West Virginia Gap Analysis

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BCAP Compliance Planning Assistance Program

WEST VIRGINIA DIVISION OF ENERGY

Prepared by the Building Codes Assistance Project and the West Virginia Division of Energy for the United States Department of Energy
Building Codes Assistance Project (BCAP)

BCAP is a non-profit advocacy organization established in 1994 as a joint initiative of the Alliance to Save Energy, the American Council for an Energy-Efficient Economy, and the Natural Resources Defense Council. BCAP focuses on providing state and local governments in the U.S., as well as stakeholder organizations, with support on code adoption and implementation through direct assistance, research, data analysis, and coordination with other activities and allies. With over sixteen years of experience supporting numerous state energy offices and city building departments, along with tracking code activities across the country, BCAP is well-positioned to assist in local and statewide activity to advance codes. As a trusted resource, BCAP is able to identify and navigate past policy and programmatic pitfalls to help states and jurisdictions put the best possible strategy in place to improve efficiency in both new and existing buildings. Our work pulls together local efforts, identifies national-scale issues, and provides a broad perspective, unbiased by corporate/material interests. BCAP also hosts OCEAN—an online international best practice network for energy codes—and is increasingly working abroad to gather and share best practices that provide value across organizations.
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Acronyms and Abbreviations

ASHRAE – American Society of Heating, Refrigerating, and Air-Conditioning Engineers
BCAP – Building Codes Assistance Project
BPI – Building Performance Institute
CEUs – Continuing education units
DOE – Department of Energy
ECAP – Energy Code Ambassadors Program
EEBA – Energy & Environmental Building Alliance
EECBG – Energy Efficiency and Conservation Block Grants
EPA – U.S. Environmental Protection Agency
HERS – Home Energy Rating System
IBC – International Building Code
ICC – International Code Council
IECC – International Energy Conservation Code
IRC – International Residential Code
LEED – Leadership in Energy and Environmental Design
MEC – Model Energy Code
NAHB – National Association of Home Builders
OCEAN – Online Code Environment and Advocacy Network
PDHs – Professional Development Hours
PDUs – Professional Development Units
PNNL – Pacific Northwest National Laboratory
RECA – Responsible Energy Codes Alliance
RESNET – Residential Energy Services Network
SEO – State Energy Office
SEP – State Energy Program
USGBC – U.S. Green Building Council
The Executive Summary

The purpose of the West Virginia Gap Analysis Report is twofold: 1) document and analyze the strengths and weaknesses of the state’s existing energy code adoption and implementation infrastructure and policies; 2) recommend potential actions state agencies, local jurisdictions, and other stakeholders can take to achieve 100 percent compliance with the model energy codes. The report is organized into four sections: Introduction, Adoption, Implementation, and Conclusion. The Adoption and Implementation sections both conclude by listing some of the state’s current best practices and making multiple recommendations for actions that would improve energy code compliance.

The introduction of the report provides an overview of West Virginia important demographic and economic indicators, including important population centers, population growth, construction activity and energy consumption. This section also introduces the possible energy and financial savings available to owners and occupants of both single family residential and commercial buildings, should the state adopt the latest model codes, the 2009 International Energy Conservation Code (IECC) and the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) Standard 90.1-2007 for residential and commercial buildings, respectively.

The Adoption section examines federal, state, and local policies that influence energy codes in the state. The section examines the purview of state agencies, including the Division of Energy. As the state has created a minimum building energy code, this report recommends that the state take additional actions to ensure its enforcement at the local level. As well, the Adoption section recommends that the state move forward to adopt the 2009 IECC and achieve building energy efficiency improvements through other means, including incentives and green building initiatives launched at the local level.

The implementation section of the report describes the activities taken by state and local government officials, including code inspectors, to ensure compliance with the energy code. This section of the report also explores the building inspections process at the local level. As well, the section identifies common code-related challenges and areas for improvement. The report also examines the requirements and training responsibilities of design and construction professionals as they relate to the energy code, including the continuing education requirements for each design specialty or trade. Among other recommendations contained in this section, the report recommends requiring energy code-specific training as part of the continuing education requirements set by the state. As well, the report recommends actions that the state can begin to take to meet the ARRA-mandated requirement that the state measure code compliance.

Finally, the report’s conclusion summarizes the benefits of energy code adoption in West Virginia and actions that can be taken to achieve improved adoption and compliance outcomes. A recommendations table following the conclusion summarizes these opportunities for easy reference. Appendix A offers a list of other DOE and Pacific Northwest National Laboratory (PNNL) energy code resources.
Introduction

Energy codes have arrived. As one of the principal instruments in the energy efficiency policy toolbox, codes benefit society in a number of important ways: they reduce energy use, which decreases greenhouse gas emissions and pollution, save consumers and businesses money, lessen peak energy demand, increase utility system reliability, and improve indoor air quality.

Recent improvements in the stringency of the model energy codes—not to mention the development of the first green codes—continue to raise the floor and ceiling for energy-efficient design and construction to levels that were almost unimaginable a few short years ago. Meanwhile, the Recovery Act has provided states and cities with unprecedented funding and incentives to adopt the model energy code, and more places are taking advantage of these opportunities than ever before.

Their ascent is part of a larger transformation in the way advocates, policymakers, industry and utility representatives, and the general public view energy efficiency as a viable and cost-effective component of a comprehensive solution to our current economic, environmental, and energy concerns. Energy efficiency is widely considered one of the lowest-hanging fruits since the cheapest and cleanest fuel source is the one we do not burn. Nowhere is this more apparent than in the building sector, which accounts for almost 40 percent of total energy use and 70 percent of electricity use.¹ Moreover, the average lifespan of a building is roughly 50 years, meaning that current building energy policies will affect energy consumption until 2060 and beyond.

Yet, for all this recent progress and promise, energy codes are still falling well short of their potential. In municipalities across the country, energy code enforcement and compliance remain woefully insufficient or completely absent. While development and adoption are the necessary first steps of the energy codes process, they alone do not guarantee compliance. To ensure that energy codes accomplish their missions to reduce energy use and save money, states and cities must develop and carry out effective and realistic energy code implementation strategies.

In collaboration with the U.S. Department of Energy, BCAP has undertaken a new program to improve energy code compliance in 15 states, including West Virginia, by analyzing the gaps in the existing energy code infrastructure and practices and providing compliance planning assistance and on-the-ground technical support to energy code stakeholders in the state. The first phase of the program is the Gap Analysis Report, which identifies barriers to successful energy code adoption and implementation, opportunities for improvement, available resources, and key stakeholders and potential partnerships.

