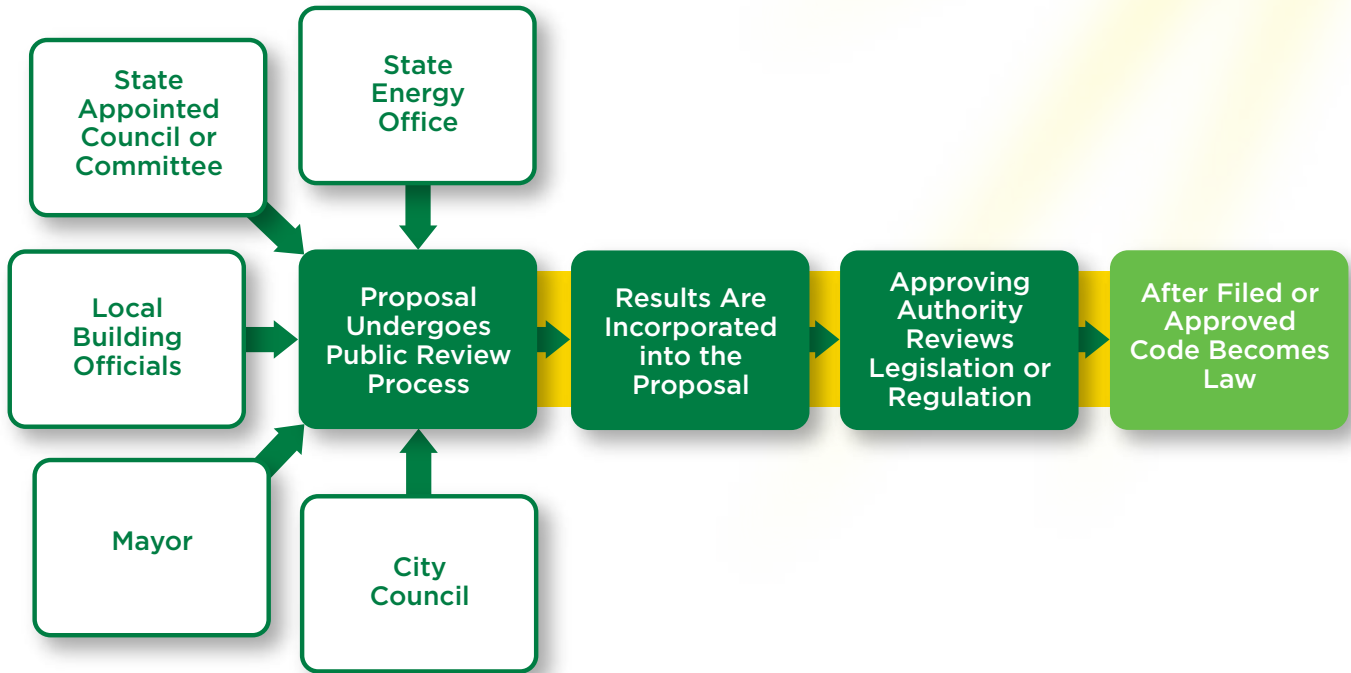


Figure 1. Mandatory energy code adoption process overview

1. The proposal is developed and submitted to the approving authority. Typical initiators include state energy offices, state-appointed energy code councils, local building official associations, mayors, and city councils.
2. The proposal undergoes public review consistent with the legislative or regulatory process under which the code is being considered. Public review options include publishing a notice in key publications, filing notices of intent, and holding public hearings. Interested and affected parties are invited to submit written or oral comments.
3. The results of the review process are incorporated into the proposal, and the final legislation or regulation is prepared for approval.
4. The approving authority reviews the legislation or regulation. Revisions may be submitted to the designated authority for final approval or for filing.
5. After being filed or approved, the code becomes effective, usually on a future date so that those affected by the code can become familiar with new requirements. The period between adoption and effective date typically varies from 30 days to 6 months.

#### Adoption Through Legislation

When adoption is accomplished through legislation, a committee is generally appointed to provide recommendations for the adoption of a model energy code and/or draft state-specific legislation.

State legislation rarely includes the complete text of an energy standard or model energy code. More commonly, legislation references an energy standard or model energy code that is already published. The legislation often adds administrative provisions addressing enforcement, updating, variances, and authority. Another common approach is to use legislation to delegate authority to an agency, council, or committee. The delegated authority is empowered to develop and adopt regulations governing energy-related aspects of building design and construction. Some states adopt the administrative provisions of the energy code by legislation and the technical provisions by regulation, or vice versa.



### **Adoption Through Regulation**

When adoption occurs through a regulatory process, state and local government officials or empowered regulatory agencies often appoint an advisory panel composed of representatives of the design, building construction, and enforcement communities to recommend a new energy code, or revisions to an existing energy code, that should be considered for adoption. The technical provisions of the regulations may be unique to the state, or the regulations may adopt, by reference, national energy standards or a model energy code. In basing its recommendations on model energy codes or standards, the advisory panel considers modifications to those documents to account for unique local conditions and construction practices. The panel also may serve as a source of information during the adoption process. Panel recommendations then typically enter a public review process.

### **Adoption by State Government**

Adoption at the state level can specify a mandatory compliance requirement throughout the state or require compliance in local governments (e.g., city, county, township) that have elected to adopt the code themselves. The adoption process can also stipulate when and if local government is allowed to amend the state-adopted code. For example, the Virginia Uniform Statewide Building Code cannot be amended by local governments. In Idaho, jurisdictions must adopt the same codes as adopted by the State Building Code Board and may amend that code for increased but not decreased stringency.

### **Adoption by Local Government**

If a state has limited authority to adopt an energy code, as is the case with a home rule state, or a state that cannot interfere or control on the local level, units of local government have the option to assume that responsibility.

A local government's municipal code typically includes a title or provision covering building construction, under which energy provisions can be adopted. As such, local governments can adopt standards or codes that are more energy efficient than those of the state; most local governments adopt a model energy code by reference. Resources 1, 2, and 3 in this chapter can provide information on locally adopted codes in home rule states. Colorado, a home rule state, has created a toolkit for adopting the IECC (Resource 4 in this chapter) that includes resources on the adoption and implementation of an energy code in a home rule state, as well as best practices and model ordinances.

### **Adoption by Other Means**

Although model codes are most commonly adopted through legislation, regulation, rules, or other action by state or local government, there are other mandatory means of adopting such documents in whole or in part. One way is through a contract for services such as design, construction, procurement of equipment and products, commissioning, or even building operation. For instance, most federal agency contracts for building design and construction require specific codes and standards to be the basis for building design, construction, commissioning, or operation. To secure the contract and receive payment for the services provided, the contractor must satisfy codes and standards referenced in the contract. If the scope does not cover the entire building, such

a mechanism can be applied to portions of the building, such as the renovation or replacement of a lighting system or the ongoing procurement of mechanical equipment. If the scope, format, and application of the energy code cover post-occupancy performance, a performance contract for building operation can be a vehicle for ensuring compliance with post-occupancy requirements.

**Current Framework**

As discussed previously, code adoption is generally achieved either through legislative or regulatory action. States and jurisdictions across the nation are utilizing a variety of frameworks that vary based on adoption process, adopting body, and applicability of the code throughout the state. These frameworks include:

