

Building Codes Assistance Project (BCAP)

BCAP is in a strong position as a non-profit and a national advocacy organization to assist in local and broad-based activity to advance codes. We offer unique expertise, in that over fifteen years we have supported numerous state and city building departments in adopting and implementing energy codes. During that time, we have provided education and delivered resources on codes across the country. As a trusted resource, we are able to identify and navigate past the policy and programmatic pitfalls to help states and jurisdictions put the best possible strategy in place to improve efficiency in new and existing buildings. We are also well-positioned to share value across organizations and pull together local efforts, identify issues on a national scale, and provide a broad perspective unbiased by corporate/material interests.

Southeast Energy Efficiency Alliance (SEEA)

SEEA promotes energy efficiency for a cleaner environment, a more prosperous economy, and a higher quality of life in the Southeastern region of the United States. Based in Atlanta, and working in eleven states, SEEA brings together businesses, utilities, governments, public utility commissions, energy service companies, manufacturers, retailers, energy and environmental organizations, low-income energy advocates, large energy consumers, and universities to promote energy-efficient policies and practices.

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Acronyms and Abbreviations

ADECA – Alabama Department of Economic and Community Affairs
AGI – Alabama Green Initiative
ARRA/Recovery Act – American Recovery and Reinvestment Act of 2009
ASHRAE – American Society of Heating, Refrigerating, and Air-Conditioning Engineers
BCAP – Building Codes Assistance Project
BPI – Building Performance Institute
CEUs – Continuing education units
COAA – Code Officials Association of Alabama
DOE – Department of Energy
ECAP – Energy Code Ambassadors Program
EECBG – Energy Efficiency and Conservation Block Grants
EPA – U.S. Environmental Protection Agency
HBAA – Home Builders Association of Alabama
HBLB – Home Builders Licensure Board
HERS – Home Energy Rating System
IBC – International Building Code
ICC – International Code Council
I-Codes – International Codes
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
RECA – Responsible Energy Codes Alliance
RESNET – Residential Energy Services Network
SEEA – Southeast Energy Efficiency Alliance
SEO – State Energy Office
SEP – State Energy Program
TVA – Tennessee Valley Authority
USGBC – U.S. Green Building Council

Executive Summary

The Building Codes Assistance Project (BCAP) and the Southeast Energy Efficiency Alliance (SEEA) conducted an investigation of current energy code practices in Alabama to provide a useful and realistic analysis identifying the current gaps in the adoption of a mandatory, uniform Alabama Energy Code and the existing enforcement and compliance infrastructure, as well as offering a number of practical recommendations for future action. As explained in the document, there is significant potential for substantial energy efficiency gains throughout the State. The necessary first step is the adoption of the energy code, which is provided for through Alabama Act 2010-185. The appointed Board will set the baseline for energy efficiency in all new construction and major renovations. However, there are many steps to the successful implementation of an energy code, including building professional capacity throughout the State and ensuring enforcement of the code. As you will see in this document, while Alabama has many steps ahead, significant potential exists. In an uncertain energy future, the adoption and implementation of a strong energy code provides the easiest and best way to address future energy demand. This document will serve as the first step in the development of a policy action kit, which will be designed to aid municipalities in adoption, implementation, and enforcement of the statewide code.