State Overview

A rugged Mid-Atlantic state, West Virginia is considered by the U.S. Census Bureau to the part of the Southeast U.S., but it borders five states, including those of the Midwest and Northeast. The state has grown slowly over the last decade, increasing in population by 2.5% over the last decade to a total of 1,852,994 in 2010. This growth represents an increase over the preceding decade, as the state grew only 0.8% from 1,990 to 2000.² The state’s population is decentralized, and only two cities in the state,
Charleston and Huntington, exceed 50,000 residents within their borders, although the metro areas for these two cities each approach 300,000 and combined represent almost a third of residents statewide. The population density mirrors that of the U.S. as a whole, with 75.1 persons per square mile, compared to 79.6 nationally.

**Figure 1, State Population Map**

**Construction Overview**

Like other states throughout the U.S., construction in West Virginia has declined significantly as a result of the downturn in the real estate market. New single family home construction has been especially hard-hit, declining from a peak of 5,399 new starts in 2005 to 1,966 starts in 2009 – a decrease of nearly 64%. Anecdotally, a portion of the construction decrease has been attributed to a decline in exurban housing developments on the western edge of the Washington, DC region. Said one code official: “In the boom times we were one of the fastest growing [counties] in the country, but since the crash we’re doing almost nothing. Remodels are not down as much—tiny additions and decks are still happening, but new homes and commercial is pretty much dead. Builders are going out of business.” Added another official: most of the growth in the state is in the panhandle—Martinsburg, Morgantown. We’ve seen lots of remodeling in the last two years...lots [of owners are] doing work themselves.”
Even though the decline in residential and commercial construction has been detrimental to the state economy, it presents a unique opportunity for the advancement of energy codes in the state. With workloads reduced, some building professionals and code officials should have more time to take advantage of available energy code training. Reduced construction will also help ease all stakeholders into the new code, rather than trying to adjust while construction is high.

*Figure 2 – Permits by Year*

**West Virginia Permits by Year**

US Census Bureau data

<table>
<thead>
<tr>
<th>Year</th>
<th>Total Residential Housing Units Permitted</th>
</tr>
</thead>
<tbody>
<tr>
<td>2000</td>
<td>6,000</td>
</tr>
<tr>
<td>2001</td>
<td>5,000</td>
</tr>
<tr>
<td>2002</td>
<td>4,000</td>
</tr>
<tr>
<td>2003</td>
<td>4,000</td>
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<tr>
<td>2004</td>
<td>5,000</td>
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<td>2005</td>
<td>6,000</td>
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<tr>
<td>2006</td>
<td>5,000</td>
</tr>
<tr>
<td>2007</td>
<td>4,000</td>
</tr>
<tr>
<td>2008</td>
<td>3,000</td>
</tr>
<tr>
<td>2009</td>
<td>2,000</td>
</tr>
</tbody>
</table>

**Energy Portfolio**

West Virginia is the largest coal producing state east of the Mississippi River and second in the nation (after Wyoming). The state accounts for one-tenth of the entire country’s coal production and is the fourth ranked state in total energy production. Much of this energy is sold in other states, as West Virginia ranks second in the nation for interstate sales of electricity. The vast majority of electricity produced in the state comes from coal, although petroleum, natural gas, nuclear, and hydroelectric are also used. The state’s high dependence on coal, low energy prices, and high per capita energy use place it in the top ten for highest carbon dioxide emissions from the electric power industry. Residential electricity rates in the state are among the lowest in the country. In September 2010, the statewide rate was 43rd nationally among 50 states at only 9.28 cents/kWh.
Reducing overall energy use through the adoption and implementation of the model energy codes would allow West Virginia to conserve its fossil fuels reserves. By reducing energy use, the state will forestall the need to add additional fossil fuel-based energy production and reserve electrical generation for export. In the long-term, reducing building energy use would also allow the state to achieve its goals for greenhouse gas emissions reduction.3

**Potential Savings from Energy Codes**

According to BCAP estimates, if West Virginia began implementing the 2009 International Energy Conservation Code (IECC) and Standard 90.1-2007 statewide in 2011, businesses and homeowners could save an estimated $16 million annually by 2020 and $32 million annually by 2030 in energy costs (assuming 2006 prices). Additionally, mandatory implementation of the latest model codes would help avoid about 5.2 trillion Btu of primary annual energy use by 2030 and annual emissions of more than 368 thousand metric tons of CO2 by 2030.

The following table represents a percentage of potential energy savings that can be achieved by adopting the most up to date ASHRAE 90.1-2007 building energy standard. In the table below Non Residential represents mid rise commercial buildings, Residential represents high rise residential buildings and Semi Heated represents commercial warehouses. 100 percent compliance with Standard 90.1-2007 would result in up to a 5.4 percent savings in commercial energy costs.

<table>
<thead>
<tr>
<th>Construction Type</th>
<th>City</th>
<th>Energy Savings</th>
<th>Cost Savings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non Residential</td>
<td>Charleston</td>
<td>3.9%</td>
<td>3.4%</td>
</tr>
<tr>
<td>Residential</td>
<td>Charleston</td>
<td>6.6%</td>
<td>3.9%</td>
</tr>
<tr>
<td>Semi Heated</td>
<td>Charleston</td>
<td>0.6%</td>
<td>0.4%</td>
</tr>
<tr>
<td>Non Residential</td>
<td>Elkins</td>
<td>5.5%</td>
<td>5.4%</td>
</tr>
<tr>
<td>Residential</td>
<td>Elkins</td>
<td>6.7%</td>
<td>4.0%</td>
</tr>
<tr>
<td>Semi Heated</td>
<td>Elkins</td>
<td>0.4%</td>
<td>0.3%</td>
</tr>
</tbody>
</table>

Source: [Impacts of Standard 90.1-2007 for Commercial Buildings at State Level](https://www.energy.gov), U.S. Department of Energy

**Adoption**

**Federal Policy**

Although energy code adoption occurs on the state and local levels, the federal government—through Congress and the U.S. Department of Energy (DOE)—has played a significant role in advancing energy code development, determining the relative effectiveness of national model energy codes, and supporting state- and local-level adoption and implementation.
What's required by the IECC?