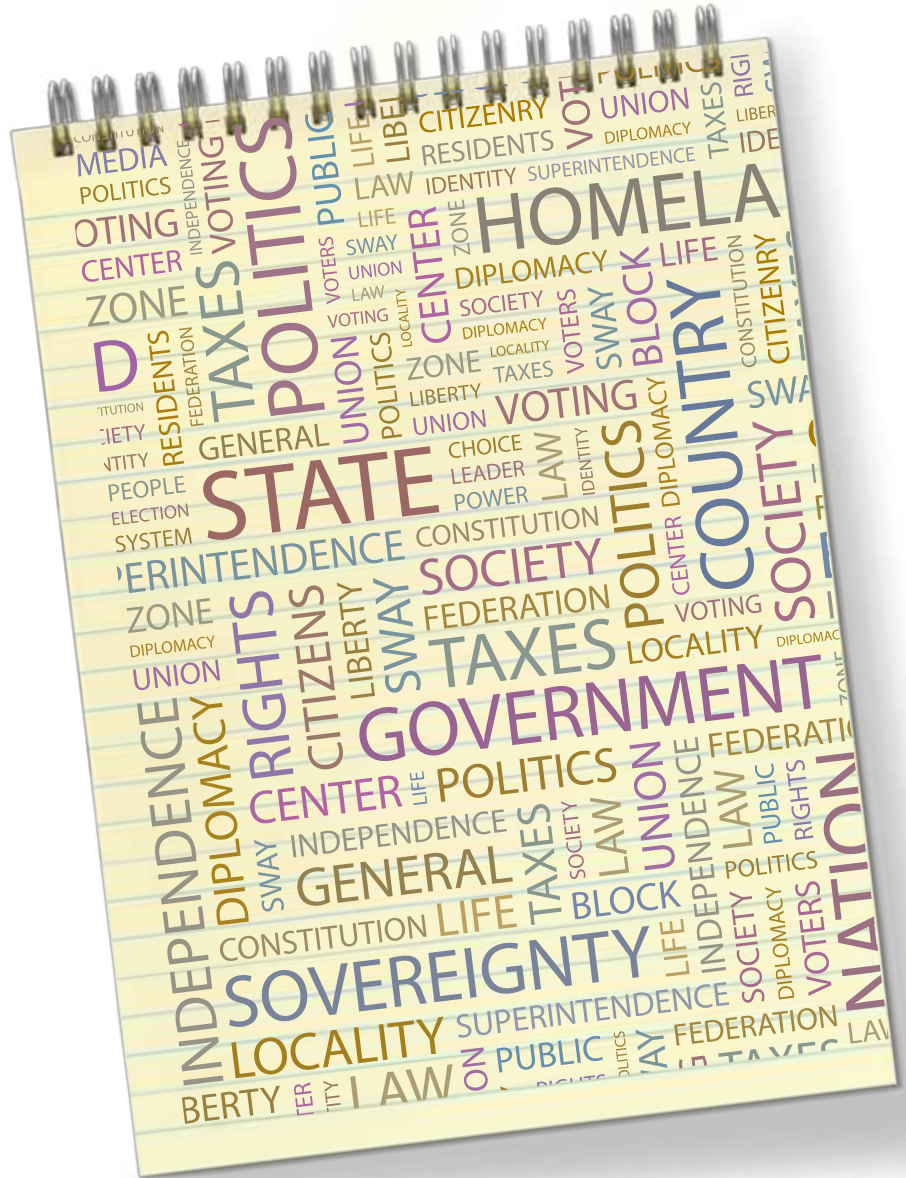
- Statewide, uniform adoption by legislative enactment
- Statewide adoption by a board established by law, with authority to adopt codes statewide
- Statewide adoption by a named official, such as a state fire marshal
- Statewide adoption by a board, with a legislative approval or veto mechanism
- Statewide adoption of a minimum code, with authority of local jurisdictions to adopt more stringent codes
- Statewide adoption of a maximum code, with local governments able to choose to adopt or not adopt the state code
- No statewide adoption, but a required code minimum/

maximum or specific requirements for local jurisdictions that choose to adopt a code

- No statewide adoption, with authority for local government to adopt a code of its choosing (home rule).

Resource 5 in this chapter, created by the International Code Council (ICC), provides a description of the adoption process of each state.

Specific legislation for several states can be found in BECP’s “Model Policy Database” (Resource 6 in this chapter). In addition, BCAP’s “Policy Action Tool” (Resource 7 in this chapter) provides a variety of legislation for use by states as templates. The Policy Action Tool covers initial energy code adoption, updating an energy code, and increasing uniformity across a state, among other topics.



## CHAPTER 5 (Continued)

### RECOMMENDATIONS

It is important first to determine whether energy code adoption will be voluntary or mandatory. If the code will be voluntary, explore available incentives that can be used to encourage energy code use. Effective incentives save individuals time and/or money, build capacity through training or design education, or add value to a business through subsidized marketing, increased building valuation, or positive public relations. Many entities may offer incentives, including

state and local government agencies, utilities, and insurance underwriters. The most common incentives include expedited plan review and permitting, increased building valuation, property and income tax reductions, permit variances, marketing, utility rate reduction, and education. The Database of State Incentives for Renewables and Efficiency (DSIRE) is an excellent resource that provides state-by-state information regarding energy use incentives and policies (Resource 8 in this

chapter). “Going Beyond Code: A Guide for Creating Effective Green Building Programs for Energy Efficient and Sustainable Communities” (Resource 9 in this chapter) also details local and statewide incentive programs.

**When the adopted code will be mandatory, select the most appropriate adoption process or work within the adoption process already established by a state. Ensure that the adoption process is clear and consistent and enforce automatic updates when available.**

### CHAPTER 5 RESOURCES

1. DOE’s Building Energy Codes Program Status of State Energy Codes Database	<a href="http://www.energycodes.gov/adoption/states">www.energycodes.gov/adoption/states</a>
2. ICC’s Adoption Database	<a href="http://www.iccsafe.org/gr/pages/adoptions.aspx">www.iccsafe.org/gr/pages/adoptions.aspx</a>
3. BCAP Status of State Energy Codes	<a href="http://bcap-ocean.org/code-status">http://bcap-ocean.org/code-status</a>
4. Initial Adoption—Getting Started/First Steps to Immediate IECC Benefits	<a href="http://www.colorado.gov/energycodes">www.colorado.gov/energycodes</a>
5. Code Adoption Process by State	<a href="http://www.iccsafe.org/gr/documents/AdoptionToolkit/HowStatesAdopt_I-Codes.pdf">www.iccsafe.org/gr/documents/AdoptionToolkit/HowStatesAdopt_I-Codes.pdf</a>
6. Model Policy Website	<a href="http://www.energycodes.gov/resource-center/model-policies">www.energycodes.gov/resource-center/model-policies</a>
7. Policy Action Tool	<a href="http://energycodesocean.org/policy-action-tool/Level-1">http://energycodesocean.org/policy-action-tool/Level-1</a>
8. Database of State Incentives for Renewables & Efficiency	<a href="http://www.dsireusa.org/">www.dsireusa.org/</a>
9. Going Beyond Code: A Guide for Creating Effective Green Building Programs for Energy Efficient and Sustainable Communities	<a href="http://www.energycodes.gov/sites/default/files/documents/GoingBeyondCode.pdf">www.energycodes.gov/sites/default/files/documents/GoingBeyondCode.pdf</a>
10. Finding Places to Legislatively Adopt a New Energy Code	<a href="http://www.energycodes.gov/sites/default/files/documents/ace/EC2011_developing_draft_legislation_karmol.pdf">www.energycodes.gov/sites/default/files/documents/ace/EC2011_developing_draft_legislation_karmol.pdf</a>
11. Understanding Building Energy Codes and Standards	<a href="http://www.pnl.gov/main/publications/external/technical_reports/PNNL-14235.pdf">www.pnl.gov/main/publications/external/technical_reports/PNNL-14235.pdf</a>

# Select the Appropriate Code for Adoption

## DESCRIPTION

To achieve the economic, environmental, and social benefits offered by energy codes, a state or jurisdiction must select the energy code that is most appropriate for their locale. States and municipalities generally choose to either adopt a model energy code or standard or create a state-specific or local energy code. States or municipalities may also select to adopt “stretch codes”—those that go beyond the minimum requirements of an adopted energy code to achieve greater energy efficiency. In addition, states and local jurisdictions may choose to adopt policies that implement a green building rating system or policies that apply to specific structures, such as state-owned or -funded buildings.

### Model Energy Codes and Standards

Model energy codes and standards are created nationally to set minimum requirements for energy-efficient design and construction. The two primary national model energy codes that states may adopt as a baseline for the new construction or renovation of residential or commercial buildings are the IECC and ANSI/ASHRAE/IES Standard 90.1 (ASHRAE Standard 90.1), *Energy Standard for Buildings Except Low-Rise Residential Buildings*.

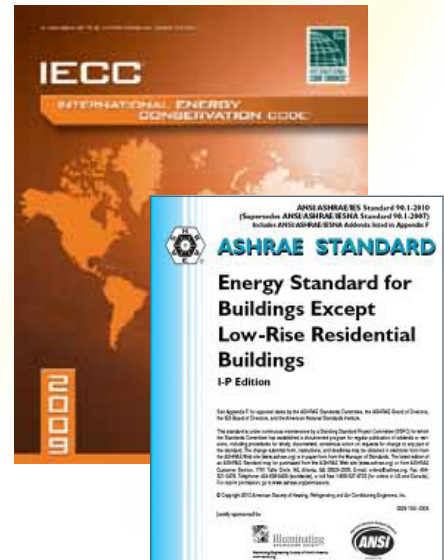
The IECC is developed by the ICC and provides energy efficiency guidelines for all residential and commercial buildings. The newest version of the code, 2012 IECC,

was published in May 2011. When adopted and implemented by states, the 2012 IECC is estimated to result in a 30% increase in energy efficiency over the 2006 IECC.<sup>8</sup>

ASHRAE Standard 90.1 is developed by the American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE) and provides energy efficiency guidelines for all commercial buildings, defined as buildings other than single-family dwellings and multifamily buildings three stories or less above grade. The newest version of that standard, ASHRAE Standard 90.1-2010, was published in August 2010. When adopted and implemented by states, ASHRAE Standard 90.1-2010 is estimated to result in an 18.2% savings in energy cost when compared to ASHRAE Standard 90.1-2007.<sup>9</sup>

There are several advantages to adopting a national model energy code or standard. Both the IECC and ASHRAE Standard 90.1 offer design and construction guidelines based on regional climates, providing states and jurisdictions with viable building techniques calculated for their specific needs. Additionally, each code and standard is developed and amended in open public forums through a consensus process. (See Resource 1 at the end of this chapter for more detailed information on how the IECC and ASHRAE Standard 90.1 are developed.) Updates to the model codes and standards occur

## CHAPTER 6



regularly with stakeholders and industry leaders collaborating to incorporate the newest technologies, processes, and materials into each updated version. Model energy codes are vetted by industry professionals and provide states and jurisdictions the infrastructure and support for successfully adopting, implementing, and enforcing an energy code.