- Depending on your location (climate zone) there are requirements for insulating ceilings, walls, and sometimes, floors, foundations, basement walls, and slab edge
- Less insulation is allowed for mass walls, and more is required for steel framing
- Also dependant on climate zone, there are requirements for windows, skylights, and doors
- The building shell, also known as the building envelope, must be caulked and sealed to limit air movement
- Duct insulation
- Pipe insulation
- Duct sealing to reduce air leakage
- Heating, ventilation, air conditioning (HVAC) and water heating equipment efficiencies and control requirements for commercial buildings
- Some residential lighting requirements
- All commercial lighting
- Heated swimming pool covers and controls
- The energy code applies to all new residential and commercial buildings, as well as additions/alterations/renovations to existing buildings
- Compliance paths include prescriptive, total building envelope UA (tradeoff method), and simulated performance

EPAct

The Energy Policy Act (EPAct) of 1992 required DOE to determine whether the most current model energy codes would improve energy efficiency for residential and commercial buildings. It also mandated that the DOE make a new determination within twelve months for every subsequent revision of these codes. Each state would then have two years to certify that it had revised its own energy code to meet or exceed the requirements of the latest iteration of the national models. A state could decline to adopt a residential energy code by submitting a statement to the Secretary of the DOE detailing its reasons for doing so. The Energy Policy Act of 2005 specified that the most current model energy codes were the 2004 supplement to the 2003 IECC and ASHRAE Standard 90.1-2004.

At the end of 2008, the DOE published its determination for ASHRAE Standard 90.1-2004 for commercial buildings, ruling that energy savings above the previous Standard 90.1-1999 would be 13.9 percent for national source energy and 11.9 percent for building energy consumption. DOE is currently reviewing Standard 90.1-2007, the most recent national model energy code for commercial buildings. For residential and small commercial, the last DOE determination was for the 2000 IECC. At present, DOE is reviewing the 2003, 2006, and 2009 versions of the code.

As West Virginia has adopted the 2003 IECC, the state is in compliance with the residential requirements of EPAct. However, the current commercial code, the 2003 IECC, does not meet the commercial code threshold required by EPAct, as the stringency of code falls short of the 2004 IECC and ASHRAE 901.-2004.

The Recovery Act

In 2009, Congress passed the American Recovery and Reinvestment Act (Recovery Act), which provided states with stimulus funds through the State Energy Program (SEP) and the Energy Efficiency and Conservation Block Grants (EECBG) to adopt the 2009 IECC or equivalent for residential construction and the ASHRAE Standard 90.1-2007 or equivalent for commercial construction, as well as achieve 90 percent compliance with the codes by 2017. In a letter dated February 24, 2009, then-Governor Manchin assured that he would communicate to the public utility commission that they adopt regulations consistent with ARRA.
requirements. In response, DOE awarded the state $32.7 million in SEP funding for use in energy efficiency policies and improvements and an additional $14 million EECBG formula grant. The majority of formula grant dollars were allocated to making energy efficiency improvements in city halls and county courthouses. To distribute funds, money was allocated by population to the state’s 11 Regional Planning and Development Councils, which in turn made awards to local cities and counties.

**State Policy**

In the United States, building energy codes are adopted on the state and local levels. This is due, in part, to the diverse range of cultures and climates found across the fifty states, as well as a host of historical political influences that shaped federal-state and state-local relations. The process differs from state to state, but in most cases codes are adopted through a legislative process, a regulatory process, or a combination of both, as in West Virginia, which has attributes of both the legislative and regulatory process. In West Virginia, the State Fire Commission is responsible for adopting, promulgating, and amending the statewide construction codes, although the Administrative Procedures Act requires public hearings on the adoption of all codes by the State Fire Commission.

**Political Environment and Energy Code Adoption**

The state’s currently adopted energy code is the 2003 IECC for residential and commercial buildings. The West Virginia State Fire Commission is responsible for managing the adoption and amendment process, which must be accompanied by public hearings. The state does not have a regular code adoption schedule, and the most recent effective update was May 2006.

On April 11, 2009, the West Virginia Legislature passed companion bills directing the State Fire Commission to promulgate rules adding the 2009 IECC and ASHRAE 90.1-2007 to the state building code. On May 7, then-Gov. Joe Manchin signed the legislation. As directed, the West Virginia State Fire Commission commenced the subsequent rulemaking process, promulgating a rule adopting the model codes with an effective date intended for the fall of 2009. A legislative review committee with oversight authority, however, chose to amend the Fire Commission’s rule to revert back to the 2003 IECC. These standards are still in effect today.

**Gap:** The state is not EPAct compliant and the state’s minimum energy code does not reach the stringency of the 2009 IECC.

**Recommendation #1:** BCAP recommends that the state adopt the 2009 IECC and ASHRAE Standard 90.1-2010 as the mandatory, statewide energy codes without weakening amendments.

**Gap:** The state does not have an automatic energy code review process on a three-year cycle.

**Recommendation #2:** The state should adopt an automatic review process for future iterations of the model energy code to lock in future energy savings and remove speculation after the release of each new model energy code.
One unique venue for energy code advancement in West Virginia are the state’s 11 Regional Planning and Development Councils, described on page 12, above. As part of their agreement with the state, each must host quarterly meetings of the West Virginia Building Energy Collaborative, a group led by the New River Community and Technical College. This group works to attract local government officials and members of the building community—bank, real estate interests, and construction professionals—in order to work out strategies on how best to implement and enforce the energy code. 

**Other West Virginia Building Codes**


**Energy Codes for State-funded Facilities**

At present the state does not have a policy in effect that stipulates energy codes standards other than those currently required statewide. However, a bill currently under consideration, SB 510, titled “Green Buildings Minimum Energy Standards Bill” would mandate compliance with the 2009 IECC and ASHRAE 90.1-2007.

**Gap:** The state does not have a mandatory green or advanced code policy for state-funded facilities.

**Recommendation #3:** West Virginia should pass legislation that mandates that all state-funded facilities meet the requirements of a recognized national green building or high performance standard or code.

**Statewide Climate Change Initiatives**

At present, West Virginia does not have a climate action plan. However, the West Virginia Department of Environmental Protection has created a mail-in rebate program to help residents replace older, inefficient appliances with efficient ENERGY STAR qualified appliances. The program will run till February 2012 or when the $1,741,000 program fund is depleted.