The ICC has generated a comprehensive toolkit to assist states in adopting the IECC and other International Codes® (I-Codes®). The *Code Adoption Toolkit* includes support material that covers adoption, technical issues, and advocacy. In addition, the ICC provides code adopters with sample policy ordinances for the adoption of the 2006 IECC, 2009 IECC, and 2012 IECC. See Resource 2 in this chapter for ICC adoption ordinances.

8 [www.slideshare.net/MidwestEfficiency/2011-midwest-regional-building-energy-codes-conference](http://www.slideshare.net/MidwestEfficiency/2011-midwest-regional-building-energy-codes-conference)

9 [www.energycodes.gov/sites/default/files/documents/BECF\\_FinalQuantitativeAnalysisReport901-2010Determination\\_Oct2011\\_v00.pdf](http://www.energycodes.gov/sites/default/files/documents/BECF_FinalQuantitativeAnalysisReport901-2010Determination_Oct2011_v00.pdf)



Similarly, ASHRAE provides guidance to states and jurisdictions through advocacy support, education, and technical assistance. Like the ICC, ASHRAE offers states a number of model legislation templates tailored to the needs of the jurisdiction. Policies can be found for states or jurisdictions adopting a code for the first time or looking to update an existing energy code to the latest version (Resource 3 in this chapter).

It is generally recommended that model energy codes and standards be adopted without amendments. Unamended adoption provides states with full access to the resources available through the ICC and ASHRAE, as well as access to the tools and resources developed by DOE's BECP (Resource 4 in this chapter). As a result, states and jurisdictions save the valuable resources, including time and money, expended when developing a state-specific or local code.

It is not always feasible, however, to adopt a national model energy code. In these situations, states and jurisdictions may choose to adopt a national model code by reference and then amend the code or develop a state or local code that better fits their specific energy goals.

### State-Specific Energy Codes

State-specific energy codes are generally developed by states that find portions of the model energy codes inapplicable to their energy goals or needs and, as a result, adopt model codes by reference only. As such, states choose which requirements will be mandatory and amend the model energy code to better reflect their energy goals. See Resource 5 in this chapter for guidance on amending energy codes.

In some instances, however, states or jurisdictions adopt codes that are developed entirely from scratch. Washington and Oregon are two examples of states with

state-specific, state-written codes (see Resources 6 and 7 in this chapter for more information).

### Stretch Codes or Locally Adopted Codes

Some states, counties, and cities are now adopting beyond-code programs or stretch codes—codes that go beyond the minimum code required for all buildings in a state. In some states that do not adopt a minimum code, any code adopted at the county or city level could be considered a stretch code by this definition. In other states that do adopt relatively energy efficient codes, such as Massachusetts and Oregon, stretch codes represent an opportunity to require even better buildings.

States and jurisdictions may choose to adopt a national model green code, such as the International Green Construction Code (IgCC). Most above-code programs or stretch codes use IECC and/or ASHRAE Standard 90.1 as a baseline and include requirements that replace or expand the corresponding requirements.

For example, if the IgCC is adopted as a stretch code, it is assumed that a building will comply with the IECC and then go beyond that code to meet the additional requirements of the IgCC. Similarly, if ANSI/ASHRAE/USGBC/IES Standard 189.1 (ASHRAE Standard 189.1) is adopted as a stretch code, it is required that the building comply with ASHRAE Standard 90.1 and then go beyond that standard to meet the additional requirements of ASHRAE Standard 189.1. See Resources 8, 9, and 10 in this chapter for information on where stretch codes are in use, but also plan on checking with local code officials.

States and jurisdictions may also elect to create a beyond-code program rather than adopt and implement a national model green code. The “Going Beyond Code Guide” (Resource 11 in this chapter) will help state and local governments design and implement successful beyond-code programs for new commercial and residential buildings. The goal of the guide is to help states and localities establish voluntary or mandatory programs that go well beyond traditional minimum code requirements for new buildings. The guide addresses keys to successful adoption and implementation and discusses the primary areas that are typically included in beyond-code or green building programs, including energy efficiency materials and resource conservation, water efficiency, indoor environmental quality, and site development and land use. Detailed descriptions and analysis of actual programs are discussed, including lessons learned and best

practices. States and localities can use the information on local programs, national codes and standards, and the model energy efficiency criteria for residential and commercial buildings to find the best approach for their jurisdiction to develop and implement an effective beyond-code program.

#### **Green Building Rating System**

Many projects are being designed under green building rating systems such as the USGBC’s LEED rating system, the Green Building Initiative (GBI) Green Globes rating system for commercial buildings, or the *National Green Building Standard* (ICC 700) for residential structures. The use of green building rating systems may be voluntary or mandatory.

**Green building rating systems are intended for buildings that are being designed “better than code” and as such, minimum energy codes are met before points are awarded for improved energy performance.**

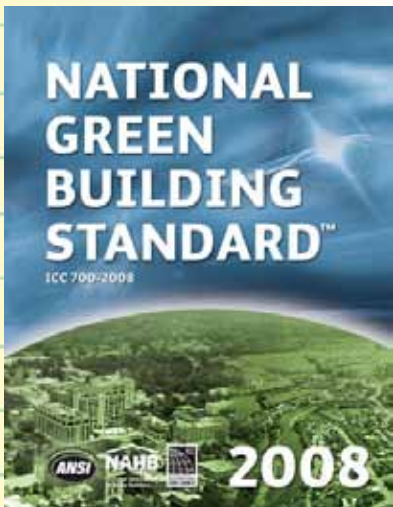
See Resources 12 and 13 in this chapter for information on where prominent green building rating systems may be required.

Key national programs and examples of how they have been adopted include:

- **Home Energy Rating System.** Commonly known as HERS, this rating system compares the energy efficiency of a home to a computer-simulated reference house. The rating involves analysis of the home’s construction plans and at least one on-site inspection. This information is used to estimate the home’s annual energy costs and give the home an index rating between 0 and 100. The lower the score, the more efficient the home. Jurisdictions such as **Boulder County, Colorado**, have mandated a particular HERS index for new residential construction.
- **ENERGY STAR®.** ENERGY STAR homes are typically 15% more energy efficient than homes built to average minimum energy codes. The U.S. Environmental Protection Agency outlines criteria for ENERGY STAR certification of homes and commercial buildings. New York State allows local jurisdictions, such as **Brookhaven**, to adopt ENERGY STAR as their minimum residential energy code.
- **EarthCraft.** Developed by Southface Energy Institute in partnership with the Building America Program, EarthCraft House is a point-based program that includes ENERGY STAR certification and 2006 IECC in its baseline. The program is used in Alabama, South Carolina, Tennessee, Virginia, and Georgia. The **City of Nashville** also offers incentives for EarthCraft homes.

## CHAPTER 6 (Continued)

- **Collaborative for High Performing Schools.** This rating system mandates energy efficiency 25% above ASHRAE Standard 90.1-2004. Originally a California standard, it is being revised for regional factors and adopted by states and school districts across the country.
- **Green Points Rating System.** Green Points exceeds the 2005 California Energy Code Title 24 by 15%. Build It Green/Green Points is a membership supported non-profit organization used by jurisdictions as a mandatory or voluntary third-party certification program. Numerous jurisdictions throughout California have adopted it. In **Santa Clara County**, for example, the system is mandatory for all homes above 1,200 ft<sup>2</sup> that are not LEED for Homes.
- **National Association of Home Builders (NAHB) Green Guidelines.** The guidelines are 15-40% above 2003 IECC or local code. First published in 2005, the NAHB Model Green Home Building Guidelines were written by a group of builders, researchers, environmental experts, and designers to provide guidance for builders engaged in or interested in green building products and practices for residential design, development, and construction. The guidelines were also written to serve as a “baseline” so that NAHB members could easily develop local programs. Local jurisdictions and utilities promote the program and provide verification, such as in **Pierce County, Washington**.
- **ASHRAE Standard 189.1.** Developed in conjunction with the Illuminating Engineering Society (IES)—previously known as the Illuminating Engineering Society of North America (IESNA)—and the USGBC, ASHRAE Standard 189.1 applies to new commercial buildings and major renovation projects and addresses energy efficiency, the impact of a building on the atmosphere, sustainable sites, water use efficiency, materials and resources, and indoor environmental quality. ASHRAE Standard 189.1 was developed for inclusion into building codes.
- **LEED.** LEED for New Construction and Major Renovation requires a minimum 10% compliance beyond ASHRAE Standard 90.1-2007. Developed by the USGBC, LEED is a green building certification system, providing third-party verification addressing energy savings, water efficiency, CO<sub>2</sub> emissions reduction, improved indoor environmental quality, and stewardship of resources and sensitivity to their impacts. There is a suite of LEED programs focused on various building types or stages of occupancy. Many federal agencies, states, and local jurisdictions have mandated or encouraged LEED certification for **municipal buildings**. Local jurisdictions, such as **Rohnert Park, California** (mandatory) and **Charlotte County, Florida** (voluntary) have adopted LEED as their standard.