The West Virginia Department of Commerce also developed a State Energy Plan in 2007. The stated goal of the plan is to offset the equivalent of 1.3 billion barrels of foreign oil by the year 2030. The state has developed a three part solution to meet this goal:
enhancement of fossil fuel production, developing renewable energy systems, and improved energy efficiency. Building codes are addressed in the State Energy Plan. The plan calls for the West Virginia Division of Energy to provide code training workshops and to require local code adoption to be eligible for state infrastructure grants. A medium term goal is for the State Fire Commission to adopt updates of national codes shortly after they are issued and without amendments. The stated long term goal is the adoption of ENERGY STAR criteria for new construction statewide. The Energy Plan also deals with multiple renewable energy systems including hydroelectric and wind power. The West Virginia Division of Energy has also created a map depicting wind energy potential throughout the state to help promote renewable energy.

Also of note, the West Virginia Department of Environmental Protection is in the process of establishing a Sustainable West Virginia Program. The program has identified the following core areas: West Virginia Sustainable Communities, Sustainable Schools West Virginia, Environmental Management Systems, Pollution Prevention and I Travel Green programs. According to the state, I Travel Green is “a registration, rating, and reporting program for travel and tourism organizations that make commitments to continually improve environmental, socio-cultural, and economic performance.”

Overview of Green and Above-Code Programs

Of the 5,156 LEED certified buildings in the country, West Virginia currently has seven. For LEED registered buildings, West Virginia accounted for 33 of the national 18,029. West Virginia has only a small fraction of the LEED buildings in the region.

ENERGY STAR for Homes

ENERGY STAR for Homes is a national above-code building program started by the EPA. To qualify for the ENERGY STAR for Homes label, homes must receive a score of 85 or less on the HERS index. The EPA Energy Star Homes is another way to gage West Virginia’s green building practices. West Virginia has 169 Energy Star homes and the market penetration of the ENERGY STAR New Homes program in West Virginia stood at less than 3% in 2009.

Building America

Since 1994, the DOE’s Building America program has been raising the bar for energy efficiency and quality in new and existing homes. Working with national laboratories and the residential building industry, its goal is to improve the quality and performance of today’s homes while continually working towards net-zero energy homes. To qualify, homes must
receive a score of 70 or less on the HERS index, though the program’s innovative house-as-a-system approach can reduce a home’s average energy consumption by as much as 40 percent with little or no impact on the cost of new construction. Building America approaches have been used in more than 42,000 homes across the country to date. These homes typically sell within weeks while other new homes sit on the market for months.

Through its Builders Challenge program, new homes that meet stringent qualifications can earn an Energy Smart Home Scale label. Builders Challenge is similar to ENERGY STAR for Homes in that both programs assist and reward builders who build homes more efficiently than standard practice. However, the energy threshold requirements for the Builders Challenge program are different than those of ENERGY STAR. According to the Building America website, there are currently no homes in West Virginia being built through the Building America program. Additionally, at present there are currently no utility-funded incentives for energy efficiency.

**Gap:** The number of advanced, voluntary above code residential construction projects and energy efficiency incentives is limited.

**Recommendation #4:** The state should support additional above code work, especially by promoting Energy Star or Building America programs at the local level and engaging utility participation in rebate and incentive programs—which have proven popular and effective in other states.

**Local Policy**

Local energy code adoption varies greatly from state-to-state. In strong home rule states, local jurisdictions have full authority to adopt energy codes that best fit the needs of their community, while others must meet a statewide minimum first. On the other end, some states mandate a minimum-maximum energy code that prohibits local jurisdictions from diverging from the state code whatsoever. Most states fall somewhere in between, mandating a minimum code, but allowing some flexibility to go beyond it in progressive jurisdictions. An improved code could benefit West Virginia residents in tangible ways, some unrelated to building performance. Said one code inspector: “I don’t understand why they didn’t adopt the 2009 [IECC] other than somebody said it would cost more… [Recently], electric utilities tried to install a high-voltage line thru our area and people are opposed to it due to radiation. If we had more energy efficiency, these things might be mitigated altogether.”

**Local Adoption Challenges**

As all political jurisdictions statewide are dependent on the statewide code, no cities have adopted their own advanced “stretch” codes. Such a code would provide jurisdictions who wish to adopt a more stringent code the option of doing so – thus taking the political discussion to the local level and allowing progressive cities a chance to further enhance building practice. It is the current position of the state that jurisdictions are free to adopt stretch codes if they so choose.
Energy Codes for Municipal-funded Facilities

Like many jurisdictions across the country, Morgantown, WV has taken the step of requiring that municipal buildings achieve a higher level of energy efficiency than required by code. Begun by the Green Building Municipal Leadership Initiative in September 2006, the city now requires new or major renovation projects that were owned, managed, or operated by the city to reach LEED Certified level. Facilities under 10,000 square feet are exempted from this requirement.

By requiring stricter standards for public buildings, jurisdictions demonstrate their commitment to energy-efficient construction, create a more conducive environment for stricter energy code adoption for private construction, and give themselves leverage in negotiating with stakeholder groups that are hesitant to upgrade the baseline energy code. They also save taxpayer dollars with lower energy bills, further reduce their environmental impact, and improve the air quality and comfort of public buildings.

Figure 3 – Energy Code Status by City

Local Climate Change Initiatives

West Virginia has four cities signed on to the US Conference of Mayors Climate Protection Agreement. The West Virginian cities were Fayetteville, Morgantown, Oak Hill and Shepherdstown. Under the
Agreement, participating cities commit to take three steps. First, all commit to meet or surpass Kyoto Protocol targets in their own communities. Second, they commit to urge their state governments and the federal government to enact policies and programs to meet or exceed the greenhouse gas emission reduction target suggested for the United States in the Kyoto Protocol. Finally, the signatories commit to urge the U.S. Congress to pass greenhouse gas reduction legislation, which would establish a national CO2 emissions trading system.

Another climate group with a presence in West Virginia communities is ICLEI, an association of over 1100 local governments in 68 countries who have made a commitment to sustainable development. The two members in the state are Fairmont and Fayetteville. ICLEI members receive technical consulting, training, and resources to help build capacity, share knowledge, and support local government in the implementation of sustainable development at the local level.  

Morgantown, WV is also a member of the Sierra Club’s Cool Cities Program. Cool Cities is a volunteer based national program that initiates “collaboration between community members, organizations, businesses, and local leaders to implement clean energy solutions that save money, create jobs, and help curb global warming.”