- International Green Construction Code.** IgCC was developed in conjunction with the American Institute of Architects (AIA) and the American Society for Testing and Materials (ASTM). IgCC is coordinated with the other ICC model codes and is intended for adoption and use with those codes. It provides criteria for site development and land use, material resource and conservation, energy efficiency and air quality, water resource conservation, indoor environmental quality, and building operation and maintenance, as well as provisions for existing buildings. The document also provides adopting agencies with a variety of provisions upon which they can base their adoption to best address their energy needs. The IgCC references ASHRAE Standard 189.1 as an acceptable path to compliance.
- ICC 700-2008 National Green Building Standard.** ICC 700-2008 exceeds the 2006 IECC by a minimum of 15%. This standard defines green building for single and multifamily homes, residential remodeling projects, and site development.



#### Outcome-Based Codes

Progressive states and jurisdictions are beginning to select outcome-based energy codes to achieve energy efficiency goals. Unlike traditional codes in which a building or home is compared to a theoretical baseline, outcome-based codes measure actual energy use once a building is occupied, commissioned, and operating. Outcome-based codes are then satisfied not only through energy-efficient design and construction, but through operational and tenant energy use as well. Resource 14 in this chapter, the New Buildings Institute (NBI), offers guidance and numerous resources on outcome-based codes, including their development and adoption.

#### RECOMMENDATIONS

It is important to select an energy code that will achieve the goals established by a specific state or jurisdiction in the most efficient way possible.

Many states choose to adopt a model energy code because they are developed by industry professionals and do not require additional state or jurisdiction resources to create.

Model energy codes should be adopted without amendments for total access to resources. For greater energy savings, consider the adoption of a green building code or beyond-code program. If a statewide green building code is not feasible, allow counties or municipalities to enforce a local green building program.

## CHAPTER 6 (Continued)

CHAPTER 6 RESOURCES	
1. Building Energy Codes 101: An Introduction	<a href="http://www.energycodes.gov/training-courses/building-energy-codes-101">www.energycodes.gov/training-courses/building-energy-codes-101</a>
2. Model ICC Adoption Policies	<a href="http://www.iccsafe.org/gr/pages/adoption-ordinances.aspx">www.iccsafe.org/gr/pages/adoption-ordinances.aspx</a>
3. ASHRAE Model Legislation	<a href="http://www.ashrae.org/file%20library/doclib/public/20081118_std90_1.pdf">www.ashrae.org/file%20library/doclib/public/20081118_std90_1.pdf</a>
4. DOE's BECP Resource Center	<a href="http://www.energycodes.gov/resource-center">www.energycodes.gov/resource-center</a>
5. To Amend or Not to Amend National Model Energy Codes and Standards	<a href="http://www.energycodes.gov/sites/default/files/documents/to_amend_or_not_amend.pdf">www.energycodes.gov/sites/default/files/documents/to_amend_or_not_amend.pdf</a>
6. Oregon Energy Code	<a href="http://www.cbs.state.or.us/bcd/programs/energy.html">www.cbs.state.or.us/bcd/programs/energy.html</a>
7. Washington State Energy Code	<a href="https://fortress.wa.gov/ga/apps/sbcc/default.aspx">https://fortress.wa.gov/ga/apps/sbcc/default.aspx</a>
8. DOE's Building Energy Codes Program Status of State Energy Codes Database	<a href="http://www.energycodes.gov/adoption/states">www.energycodes.gov/adoption/states</a>
9. ICC's Adoption Database	<a href="http://www.iccsafe.org/gr/pages/adoptions.aspx">www.iccsafe.org/gr/pages/adoptions.aspx</a>
10. BCAP Status of State Energy Codes	<a href="http://bcap-ocean.org/code-status">http://bcap-ocean.org/code-status</a>
11. Going Beyond Code: A Guide for Creating Effective Green Building Programs for Energy Efficient and Sustainable Communities	<a href="http://www.energycodes.gov/sites/default/files/documents/GoingBeyondCode.pdf">www.energycodes.gov/sites/default/files/documents/GoingBeyondCode.pdf</a>
12. USGBC List of Public Policies Adopting or Referencing LEED	<a href="http://www.usgbc.org/displaypage.aspx?CMSPageID=1852">www.usgbc.org/displaypage.aspx?CMSPageID=1852</a>
13. GBI Map of States with Laws Recognizing Green Globes	<a href="http://www.thegbi.org/green-globes/green-globes-state-acceptance-map.asp">www.thegbi.org/green-globes/green-globes-state-acceptance-map.asp</a>
14. Outcome-Based Energy Codes	<a href="http://newbuildings.org/outcome-based-energy-codes">http://newbuildings.org/outcome-based-energy-codes</a>
15. International Code Council Government Relations Code Adoption Toolkit	<a href="http://www.iccsafe.org/gr/documents/adoptiontoolkit/toolkit.pdf">www.iccsafe.org/gr/documents/adoptiontoolkit/toolkit.pdf</a>
16. OCEAN Codes and Voluntary Programs	<a href="http://energycodesocean.org/resource/codes-and-voluntary-programs">http://energycodesocean.org/resource/codes-and-voluntary-programs</a>
17. OCEAN Policy Action Tool	<a href="http://energycodesocean.org/policy-action-tool">http://energycodesocean.org/policy-action-tool</a>
18. EPA Sustainable Design and Green Building Toolkit for Local Governments	<a href="http://www.epa.gov/region4/recycle/green-building-toolkit.pdf">www.epa.gov/region4/recycle/green-building-toolkit.pdf</a>
19. Developing Green Building Programs: A Step-by-Step Guide for Local Governments by Global Green USA	<a href="http://www.globalgreen.org/docs/publication-71-1.pdf">www.globalgreen.org/docs/publication-71-1.pdf</a>

# Determine Crucial Components of the Energy Code: Scope and Applicability, Format, Adoption Date, and Effective Date

## DESCRIPTION

There are four crucial components that must be considered during the adoption process: scope and applicability, format, adoption date and effective date. The scope of a code dictates which requirements will be covered by the code while the format relates to the manner in which code requirements are presented. Based on the energy goals of a state or jurisdiction, the scope and format of a code will greatly influence which code is selected for adoption and the adoption process used. For example, if a jurisdiction wishes to include only the HVAC system in its local code, a national model code may be amended to reflect these changes or a locally developed code may be drafted.

Similarly, if a state is interested in energy savings based on how a building operates once constructed, an outcome-based or performance code would be selected over a code with a prescriptive format.

The code selected for adoption also determines which buildings will be affected by the code and



when. It is possible to choose to apply the code to specific buildings rather than all commercial and/or residential structures. Furthermore, when adopting a code, it is important to consider the ideal effective date. The date that a code is adopted and the date that same code goes into effect are often spread apart to give ample time for all practitioners to become familiar with code requirements.

### Scope and Applicability of the Code

The scope of an energy code can include attributes, components, and devices that affect the energy efficiency of a building. In most energy codes for residential buildings, the evaluation criteria are generally less comprehensive in terms of complexity than the criteria for commercial buildings. Most residential building energy codes contain requirements for:

- Building thermal envelope, including opaque envelope, fenestration, and foundations
- HVAC systems, including equipment and controls

- Service water heating systems, including equipment and controls
- Interior lighting systems.

In commercial buildings and large multifamily residential structures, the number of energy-using systems, equipment, appliances, and components is increased. As a result, most commercial building energy codes contain requirements for the following components of a commercial building:

- Building thermal envelope, including opaque envelope, fenestration, and foundations
- HVAC systems, including equipment and controls
- Service water heating systems, including equipment and controls
- Power systems such as transformers and wiring
- Lighting systems, both interior and exterior, including fixtures and controls
- Other equipment such as motors and elevators, vending machines, laundry services, commercial cooking, and process exhausts
- Renewable energy systems.

The scope of the energy code can vary widely. For example, the scope could consider just one or two building elements, virtually every component in the building, or just the energy-using components and systems on the building site. Starting from the narrowest scope, the items most likely to be covered in the scope of an energy code are products, materials, equipment, appliances, and building components that are manufactured at the national or global level and sold nationally or internationally.

Understanding the scope of a code will allow adopters to select the most appropriate code for meeting their energy goals.

**The code support infrastructure should determine which systems and building components are crucial to constructing energy-efficient buildings in regards to the specific climate zone, available material, and efficiency goals.**

Model codes may be amended to exclude unnecessary requirements or include additional requirements that are state or jurisdiction specific.

Educating stakeholders and code practitioners on the code requirements as presented in the scope of the code will build support for the adoption of an energy code. Groups or individuals that comprise the code support infrastructure are better able to provide education, encourage outreach, and spread awareness of an upcoming code adoption or update when a general understanding of code requirements is achieved.

DOE has developed detailed materials to assist states in understanding the scope and requirements of national model codes and standards. See Resources 1-7 in this chapter for more information on what tools and materials are available.

Furthermore, the adoption process and the code or standard adopted determine which buildings will be covered by the energy code. The energy code may be drafted to include all building types or specific facilities only (e.g., state-owned or state-funded buildings or private sector buildings). The Alabama State Building Code, for example, applies only to “state building and construction, schoolhouses, hotels, and moving picture theaters.”<sup>10</sup>

### Code Format

The format of an energy code determines how the provisions of an energy code are presented. From micro to macro, the code can provide specific criteria for each aspect of the building, include provisions for a specific system in the building, or cover the building as a whole. The code format can drive the scope of the code and influence which code best suits the needs of a state or jurisdiction. Energy code formats include prescriptive, component performance, total building performance, outcome-based, peak energy capacity, and alternative guidelines. For more detailed information on code format, see Resource 8 in this chapter.

### Adoption and Effective Date

Code adoption policies require states and jurisdictions to adopt or

update mandatory and voluntary energy codes. However, the point in time that the code is adopted does not necessarily coincide with when it goes into effect. In the case of voluntary adoption, the date of adoption is generally the same as the effective date because the entity making the decision to (or not to) adopt the code would logically be applying that decision immediately. An exception to this could be a large commercial property owner, lender, or other entity that could adopt the code and require compliance on a specific date a few weeks or months in the future simply to allow time to gear up for the process of ensuring compliance.

When adoption is achieved through law or regulation, there is generally a future date specified after the date of adoption at which time the code becomes effective. This can be 3 months, 6 months, or even a year. In addition, some adoptions will provide a grace period where the predecessor code can be used for a set period of time if the designer so chooses. This period of time between the adoption date and the effective date is generally part of the adoption process for several reasons.

- Buildings may be in different stages of design and construction such that switching codes on a specific date cannot work when the building planning, design, and construction process involves months if not years.
- The building design, construction, and code community need time to learn the new code.

<sup>10</sup> Alabama Building Commission Chapter 170-X-1, Section 170-X-1-.03 (e).

- Manufacturers and their distributors need time to gear up to provide products, materials, systems, and building components that meet the new code.
- Lenders, realtors, etc. need time to gear up to affect updated lending or sales programs.

Code adoption policies may also require the one-time adoption of a code or mandate a specific time period in which a state must adopt or upgrade to the latest version of a model energy code. Some states adopt or revise energy codes in concert with the publication of a new edition of model energy codes and standards, such as the ICC, International Association of Plumbing and Mechanical Officials, National Fire Protection Association codes, or ASHRAE standards. This may occur either through a legislative or regulatory process or when the state regulation or legislation cites the most recent edition, in which case the adoption may occur automatically without formal action.

The date of a new adoption and the date at which the adopted code becomes effective can also be tied to the publication date of an energy standard. For example, jurisdictions may require that a new code become effective 3 months from the publication of the model energy code. Other states may review the new editions on a case-by-case basis without a designated timeline when considering adoption.

**RECOMMENDATIONS**

It is recommended that all entities involved in the adoption of an energy code are familiarized with the scope of the code prior

to adoption to enable effective communication, education, and outreach during the adoption process. Knowing the requirements of the code prior to adoption permits code practitioners to better prepare for code modifications, thus encouraging successful code enforcement and compliance.

The format of the code should be determined based on the resources available to the state or jurisdiction and the energy goals established by the individuals involved in the code adoption process. Different formats require a higher level of resources, including time and money, to determine compliance than others. Outcome-based codes, for example, may require inspections

post-occupancy and commissioning to determine that the building energy use is in compliance with the requirements of the code. Conversely, a prescriptive code may simply require inspection during the construction phase of a project to determine compliance or the builder may be able to self-certify that the building meets the prescriptive requirements of the code.

**When determining the time at which the adopted code will go into effect, select a date that will best prepare practitioners for the code change. In the time between the adoption and effective date, encourage stakeholders and other entities to provide education and outreach.**

**CHAPTER 7 RESOURCES**

<b>1. 2012 IECC Commercial Scope and Envelope Requirements</b>	<a href="http://energycodes.gov/sites/default/files/becu/2012iecc_commercial_envelope_BECU.pdf">http://energycodes.gov/sites/default/files/becu/2012iecc_commercial_envelope_BECU.pdf</a>
<b>2. BECP Code Notes</b>	<a href="http://www.energycodes.gov/resource-center/publications?f[0]=&amp;f[1]=field_document_tyoe%3A324">www.energycodes.gov/resource-center/publications?f[0]=&amp;f[1]=field_document_tyoe%3A324</a>
<b>3. BECP Brochures</b>	<a href="http://www.energycodes.gov/resource-center/publications?f[0]=field_document_tyoe%3A15">http://www.energycodes.gov/resource-center/publications?f[0]=field_document_tyoe%3A15</a>
<b>4. BECP Research</b>	<a href="http://www.energycodes.gov/resource-center/publications">www.energycodes.gov/resource-center/publications</a>
<b>5. BECP Software and Tools</b>	<a href="http://www.energycodes.gov/compliance/">www.energycodes.gov/compliance/</a>
<b>6. Building Energy Codes Training</b>	<a href="http://www.energycodes.gov/resource-center/eLearning">www.energycodes.gov/resource-center/eLearning</a>
<b>7. BECP Resource Guides</b>	<a href="http://www.energycodes.gov/resource-center/resource-guides">www.energycodes.gov/resource-center/resource-guides</a>
<b>8. Compliance Verification Paths for Residential and Commercial Energy Codes</b>	<a href="http://www.energycodes.gov/sites/default/files/documents/compliance_verification_paths.pdf">www.energycodes.gov/sites/default/files/documents/compliance_verification_paths.pdf</a>

# Identify and Overcome the Barriers of Adoption



## DESCRIPTION

It is important for a state or jurisdiction to identify and overcome a variety of political, economic, and technical challenges when adopting a new or updating an existing energy code. Confusion throughout the adoption process and unclear adoption language are two of the most common barriers associated with code adoption. Other barriers identified by adoption advocates and stakeholders include initial cost, limited outreach and education resources, cost and availability of code support information, and state and local adoption confusion. These barriers are often resolved by amending the adoption process, providing code education, or selecting a model energy code for adoption.

## Adoption Process

The adoption process itself can be a barrier to code adoption. States without a code update process or with an irregular code update process often experience the most difficulty when adopting an energy code; adoption can be hindered

when a state or jurisdiction has to restart the adoption process for a new code during each code cycle. As such, it is beneficial to enforce an adoption process that is both clear and consistent and utilizes automatic adoption or a standardized adoption procedure. North Carolina recognized that automatic adoption enabled the state to focus more resources on code education, compliance, and enforcement (Resource 1 in this chapter). To eliminate the adoption process as a barrier to code adoption, it is important for a state or jurisdiction to establish a routine code review and update process.

## Adoption Language

Language is among the greatest barriers to code adoption. Accordingly, the language used in the pending code should be selected carefully. The inclusion of confusing or contradicting requirements will greatly impede the adoption process; instead, code requirements should be written in easy to understand, enforceable language. States often overcome this barrier by adopting model energy codes without amendments.

## Initial Cost

A common barrier to adopting or upgrading an energy code is the misconception that the building practices outlined in the code require an initial cost that is not easily offset by energy savings. It is true that there may be an initial cost for building to the energy code or renovating an existing building to meet code requirements. However, the cost is paid back through lower utility bills, and the long-term savings make energy-efficient residential and commercial buildings more affordable than those not constructed to code.