Overview of Local Green and Above-Code Building Programs

Additionally, the city of Morgantown has taken additional steps to “green the city” with the creation of a Municipal Green Team. The team was created by the Morgantown City Manager to serve as an advisory body to the City Manager and City Council. The group advises public policy, planning, education, departmental management, new development, and evaluation of environmental and energy related matters.

The group has outlined a number of goals, including a commitment to making progress to meet the objectives associated with the U.S. Mayors Climate Protection Agreement. The team also undertakes educational outreach in the community related to energy efficiency and climate issues. As well, the team helps facilitate the Green Building Municipal Leadership Initiative. They also provide recommendations and planning for increased efficiency, green vehicles and travel solutions, and promote renewable energy solutions that are consistent with needs, opportunities and resources available to the Greater Morgantown area. The team is split into four subcommittees: Energy, Recycling, Transportation, and Green Architecture.

Another important group, The West Virginia Environmental Council, works to facilitate communication and cooperation to promote environmental protection in West Virginia. They work with other environmental organizations and correspond with all local, state and federal agencies who are involved with West Virginia’s environmental management. They represent an important conduit to coordinate code related efforts on the part of local environmental groups throughout the state.
Adoption Summary: Best Practices and Recommendations

West Virginia could take a number of actions to build on the state’s existing practices. Significantly, the state has taken the step of creating a mandatory statewide energy code. The state can build on this by adopting the 2009 IECC and achieve further gains in energy efficiency, and simultaneously achieve compliance with the Recovery Act. In support of the state energy plan, legislation or rulemaking that allows regulators to conduct regular review and update of the model energy code would also promote speedy consideration of code updates. Additionally, while many jurisdictions in the state have chartered efforts to improve the energy efficiency of buildings within their purview, the state could take additional actions to incentivize advanced building activity.

**Gap:** The state is not EPAct compliant and the state’s minimum energy code does not reach the stringency of the 2009 IECC.

**Recommendation #1:** BCAP recommends that the state adopt the 2009 IECC and ASHRAE Standard 90.1-2010 as the mandatory, statewide energy codes without weakening amendments.

**Gap:** The state does not have an automatic energy code review process on a three-year cycle.

**Recommendation #2:** The state should adopt an automatic review process for future iterations of the model energy code to lock in future energy savings and remove speculation after the release of each new model energy code.

**Gap:** The state does not have a mandatory green or advanced code policy for state-funded facilities.

**Recommendation #3:** West Virginia should pass legislation that mandates that all state-funded facilities meet the requirements of a recognized national green building or high performance standard or code.

**Gap:** The number of advanced, voluntary above code residential construction projects and energy efficiency incentives is limited.

**Recommendation #4:** The state should support additional above code work, especially by promoting Energy Star or Building America programs at the local level and engaging utility participation in rebate and incentive programs—which have proven popular and effective in other states.

**Implementation**

While energy code adoption is the necessary first step in the energy codes process, it does not guarantee compliance. To achieve the desired energy and financial savings available through energy
codes, states and cities must carry out energy code implementation, a term used to describe all of the activities needed to prepare state energy offices, local building departments, the building industry, and other stakeholders for compliance with the energy code. It includes outreach to stakeholder groups, on-site, classroom, and web-based training, establishing and utilizing enforcement infrastructure, tools, and systems, and other educational and organizational efforts.

Overview of State and Local Implementation Policies

West Virginia has a strong tradition of requiring certification standards, as plan reviewers, code officials, and inspectors must be certified through the state and ICC. While the code is state law however, the state allows local jurisdictions to set their own enforcement standards. One code official sums it up best: “it’s up to local jurisdictions or counties to enforce [the code]. There’s no statewide enforcement [so] it’s up to contractors and builders to build to the prescribed code.”

Outreach

Energy codes have come a long way, but there are still many people unaware of their benefits, including most consumers and some policymakers. Many code officials and building and design professionals are also uneducated about energy code benefits and requirements. Outreach involves all of the activities states and local jurisdictions can undertake to raise awareness of the need for energy codes, promote their adoption and implementation, and identify opportunities for training, technical assistance, and other support. Given the diversity of the energy codes community across the country, execution of strategic outreach campaigns can improve understanding of code changes, create buyin, and can lead to greater levels of compliance.

State’s Role in Promoting Codes

Traditionally, the state’s actions to advance energy code extend to coupling a statewide mandatory code with certification requirements for inspection staff and building professionals. The state has allowed local governments, by contrast, considerable latitude on how they choose to enforce the energy code. West Virginia has created some statewide consumer-related efficiency programs, and most recently the state created a mail-in rebate program to help residents replace older, inefficient appliances with efficient ENERGY STAR qualified appliances. See Statewide Climate Change Initiatives on page 13 for additional details. Interestingly—unlike other aspects of the code inspection process—the state takes an active role in electrical inspections, as all electrical inspections are conducted by a single state-contracted third party inspection company.

Local Government’s Role in Promoting Codes

Local governments, for their part, report few code outreach efforts apart from their code inspection duties. However, many code officials explain that they conduct tutorials for contractors in the field when discovering code compliance problems: “There’s all levels of quality and knowledge in builders and
contractors. Some are just ‘we’ve built this way for years and this is how we do it.’ I feel that we’re teachers in a way and that’s our job.”

**Gap:** Local governments do not have the resources to engage in outreach to building contractors and other professionals in the building sector apart from those opportunities afforded in their normal duties.

**Recommendation #5:** The state could provide materials and financial assistance to local governments in their efforts to engage local building professionals about the code. Doing so will improve baseline compliance on the part of the construction industry.

**Stakeholders’ Role in Promoting Codes**

These groups can raise awareness of energy efficiency issues, often directly to energy consumers. When consumers start caring about energy issues, it increases demand for energy-efficient construction, which creates an environment in which improved construction practices and techniques required to meet the provisions of the latest energy codes become standard practice. This, in turn, allows for the adoption and implementation of even more efficient energy codes.

**Enforcement Community**

The enforcement community provides the teeth behind adopted codes, as it is their responsibility to ensure that design and building professionals comply with the provisions of the energy code. While enforcement is most commonly a local issue, states play a crucial role in providing municipalities with the resources and support they need to establish effective enforcement infrastructures and practices. As codes are a moving target, it is also incumbent on states and cities to provide the enforcement community with access to sufficient energy code training.