In an effort to help states overcome this barrier, both BECP and BCAP have analyzed the incremental construction costs of upgrading to more recent editions of model energy codes. *Impacts of the 2009 IECC for Residential Buildings at State Level* (Resource 2 in this chapter), a document produced by BECP, compares the requirements of the 2009 IECC with the residential code in most states as of June 2009. The document includes estimated yearly savings and the percentage of savings achieved by adoption of the 2009 IECC. These savings can be used to estimate the number of years it will take to pay back initial costs.

Similarly, BCAP has quantified the incremental construction cost of upgrading to both the 2009 and 2012 IECC (Resources 3 and 4 in this chapter). BCAP has found that moving from current practice to the 2009 IECC for new homes would result in a weighted average incremental cost of \$840.77 per new home. The annual energy savings per home would be

\$243.37 on average, meaning the simple payback for homeowners would occur in 3.45 years. When amortized over a 30-year, 20% down payment loan, the additional upfront cost on a mortgage would be significantly lower. In fact, when factoring in energy savings, the homeowner would realize net savings within the first year.<sup>11</sup>

Moving from current practice to the 2012 IECC for new homes would result in a weighted average incremental cost of \$1,494–\$2,201 per new home in the areas in for which an analysis has been completed (subject to change). The annual energy savings per home would be \$296–\$392 on average. When amortized over a 30-year, 20% down payment loan, and including energy savings, the homeowner would realize net savings within 1 to 2 years, on average.<sup>12</sup>

State-specific incremental cost analyses are available as well. Presented as two-page fact sheets, these handouts estimate the break-even point, return on investment and energy savings for each of the states. Visit the “2009 and 2012 Incremental Cost Analysis” webpages (Resources 3 and 4 in this chapter) for information specific to your state.

To overcome the first-cost barrier, it is important for code advocates and those involved with code adoption to work closely with the build community. Builders do not directly benefit from lower utility bills and are therefore less

inclined to increase first cost by implementing energy-efficient designs. Providing the build community with information they can pass on to the buyer regarding quantified savings will assist in overcoming this barrier.

#### **Limited Outreach and Education Resources**

Limited knowledge and awareness of code requirements and energy goals can be a challenge when adopting an energy code. To overcome this barrier, it is important to plan for and implement outreach and education resources for each entity involved with code adoption. This can include building new partnerships, hosting workshops and other education courses for professionals, creating video and online training, and offering assistance and guidance throughout each phase of the adoption process. Tailoring training to each specific audience will help foster an understanding of the expectations of the code prior to code adoption and after the code is in place. Advocacy groups can become involved in the education by providing briefings on technical issues.

Furthermore, it is important to educate the general public through a proactive public relations campaign. Adoption advocates should create public service announcements and promotional material to increase public awareness of the value and benefit of code changes. According to The “New Hampshire Experience” (Resource 5 in this chapter),

a successful public awareness campaign highlights energy code benefits, presents information in a memorable and edgy way, and unifies stakeholders through easily understandable and targeted outreach messages.

**Public understanding and awareness of green building code adoption is imperative. If the public and those directly impacted by the code are not educated in the issues and benefits, the negative connotations of another regulation may preclude code adoption.<sup>13</sup>**

#### **Cost and Availability of Code Support Material**

It is crucial for states and jurisdictions to provide all entities involved in code adoption, compliance, and enforcement with the appropriate code support materials. This can include access to a copy of the written code, producing compliance and enforcement guidelines, or creating tools that can be utilized to determine compliance. This can also include analysis and advocacy documents, which should be produced quickly and efficiently to encourage adoption.

The cost of developing and distributing such materials is often viewed as a barrier to the adoption of a new energy code or upgrading to an energy code with different requirements. This barrier is easily overcome when a state or jurisdiction chooses to adopt the most recent version of a model energy code without amendments. States that adopt the most recent version of a model code have full access to all of the resources

<sup>11</sup> <http://energycodesocean.org/2009-iecc-incremental-cost-analysis>

<sup>12</sup> <http://energycodesocean.org/incremental-cost-analysis>

<sup>13</sup> [www.costar.com/uploadedFiles/JOSRE/JournalPdfs/10.192\\_210.pdf](http://www.costar.com/uploadedFiles/JOSRE/JournalPdfs/10.192_210.pdf)

## CHAPTER 8 (Continued)

available through BECP including code notes and compliance software such as REScheck™ and COMcheck™. These resources are available to states at no cost.

### State and Local Adoption Confusion

In general, it is easier to manage the adoption process and the adopted code when it is done at the state level. When possible, codes should be adopted and

made mandatory statewide. Statewide adoption ensures that there is a level of uniformity among architects, builders, contractors, and code officials throughout the state. At the municipal/county level, confusion about whether an energy code is voluntary or mandatory can be a barrier to adoption. To alleviate confusion, require local adoption and enforcement. Allow jurisdictions to set mandatory limits beyond the state energy code.

### RECOMMENDATIONS

Recommendations for overcoming each of the barriers listed above are included within the respective write-up for each barrier.

**A number of states or state organizations have undergone comprehensive studies on the barriers to the code adoption process for a particular state. See Resources 4-8 for more information on state-specific barriers.**

### CHAPTER 8 RESOURCES

1. NC Code Adoption Process: Recommendations for Possible Improvements	<a href="http://www.mathisconsulting.com/storage/NC%20Code%20Adoption%20Process%20Recommendations%20electronic.pdf">www.mathisconsulting.com/storage/NC%20Code%20Adoption%20Process%20Recommendations%20electronic.pdf</a>
2. Impacts of the 2009 IECC for Residential Buildings at State Level	<a href="http://www.energycodes.gov/sites/default/files/documents/IECC2009_Residential_Nationwide_Analysis.pdf">www.energycodes.gov/sites/default/files/documents/IECC2009_Residential_Nationwide_Analysis.pdf</a>
3. Incremental Cost Analysis	<a href="http://energycodesocean.org/incremental-cost-analysis">http://energycodesocean.org/incremental-cost-analysis</a>
4. 2009 IECC Incremental Cost Analysis	<a href="http://energycodesocean.org/2009-iecc-incremental-cost-analysis">http://energycodesocean.org/2009-iecc-incremental-cost-analysis</a>
5. The New Hampshire Experience	<a href="http://www.nhenergycode.com/live/presentations/AESP%20-%20NH%20Energy%20Code%20Presentation%20FINAL.pdf">www.nhenergycode.com/live/presentations/AESP%20-%20NH%20Energy%20Code%20Presentation%20FINAL.pdf</a>
6. Notes on Midwest Energy Efficiency Alliance Regional Building Energy Codes Conference	<a href="http://www.mwalliance.org/sites/default/files/uploads/MEEA_2010_Midwest%20Regional%20Codes%20Conference%20Notes.pdf">www.mwalliance.org/sites/default/files/uploads/MEEA_2010_Midwest%20Regional%20Codes%20Conference%20Notes.pdf</a>
7. Building Energy Codes Working Group Blueprint	<a href="http://www1.eere.energy.gov/seeaction/pdfs/buildingcodes_blueprint.pdf">www1.eere.energy.gov/seeaction/pdfs/buildingcodes_blueprint.pdf</a>
8. Building Energy Codes—Getting to the Savings	<a href="http://www.nga.org/files/live/sites/NGA/files/pdf/0805CLEANPOWERKHAN.PDF;jsessionid=D19EE70E5400A73C2F4C6AC2C58D4526">www.nga.org/files/live/sites/NGA/files/pdf/0805CLEANPOWERKHAN.PDF;jsessionid=D19EE70E5400A73C2F4C6AC2C58D4526</a>
9. To Amend or Not to Amend National Model Energy Codes and Standards	<a href="http://www.energycodes.gov/sites/default/files/documents/to_amend_or_not_amend.pdf">www.energycodes.gov/sites/default/files/documents/to_amend_or_not_amend.pdf</a>
10. New Hampshire Gap Analysis	<a href="http://www.nhenergycode.com/live/code_docs/New-Hampshire-Gap-Analysis-Report.pdf">www.nhenergycode.com/live/code_docs/New-Hampshire-Gap-Analysis-Report.pdf</a>



# Outline Who is Responsible for Satisfying What is Adopted

## DESCRIPTION

A critical step in the energy code adoption process is outlining who is responsible for satisfying what is adopted. A well-written energy code will include the role that each entity has in ensuring the adopted code is carried out. This includes specific instructions for the design and build communities, including architects and contractors, as well as those involved in validating that a home or building complies with the adopted code. The energy code should specify who will determine compliance, the time at which compliance is determined, and the appropriate method for determining compliance.

While this is more relevant to the compliance and enforcement communities, including these elements and having a clear plan for how the energy code will be carried out will encourage buy-in from stakeholders and engage all critical industry professionals in the adoption process. For more detailed information on specific compliance and enforcement issues, see the compliance and enforcement toolkits developed by BECP (Resources 1 and 2 of this chapter).