**Overview of Enforcement Infrastructure**

The state-mandated energy code may legally obligate local governments and builders to follow the 2003IECC, but the state’s rural areas are large areas of the state which go without effective energy code inspection. As Beckley, WV code inspector (and President of the state code officials association) Bob Cannon explains: “Of the 55 counties in West Virginia, eight have adopted the 2003 IECC as have 67 cities...The catch-22 is that if you build a house you still must build it to the code, but it’s not enforced. So homeowners could sue contractors that don’t build to it...fortunately all the large cities and the big counties [have adopted the code].” Like cities, county governments throughout the state are allowed to conduct inspections, although many forgo inspections entirely or rely on their constituent cities to conduct inspections. For those jurisdictions with no enforcement, code compliance is the responsibility of the builder. Sums one code official: “so it’s up to the builder: if he’s honest or fly-by-night.”

**Gap:** Local governments often lack the resources to adequately enforce the energy code.
Recommendation #6a: For areas in the state that lack code enforcement infrastructure, the state can provide third party contractors or state hired inspectors to augment or fully cover energy code plan review and inspection.

Recommendation #6b: The state should develop state-level capacity for determining which jurisdictions lack sufficient infrastructure to perform inspections, and ensure that they are able to hire 3rd party inspectors.

Despite scattershot enforcement of the code statewide, the state has an active code enforcement community, led by the West Virginia Code Officials Association. The association, which doubles as an International Code Council (ICC) chapter, has about 150 members statewide and offers important online resources, including: a calendar of CEU training events, important code changes, and a member directory.24

Enforcement infrastructure in most large cities and counties that inspect buildings for the energy code is consistent across the state. The state allows locals considerable freedom to charge their own permit fees, which are set locally based on project size and complexity. The state does not supplement local inspection budgets, so collected fees are used to fund inspection departments directly. Some exceptions to this rule exist. In Greenbrier County, permit fees were directly tied to the department budget, but recent policy change reduced fees, requiring the county to fund a portion of the inspections budget with general funds.

Most departments separate plan review from the in-field inspection process, but the lines between the two is blurred in the smallest jurisdictions. One local official, for instance, explained that not only does he manage plan review and inspection; he also handles local zoning and is a licensed contractor. For plan review, requirements vary widely between jurisdictions. An architect’s certification is sometimes necessary, although projects under a certain size are often exempt from this requirement. In other jurisdictions, an architect or engineer certification is linked to the projected project cost. In Parkersburg WV, for instance, residential plans do not require an architect’s stamp of approval, but commercial plans almost always do. By contrast, in the town of Lewisburg, architects must stamp all buildings over 7600 square feet. In many jurisdictions, designers are required to complete COMcheck on behalf of the applicant, while the plan review staff will check compliance by running REScheck for residential buildings.
Perhaps because the energy code is a statewide mandate and statewide ICC certification is required, those building departments that do inspections claim a level of familiarity with the energy code. Code officials usually have a background in the construction industry, but not necessarily in energy-efficiency. Most code officials are certified to conduct many of the required inspections and use of checklists and other in-the-field tools, such as laptops or handhelds, is mixed.

**Gap:** Handheld electronics and testing equipment must be purchased at the local level, which many code departments cannot afford at present.

**Recommendation #7:** State officials could subsidize the purchase of handheld electronics for inspectors as well as other testing equipment, including duct blasters and blower door equipment.

Common energy code violations cited by inspectors in the field include under and oversized HVAC equipment, improper insulation techniques, and—perhaps the most commonly cited problem—improper air sealing. Inspectors are empowered to issue construction stop orders, and one suggested that missing or improperly installed insulation would be one area of the energy code that might prompt a work stoppage.
With the exception of mandating state codes, the state rarely interact with local building departments and likewise has not undertaken a study to assess the need for better infrastructure at the local level. State oversight is especially scant in rural areas that often go without inspections—save the state-mandated electrical inspection. State buildings, for their part, are exempt from local inspection fees, but are often inspected by local officials nonetheless. Statewide declines in construction, depicted in figure 4, above, are confirmed by code officials, who report declining inspections due to construction slowdowns.

**Certification and/or Licensing**

Local code officials statewide are required to be certified via ICC and registered by the state Fire Marshall’s Office. The state classifies code officials and inspectors under the following categories: building code inspector, building code official, and building code plans examiner. To apply for certification as an inspector, applicants must pass four ICC exams covering commercial buildings, commercial electrical inspections, commercial mechanical inspections, and commercial plumbing inspections. Code Officials must pass five specified tests, and plans examiners must pass four. Those officials working prior to August 6th, 2006 are “grandfathered in” and exempt from ICC testing. The certification fee for all groups is $50 and officials must renew every three years.\(^{25}\)

**Training and CEUs**

All code officials in West Virginia must complete continuing education units (CEUs). To maintain certification, officials must take at least 1.5 CEUs per year in courses approved by the State Fire Commission. A continuing education unit is the equivalent of 10 hours of instruction. Officials are not required to take courses in any specific area, including energy.\(^{26}\) The West Virginia Code Officials Association organizes training opportunities and posts them on their website.\(^{27}\)

**Gap:** Building professional groups are not required to take energy code specific ICC tests or attend continuing education courses related to the energy code.

**Recommendation #8:** Energy code enforcement could be improved by requiring code officials to take ICC tests or CEUs related to the energy code. Because as few as two classes can cover annual CEU requirements for officials, the state could increase CEU requirements or require that the energy code be covered in state-approved training.

**Third Party Infrastructure**

Third party inspections efforts are common in West Virginia, especially as all electrical inspections are conducted by a third party inspector. Aside from electrical inspections, local code officials report that third party code inspections for energy code compliance is permitted, but not common. Perhaps owing to a lack of demand within the state, of the 23 companies certified to conduct HERS ratings in the state, only two are located within the state’s borders—the remaining 21 are headquartered in neighboring Virginia, Maryland, Pennsylvania, and Ohio.\(^{28}\)
Gap: The state has not issued formal guidance on the opportunities third party code inspectors offer to local jurisdictions that do not have capacity in place to conduct inspections.

Recommendation #9: State officials could also offer formal guidance on the use of 3rd party code inspectors—who can aid local governments in inspecting specialized buildings and support local code staff in rural areas.

Local Variations in Energy Code Structure

Local variations in the energy code are not in evidence, as local communities must enforce the statewide code. Variations in building performance at the local level are attributable to local governments with strong enforcement departments in contrast to areas of the state in which energy code performance is not policed by the local jurisdiction.

Design/Construction Community

The design and construction community—made up of designers, architects, engineers, developers, builders, and subcontractors—are in charge of conceiving and constructing the built environment. It is ultimately their responsibility to comply with the requirements of the adopted energy codes. However, state and local agencies, energy code advocates, and other stakeholder groups share in this responsibility. They have the opportunity to provide the training, tools, educational materials, and support to understand and be able to comply with the code, including how to correctly install materials and use testing equipment. They can also work with the design and construction community to establish a workable compliance process that is accountable, yet flexible, and accommodates local practices and circumstances.

Overview of Design/Construction Community Infrastructure

The design and construction community interacts with code inspectors in West Virginia at different points during the building design and construction process. Code officials in the state give high marks to architects for their grasp of the energy code, with whom code officials interact during design and plan review. According to code officials, both architects and construction professionals have demonstrated a growing understanding with energy efficiency features. Like builders nationwide, openness to energy code improvements is checked by the building sector’s concern about added cost. According to code officials, implementation of the energy code by construction professionals can be scattershot, dependent on an individual builder’s buy-in and uneven code enforcement—owning to limited enforcement in rural areas.

Certification and Licensing

According to West Virginia state law, contractors must be licensed with the West Virginia Division of Labor. Contractors must pass a state exam and post their license prominently at worksites. Statewide, building permits cannot be issued to contractors lacking a license for all construction jobs larger than
$2,500. WV Division of Labor inspectors travel statewide conducting random inspections of contractor work and also investigate claims of unlicensed contractors. Plumbers are also licensed through the state Division of Labor. To obtain a license, all applicants must provide proof of experience and take a written exam. Electricians, who must also be licensed with the state, must take a test administered by the Office of the State Fire Marshal and must renew their license annually.

Architects are regulated by another public agency, the West Virginia Board of Architects. Not only must architects register with the board, they must renew annually and complete CEU credits. Likewise, the West Virginia State Board of Registration for Professional Engineers requires licensure of professional engineers and requires the passage of an exam. The Board’s website also offers assistance to consumers in the form of licensure verification tool on their website.

Training and CEUs

Both architects and professionals engineers must obtain continuing education credits (CEUs). Architects are required by the West Virginia Board of Architects to obtain 12 Professional Development Units (PDUs) per year. Architects are given considerable freedom in what qualifies as a PDU, as long as they qualify as “structured educational activities.” The board audits a random number of architects annually to assure CEUs are met. Professional Engineers must accumulate 15 Professional Development Hours (PDH). None are required to focus on energy efficiency, and they can be counted from activities as diverse as publishing a paper, taking a college course or training event, and teaching a class. Despite the requirements for architects and engineers, many design and construction professionals, such as contractors, are not required to take CEUs.

**Gap:** Many building professional groups are not required to attend continuing education courses.

**Recommendation #10a:** Energy code enforcement could be improved by requiring many building professional groups to attend continuing education courses.

**Recommendation #10b:** Additionally, to achieve certification, the state could specify that a percentage of approved CEU activities be dedicated to the energy code – which is not a requirement of CEUs for any group, including code officials.

**Compliance Measurement and Verification**

With energy codes becoming ever more stringent, it is increasingly important for the enforcement and building communities to take extra steps beyond code to ensure that compliant buildings achieve their predicted energy savings, as many buildings fall short of their potential. The solution to underperforming buildings is measurement and verification, or the process of measuring energy performance and verifying that it matches the expected outcome. On the micro level, this process—known as commissioning for large commercial construction and performance testing for residential construction—involves blower door tests, duct blaster tests, and other performance measurements. On the macro level, it can involve state agencies, utilities, building science professionals, advocacy
organizations, and other stakeholders compiling and analyzing building performance statistics to measure compliance and gauge implementation effectiveness.

**Past and Current Activities**

Currently, West Virginia has no current efforts in place to measure or evaluate code compliance, nor has it launched an effort to measure compliance at the statewide or local level. Likewise, local utilities and the Southeast Energy Efficiency Alliance SEEA—perhaps the most applicable regional energy efficiency group—have not launched any such effort. The state’s home rule tradition has meant that compliance measurement from the state level difficult, as the state does not actively engage in code enforcement at the local level, save electrical inspections. At the local level, attempts to track or measure compliance measurement are not in evidence.

**Gap:** The state has thus far not undertaken statewide code compliance monitoring

**Recommendation #11a:** The state should verify energy code compliance by developing a comprehensive state effort to measure energy code compliance.

**Recommendation #11b:** The state should review of the Department of Energy’s guidance on measuring energy code compliance.

**Implementation Summary: Best Practices and Recommendations**

West Virginia has done a great deal build certification and training credentials within the inspection community. All plan reviewers, code officials and inspectors must be certified through the state and ICC. In addition to requiring testing from these professionals, the state requires annual continuing education units (CEUs).

In addition to requirements placed on code officials, the state requires contractors to be licensed and polices their work in response to complaints. Further, boards have been established to regulate the certification and training of both architects and engineers.

In addition to these successful efforts, there a number of activities that the state could undertake to facilitate improved implementation of the energy code. At present, the state requires professional trades to register with the state and—in the case of some trades—to stay up-to-date on current practice through continuing education requirements. However, some of these groups, including homebuilders and contractors, do not have to submit to any ongoing continuing education requirements. The state could also do more to work with possible partners, including leading organizations, and relevant federal agencies to meet compliance targets. In summary, BCAP has identified the following gaps and recommendations:

**Gap:** Local governments do not have the resources to engage in outreach to building contractors and other professionals in the building sector apart from those opportunities afforded in their normal duties.
Recommendation #5: The state could provide materials and financial assistance to local governments in their efforts to engage local building professionals about the code. Doing so will improve baseline compliance on the part of the construction industry.

Gap: Local governments often lack the resources to adequately enforce the energy code.

Recommendation #6a: For areas in the state that lack code enforcement infrastructure, the state can provide third party contactors or state hired inspectors to augment or fully cover energy code plan review and inspection.

Recommendation #6b: The state should develop state-level capacity for determining which jurisdictions lack sufficient infrastructure to perform inspections, and ensure that they are able to hire 3rd party inspectors.

Gap: Handheld electronics and testing equipment must be purchased at the local level, which many code departments cannot afford at present.

Recommendation #7: State officials could subsidize the purchase of handheld electronics for inspectors as well as other testing equipment, including duct blasters and blower door equipment.

Gap: Building professional groups are not required to take energy code specific ICC tests or attend continuing education courses related to the energy code.