## RECOMMENDATIONS

Include specific instructions on who will determine compliance. Code officials, builders, designers, lenders, insurance underwriters, realtors, and utilities are all possible candidates for assessing, verifying, and documenting compliance with the code. For more information on how these entities can be used to verify code compliance, see Resource 3 of this chapter, “Compliance Verification Paths for Residential and Commercial Energy Codes.”

Specify when compliance will be determined. There are several possible touch points during the life of a building that are relevant to compliance with an adopted code. The earliest point is when components that will be used in a building are designed, constructed, tested, certified, labeled, and shipped for sale; the last point occurs long after the building is occupied.

Between these two points, compliance could be assessed at initial design, during preparation of the final design and specifications, during construction, at the completion of construction concurrent with pre-occupancy commissioning, and at any time after initial occupancy.



## CHAPTER 9 (Continued)

Once a certificate of occupancy has been issued and a project becomes an existing building, any alterations, additions, repairs, renovations, remodeling, or changes in occupancy or use of the building can necessitate additional energy code compliance activities. During the life of a commercial building, these changes may occur many times. As such, an assessment of compliance with the energy code for all or portions of the building may occur many times as well.

Outline the methods that will be used to determine compliance with the adopted code. Depending on the individual and collective provisions of an energy code and the format used to present the provisions, compliance verification methods may include: testing, simulation, surveillance, inspection, auditing, certification, registration, and accreditation. Detailed discussion on these methods can be found in Resource 3 of this chapter.

Invest in a code compliance assessment. The building code council (or similar group) should engage in a study of compliance with the state's energy code provisions. No compliance goal can be reasonably met without developing appropriate techniques and metrics for compliance assessment.

Promote code compliance locally. The State Energy Office (SEO) has regional representatives that assist with regional projects and objectives.

In the spirit of “Train the Trainer,” the building code council and SEO could develop a pool of local experts and resources to assist with code education and compliance.

The notion of an experienced “energy circuit rider” could assist

builders, building inspectors and others in the building industry with code education and compliance. The SEO could also engage the state's community colleges in this regional support task.

**TRAIN the Trainer**

Presented by Building Energy Codes  
Sponsored by Wyoming Business Council State Energy Office and Southeast Energy Efficiency Project (SWEEP)

Learn about the latest energy codes and standards.  
**May 2, 3 & 4, 2012 Little America Hotel**  
2800 West Lincolnway • Cheyenne, Wyoming 82009

This year's event will be held from May 2-4, 2012 in Cheyenne, Wyoming and is presented by U.S. Department of Energy's Building Energy Codes Program, sponsored by the Wyoming Business Council State Energy Office.

**DAY 1: Residential**  
The course will cover the residential provisions of the 2009 IECC and highlight changes that occur in the 2012 IECC. Topics include:  
• Scope and Application Requirements  
• Building Envelope Requirements  
• Water Heating Requirements  
• Lighting Requirements  
• REScheck

**DAY 2: Commercial (General)**  
The course will cover the commercial requirements of the 2009 IECC and ASHRAE 90.1-2007 as they relate to simple buildings. Changes that appear in the 2012 IECC and ASHRAE 90.1-2010 will also be highlighted when appropriate. The definition of simple building includes loose construction with packaged, single zone HVAC systems. The course will cover:  
• Scope and Application Requirements  
• Building Envelope Requirements  
• HVAC Requirements  
• Water Heating Requirements  
• Lighting Requirements  
• CONclude

**DAY 3: Commercial (Specialty)**  
The course will cover the commercial requirements of the 2009 IECC and ASHRAE 90.1-2007 as they relate to complex buildings. Changes that appear in the 2012 IECC and ASHRAE 90.1-2010 will also be highlighted when appropriate. The definition of complex building includes loose buildings with complex mechanical systems. The course will cover:  
• Advanced envelope requirements for the 2012 IECC and ASHRAE 90.1-2010  
• Complex Mechanical systems

WHO SHOULD ATTEND?  
The intent of this training is to teach you how to train others on the energy codes. You should be familiar with the energy code and have the desire to advance your skills as a trainer.

To attend the training and/or to be added to the email distribution list for this event's announcements, please contact:  
J.C. Martel, LEED AP, Buildings Program Associate  
Southeast Energy Efficiency Project (SWEEP)  
303-947-2652 • jmartel@seenergy.org

ENERGY Energy Efficiency & Renewable Energy  
SPACE IS LIMITED  
Building Energy Codes

### CHAPTER 9 RESOURCES

1. ACE Compliance Toolkit	<a href="http://www.energycodes.gov/resource-center/ace/compliance">www.energycodes.gov/resource-center/ace/compliance</a>
2. ACE Enforcement Toolkit	<a href="http://www.energycodes.gov/resource-center/ace/enforcement">www.energycodes.gov/resource-center/ace/enforcement</a>
3. Compliance Verification Paths for Residential and Commercial Energy Codes	<a href="http://www.energycodes.gov/sites/default/files/documents/compliance_verification_paths.pdf">www.energycodes.gov/sites/default/files/documents/compliance_verification_paths.pdf</a>
4. State Compliance, Implementation, and Enforcement Guide (Iowa example)	<a href="http://www.energycodes.gov/sites/default/files/documents/IA_cie_guide.pdf">www.energycodes.gov/sites/default/files/documents/IA_cie_guide.pdf</a>

# Receive Assistance on Energy Code and Adoption Questions

## CHAPTER 10

### **Building Energy Codes Program (BCEP)**

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

BCEP is an information resource on national energy codes and green building programs. BCEP works 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.

### **Building Codes Assistance Project (BCAP)**

[www.bcap-ocean.org](http://www.bcap-ocean.org)

BCAP is an initiative of the Alliance to Save Energy, the American Council for an Energy-Efficient Economy (ACEEE), and the Natural Resources Defense Council that provides states with code advocacy assistance on behalf of DOE.

### **International Code Council (ICC)**

[www.iccsafe.org](http://www.iccsafe.org)

The ICC is a membership association dedicated to building safety and fire prevention. ICC develops the codes and standards used to construct residential and commercial buildings, including homes and schools. ICC is the publisher of the IECC, the National Green Building Standard, and the IgCC. The ICC is a resource for code books and training and has local chapters that are active in most states.

### **American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE)**

[www.ashrae.org](http://www.ashrae.org)

ASHRAE is an international membership organization for advancing HVAC and refrigeration through research, standards

writing, publishing, and continuing education. ASHRAE is a resource for standards, education, research, and training. Local chapters are active throughout the country. ASHRAE is the publisher of Standards 90.1 and 189.1.

### **American Council for an Energy-Efficient Economy (ACEEE)**

[www.aceee.org](http://www.aceee.org)

ACEEE is a non-profit, 501(c)(3) organization dedicated to advancing energy efficiency as a means of promoting economic prosperity, energy security, and environmental protection. Projects are carried out by ACEEE staff and collaborators from government, the private sector, research institutions, and other non-profit organizations.

### **Building Technologies Program (BTP)**

[www1.eere.energy.gov/buildings](http://www1.eere.energy.gov/buildings)

DOE's BTP works to secure America's future with energy-efficient buildings by working with a network of research and industry partners to develop innovative, cost-effective energy solutions for buildings.

### **Building America**

[www1.eere.energy.gov/buildings/building\\_america/about.html](http://www1.eere.energy.gov/buildings/building_america/about.html)

Building America is an industry-driven, cost-shared research program working with national laboratories and building science research teams to accelerate the development and adoption of advanced building energy technologies and practices in new and existing homes. The program works closely with industry partners to develop innovative, real-world solutions that achieve

significant energy and cost savings for homeowners and builders.

### **American Recovery and Reinvestment Act of 2009 (ARRA)**

[www.recovery.gov/Pages/default.aspx](http://www.recovery.gov/Pages/default.aspx)

ARRA is an economic stimulus bill with three immediate goals: create new jobs and save existing ones, spur economic activity and invest in long-term growth, and foster unprecedented levels of accountability and transparency in government spending.

### **Southwest Energy Efficiency Project (SWEET)**

[www.swenergy.org](http://www.swenergy.org)

SWEET is a regional non-profit organization that promotes greater energy efficiency in a six-state region that includes Arizona, Colorado, Nevada, New Mexico, Utah, and Wyoming and facilitates regional partnerships. SWEET programs include buildings and energy codes, utilities, transportation, industrial efficiency, and combined heat and power.

### **Northeast Energy Efficiency Partnerships (NEEP)**

[www.neep.org](http://www.neep.org)

NEEP is a regional non-profit organization that facilitates regional partnerships to advance the efficient use of energy in homes, buildings, and industry in the northeast states of Connecticut, Maine, Massachusetts, New Hampshire, New Jersey, New York, Rhode Island and Vermont, and the mid-Atlantic states of Pennsylvania, Delaware, Maryland, and Washington, D.C.

**Midwest Energy Efficiency Alliance (MEEA)**

[www.mwalliance.org](http://www.mwalliance.org)

MEEA is a regional non-profit organization that facilitates regional partnerships. As a central source for information and action, MEEA raises awareness, facilitates energy efficiency programs, and strengthens policy across the Midwest region, including the states of Illinois, Indiana, Iowa, Kansas, Kentucky, Michigan, Minnesota, Missouri, Nebraska, North Dakota, Ohio, South Dakota, and Wisconsin.

**Northwest Energy Efficiency Alliance (NEEA)**

[www.nwalliance.org](http://www.nwalliance.org)

NEEA is a regional non-profit organization that facilitates regional partnerships. NEEA's mission is to mobilize the Pacific Northwest to become increasingly energy efficient for a sustainable future. NEEA works with the states of Washington, Idaho, Montana, and Oregon.

**Southeast Energy Efficiency Alliance (SEEA)**

[www.seealliance.org](http://www.seealliance.org)

SEEA is a regional non-profit organization that facilitates regional partnerships to promote and achieve energy efficiency through networking, program activities, and education. SEEA is active in Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Mississippi, North Carolina, South Carolina, Tennessee, and Virginia.

**National Institute of Building Science's Whole Building Design Guide**

[www.wbdg.org](http://www.wbdg.org)

This website provides significant guidance on integrated design and specific design elements for the whole building.

**National Association of Home Builders (NAHB) Research Center**

[www.toolbase.org/index.aspx](http://www.toolbase.org/index.aspx)

The NAHB Research Center's TOOLBASE.ORG website is a resource for technical information on building products, materials, new technologies, business management, and housing systems.

**U.S. Green Building Council (USGBC)**

[www.usgbc.org](http://www.usgbc.org)

USGBC is a non-profit organization responsible for LEED, the internationally recognized green building certification system. LEED provides building owners and operators with a framework for identifying and implementing practical and measurable green building design, construction, operations, and maintenance solutions. The LEED rating systems are developed through an open, consensus-based process led by LEED committees, diverse groups of volunteers representing a cross-section of the building and construction industry. Key elements of the process include a balanced and transparent committee structure, technical advisory groups that ensure scientific consistency and rigor, opportunities for stakeholder comment and review, member ballot of new rating systems, and fair and open appeals.

The USGBC website provides research on a wide range of topics related to sustainable construction and development, not limited to those associated with LEED.

**New Buildings Institute (NBI)**

[www.newbuildings.org](http://www.newbuildings.org)

[www.advancedbuildings.org](http://www.advancedbuildings.org)

NBI is a non-profit organization working to improve the energy performance of commercial buildings. NBI works collaboratively with commercial building market players—governments, utilities, energy efficiency advocates, and building professionals—to remove barriers to energy efficiency, including promoting advanced design practices, improved technologies, public policies, and programs that improve energy efficiency.

NBI, in partnership with Advanced Buildings, publishes the Core Performance Guide. Core Performance is a direct, simplified approach to achieve predictable energy savings in small- to medium-sized buildings without the need for modeling. Core Performance brings together over 30 criteria defining high performance in building envelope, lighting, HVAC, power systems, and controls. With its well-organized and easy-to-use guide, building design and construction professionals gain access to quantitative and descriptive specifications for exceeding state and national energy standards such as ASHRAE Standard 90.1-2007 by up to 25%.

**American Institute of Architects (AIA)**[www.aia.org](http://www.aia.org)

AIA is a professional membership association for licensed architects and serves as the voice of the architecture profession. The AIA achieves its goals of advocacy, information, and community by sponsoring continuing education experiences, setting industry standards in contract documents, providing web-based resources for emerging professionals, and conducting market research and analysis, among others.

**Associated General Contractors of America (AGC)**[www.agc.org](http://www.agc.org)

AGC is the leading association in the construction industry. AGC provides a full range of services satisfying the needs and concerns of its members, thereby improving the quality of construction and protecting the public interest.

**Building Owners and Managers Association (BOMA)**[www.boma.org/Pages/default.aspx](http://www.boma.org/Pages/default.aspx)

BOMA is an international federation of more than 100 local associations and affiliated organizations whose mission is to enhance the human, intellectual and physical assets of the commercial real estate industry through advocacy, education, research, standards and information. BOMA International is a primary source of information on building management and operations, development, leasing, building operating costs, energy consumption patterns, local and national building codes, legislation, occupancy statistics, technological developments and other industry trends.

**Construction Specifications Institute (CSI)**[www.csinet.org](http://www.csinet.org)

CSI is a national association comprising volunteers, including specifiers, architects, engineers, contractors, facility managers, product representatives, manufacturers, owners and others who are experts in building construction and materials. CSI is dedicated to improving the communication of construction information through a diversified membership base of construction professionals, continuous development and transformation of standards and formats, education and certification of professionals, and the creation of practice tools to assist users throughout the facility life-cycle.

**Illuminating Engineering Society (IES)**[www.iesna.org](http://www.iesna.org)

IES, formerly the Illuminating Engineering Society of North America (IESNA), is the recognized technical authority on illumination. The objective of IES is to communicate information on all aspects of good lighting practice to its members, to the lighting community, and to consumers through a variety of programs, publications, and services. IES is a forum for the exchange of ideas and information, and a vehicle for its members' professional development and recognition. Through technical committees, with hundreds of qualified individuals from the lighting and user communities, IES correlates

research, investigations, and discussions to guide lighting professionals and lay persons via consensus-based lighting recommendations.

**National Association of State Energy Officials (NASEO)**[www.naseo.org/about/index.html](http://www.naseo.org/about/index.html)

NASEO is a non-profit organization comprising the governor-designated energy officials from each state and territory. The organization was created to improve the effectiveness and quality of state energy programs and policies, provide policy input and analysis, share successes among the states, and to be a repository of information on issues of particular concern to the states and their citizens.

**National Association of State Fire Marshals (NASFM)**[www.firemarshals.org](http://www.firemarshals.org)

NASFM is a non-profit association of senior fire officials throughout the United States. While the Fire Marshals' responsibilities vary from state to state, most Marshals tend to be responsible for fire safety code adoption and enforcement, fire and arson investigation, fire incident data reporting and analysis, public education and advising governors and state legislatures on fire protection.

### **National Governors Association (NGA)**

[www.nga.org/cms/home.html](http://www.nga.org/cms/home.html)

NGA is a bipartisan organization of the nation's governors that promotes visionary state leadership, shares best practices, and speaks with a collective voice on national policy. Through NGA, governors identify priority issues and deal collectively with matters of public policy and governance at the state and national levels.

### **National Institute of Building Sciences (NIBS)**

[www.nibs.org](http://www.nibs.org)

NIBS is a non-profit, non-governmental organization bringing together representatives of government, the professions, industry, labor and consumer interests to focus on the identification and resolution of problems and potential problems that hamper the construction of safe, affordable structures for housing, commerce and industry throughout the United States. The Institute provides an authoritative source of advice for both the private and public sectors of the economy with respect to the use of building science and technology. Congress recognized that the lack of such an authoritative voice was a burden on all those who plan, design, procure, construct, use, operate, maintain and retire physical facilities, and that this burden frequently resulted from failure to take full advantage of new useful technology that could improve our living environment.

### **National Multi Housing Council (NMHC)**

[www.nmhc.org](http://www.nmhc.org)

NMHC serves as the apartment industry's primary advocate on legislative and regulatory matters. The Council conducts apartment-related research, produces strategic information on business-related issues, and promotes the desirability of apartment living. NMHC actively helps shape legislation and regulations that affect the industry and concentrates on public policies that are of strategic importance to participants in multifamily housing, including housing and finance, tax, technology, property management, environmental and building codes.

### **Responsible Energy Codes Alliance (RECA)**

[www.reca-codes.org](http://www.reca-codes.org)

RECA is an organization that believes that a single nationwide building energy efficiency code is in the best interest of building and homeowners, operators and builders, manufacturers, and the general public welfare. The primary mission of RECA is to promote the adoption, implementation, and enforcement of the most recent version of the IECC nationwide.

NOTES

U.S. DEPARTMENT OF  
**ENERGY** | Energy Efficiency &  
Renewable Energy

**BUILDING TECHNOLOGIES PROGRAM**

**ACE**

LEARNING SERIES

**ADOPTION,  
COMPLIANCE  
& ENFORCEMENT**

# Building Energy Codes **ADOPTION TOOLKIT**

**EERE Information Center**

**1-877-EERE-INFO (1-877-337-3463)**

*[www.eere.energy.gov/informationcenter](http://www.eere.energy.gov/informationcenter)*

September 2012

PNNL-SA-89963

For information on Building Energy Codes,  
visit [www.energycodes.gov](http://www.energycodes.gov)



**Building Energy Codes**