Recommendation #8: Energy code enforcement could be improved by requiring code officials to take ICC tests or CEUs related to the energy code. Because as few as two classes can cover annual CEU requirements for officials, the state could increase CEU requirements or require that the energy code be covered in state-approved training.

Gap: The state has not issued formal guidance on the opportunities third party code inspectors offer to local jurisdictions that do not have capacity in place to conduct inspections.

Recommendation #9: State officials could also offer formal guidance on the use of 3rd party code inspectors – who can aid local governments in inspecting specialized buildings and support local code staff in rural areas.

Gap: Many building professional groups are not required to attend continuing education courses.

Recommendation #10a: Energy code enforcement could be improved by requiring many building professional groups to attend continuing education courses.

Recommendation #10b: Additionally, to achieve certification, the state could specify that a percentage of approved CEU activities be dedicated to the energy code – which is not a requirement of CEUs for any group, including code officials.
Gap: The state has thus far not undertaken statewide code compliance monitoring

Recommendation #11a: The state should verify energy code compliance by developing a comprehensive state effort to measure energy code compliance.

Recommendation #11b: The state should review of the Department of Energy’s guidance on measuring energy code compliance.
Conclusion

Building energy codes are one of the most straight-forward and common sense ways for West Virginia to secure its energy future. Not only will they help consumers save money on their energy bills, code compliance will reduce the load on the grid, resulting in a cleaner environment and a protected and diverse energy supply. In many parts of the state the attitude and the infrastructure is already in place, but passing the 2009 IECC for statewide use, ensuring high compliance rates, and creating a demand for compliance will help West Virginia continue in the right direction toward greater energy efficiency.

Through greater communication and assumed authority as the organization responsible for the implementation of the statewide energy codes, the West Virginia Division of Energy can help pave the way toward energy efficiency through codes. Together with other state agencies—especially the State Fire Marshall’s office—and local level governments, the Division of Energy can provide the training and resources necessary to keep the building community up-to-speed on the current energy code and its requirements. The state can also encourage local building inspection departments to take an even more active role in energy code enforcement, as well as encourage the design and construction communities to build awareness and familiarity of the code and the benefits of energy efficiency. By strengthening the implementation of the model energy code, West Virginia will ensure that it reaps all of the benefits the code has the potential to provide.

The recommendations made as a result of this gap analysis, summarized below in figure 5, are meant to guide the stakeholders in West Virginia to meet these goals for code adoption and implementation and help in the development of a compliance action plan. Though some recommendations may require increased funding over extended periods of time, an action plan will help make sure that new construction in the Virginia achieves 100% compliance to model energy codes now and in the future.
### Adoption

#### State Policy

- BCAP recommends that the state adopt the 2009 IECC and ASHRAE Standard 90.1-2010 as the mandatory, statewide energy codes without weakening amendments. Pg 12
- The state should adopt an automatic review process for future iterations of the model energy code. Pg 12
- West Virginia should pass legislation that mandates that all state-funded facilities meet the requirements of a recognized national green building or high performance standard. Pg 13
- The state should support additional above code work, especially by promoting Energy Star or Building America programs at the local level and engaging utility participation in rebate and incentive programs—which have proven popular and effective in other states. Pg 15

### Implementation

#### Outreach

- The state could provide materials and financial assistance to local governments in their efforts to engage local building professionals about the code. Doing so will improve baseline compliance on the part of the construction industry. Pg 20

#### Enforcement Community

- For areas in the state that lack code enforcement infrastructure, the state can provide third party contactors or state hired inspectors to augment or fully cover energy code plan review and inspection. Pg 21
- The state should develop state-level capacity for determining which jurisdictions lack sufficient infrastructure to perform inspections, and ensure that they are able to hire 3rd party inspectors. Pg 21
- State officials could subsidize the purchase of handheld electronics for inspectors as well as other testing equipment, including duct blasters and blower door equipment. Pg 22

#### Training

- Energy code enforcement could be improved by requiring code officials to take ICC tests or CEUs related to the energy code. Pg 23
- State officials could also offer formal guidance on the use of 3rd party code inspectors – who can aid local governments in inspecting specialized buildings and support local code staff in rural areas. Pg 24

#### Design/Construction Community

- Energy code enforcement could be improved by requiring many building professional groups to attend continuing education courses. Pg 25
- Additionally, to achieve certification, the state could specify that a percentage of approved CEU activities be dedicated to the energy code – which is not a requirement of CEUs for any group, including code officials. Pg 25

#### Compliance Measurement & Verification

- The state should verify energy code compliance by developing a comprehensive state effort to measure energy code compliance. Pg 26
- The state should review of the Department of Energy’s guidance on measuring energy code compliance. Pg 26
Acknowledgments

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Cover page courtesy of Flickr Creative Commons, user Code Poet
Appendix A

The Department of Energy (DOE) provides a number of useful resources that can assist states and local governments in their efforts to achieve code compliance. Many of these resources are available at Energycodes.gov. Materials include training presentations and background on DOE-sponsored software programs, Rescheck and Comcheck, which evaluate compliance for residential and commercial buildings, respectively. These software programs, which present prescriptive code requirements and calculate compliance tradeoffs, simplify the process of evaluating a building’s code compliance. By explaining requirements, these software programs can help designers, builders, and code officials streamline efforts to achieve code compliance.

Resource Guides for Code Officials
1. ICC/DOE BECP Resource Guide for Code Officials: a comprehensive and easy to read collection of the best resources available from ICC and DOE.
   http://www.energycodes.gov/publications/resourceguides/

Energy Code Compliance Training Materials:
1. Commercial PowerPoint Training with links to videos

2. Residential PowerPoint Training with links to videos

3. DOE Guidance for State Compliance Measurement Efforts

Primer on Rescheck and Comcheck
1. Commercial Compliance
   http://www.energycodes.gov/comcheck/

2. Residential Compliance
   http://www.energycodes.gov/rescheck/

Available Downloads
1. Commercial Basic Requirements Download
   http://www.energycodes.gov/comcheck/download.stm

2. Residential Basic Requirements Download
   http://www.energycodes.gov/rescheck/download.stm
Users Guides

1. COMcheck Software Guide

2. REScheck Software Guide

Plan Check and Field Inspection

   http://www.energycodes.gov/training/pdfs/comm_review_guide1.pdf

2. Residential Plan Review Quick Reference Guide

3. Code Notes
   http://www.energycodes.gov/help/notes.stm
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