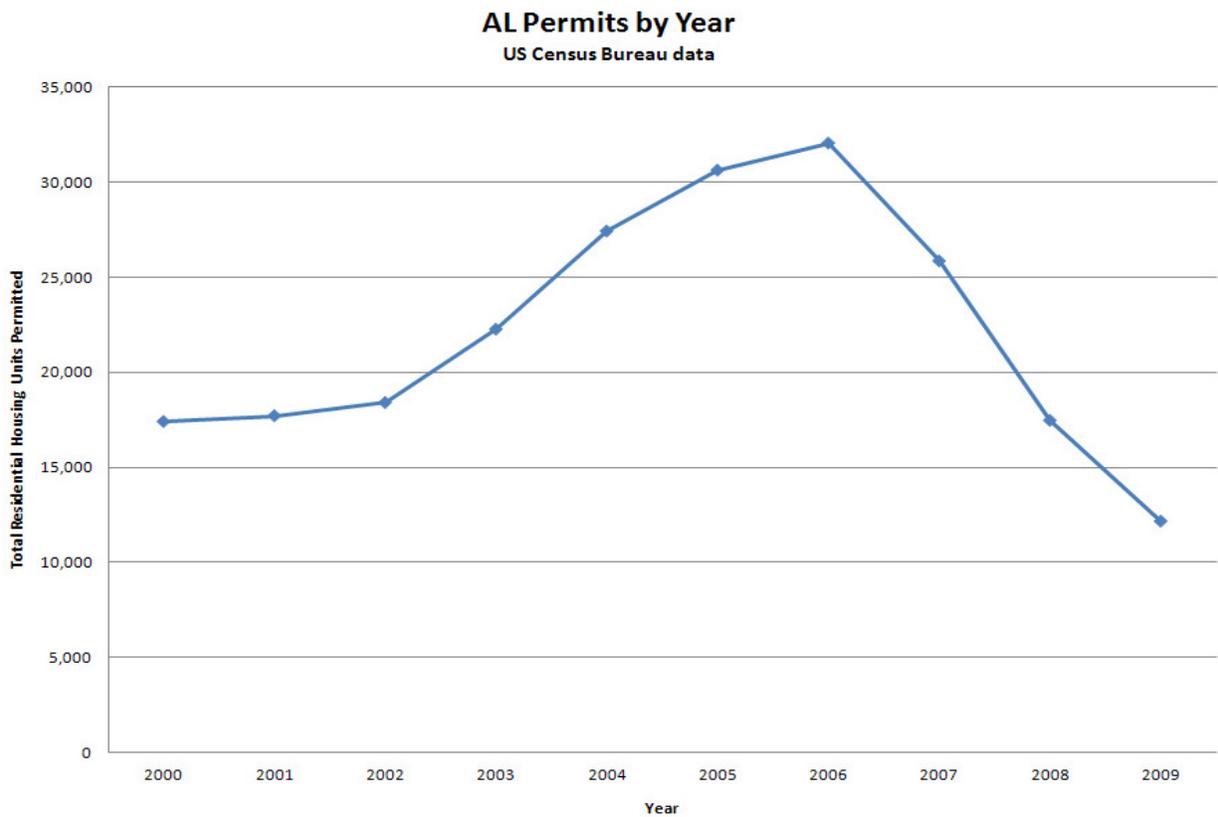
Introduction

Buildings account for almost 40 percent of total energy use in the United States and 70 percent of our electrical use.¹ Considering the uncertainty of energy supply and price, building construction represents a significant opportunity for energy savings. New construction is the most cost-effective point in the life of a building to establish minimum energy efficiency elements, and building codes serve as a logical starting point for comprehensive policies to reduce energy dependence and extend our natural resources.

This gap analysis assesses opportunities, identifies available resources, and develops effective implementation plans for the state and local levels. Working through barriers at the local level will ultimately produce best practices and leaders in the State, which will also benefit other jurisdictions and the State as a whole. Through collaboration at the state level, BCAP and SEEA will assist Alabama in building their capacity to support energy codes in a sustainable manner through increased understanding of local needs and effective solutions.

Construction Overview

Figure 1



The construction industry in Alabama has suffered since the collapse of the housing market. As Figure 1 illustrates, the total annual residential housing units permitted has fallen from over 30,000 in 2006 to under 15,000 in 2009. Consequently, there have been substantial layoffs of construction workers and code officials across the State. Alabama should take advantage of the one-time, American Recovery and Reinvestment Act of 2009 (Recovery Act) funds to improve the efficiency of new buildings, thereby saving homeowners and businesses money and decreasing the dependence on other states for energy.

Energy Portfolio

Despite producing a substantial amount of energy, Alabama falls far below its potential to export energy due in a large part to its high per capita usage of energy. Although ranked thirteenth in total per capita energy production, Alabama currently ranks ninth overall in total per capita energy consumption.² This sizeable consumption causes Alabamians to be dependent on coal deliveries from other states, which is the dominant fuel in the State. Alabama's natural gas production accounts for over one percent of total U.S. production, and its two nuclear power plants account for over five percent of total U.S. nuclear electricity generation and 25 percent of electricity generated in the State.³ Alabama also generates a large proportion of its energy from numerous dams along the Alabama and Coosa Rivers. The State is one of the largest hydroelectric power producing states east of the Rocky Mountains.⁴

The potential energy supply available through building energy-efficient buildings provides a significant untapped resource that can be made available through the enforcement of energy codes. Although electricity rates have typically been below average in the residential, commercial, and industrial sectors when compared to the rest of the country, energy prices will continue to rise over the next decade. The large amount of energy consumption in Alabama is responsible for over three percent of total U.S. carbon dioxide emissions, almost five percent of sulfur dioxide emissions, and over three percent of nitrogen oxide emissions. The State can reduce energy costs and emissions for its residents and businesses by ensuring that buildings meet basic energy performance standards through their design and construction. In the process, Alabama can reduce electricity demand within its borders and ultimately export larger quantities to other states in the region. It would be wise for the State to manage its energy resources by seizing the "low-hanging fruit" that building codes offer.

Adoption

Federal Policy

In the United States, building energy codes are adopted on both 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 federal government—through Congress and the Department of Energy (DOE)—has played a significant role in advancing energy code development, determining the national model energy codes, and supporting state- and local-level adoption and implementation.

In 2009, Congress passed the Recovery Act. According to the Recovery Act, states must adopt the 2009 International Energy Conservation Code (IECC), as well as achieve 90 percent compliance with the code by 2017 to receive stimulus funds through the Energy Efficiency and Conservation Block Grants (EECBG) and the State Energy Program (SEP). DOE approved the Alabama Department of Economic and Community Affairs' (ADECA) EECBG program plan and awarded ADECA a \$10,350,200 formula grant, a portion of which the State will use for an energy retrofit grant program for local jurisdictions. As a stipulation for receiving SEP funds, Governor Riley wrote a letter of assurance to the DOE, committing the State to “consider actions to improve building energy codes, consistent with state law...and to consider the statutory language contained in the Recovery Act.”⁵ Based on the governor’s assurance and the State Energy Plan submitted by ADECA, DOE awarded \$55,570,000 of SEP funds to the State for energy efficiency and renewable energy programs.⁶

State Policy

Home Rule

Alabama is a home rule state. As such, local municipalities have broad authority to adopt policies that they feel best fit the needs of their communities without undue state interference or mandates. One important consequence of this system is that the State does not have mandatory statewide energy codes. Rather, a number of different state entities have jurisdiction over establishing all statewide building codes—including energy—for different types of buildings. Municipalities may choose to adopt building codes for any building that does not fall under these regulations.

The Alabama Building Commission is responsible for administering the Alabama State Building Code, based on the 2006 International Codes (I-codes) and including the IECC. The State Building Code applies to state buildings and other construction projects, schools, hotels, and movie theaters, with the exception of the IECC and the Wheelchair Accessibility Standards, which only apply to state-funded buildings.⁷

The Alabama Department of Public Health, Technical Services Unit is responsible for administering the National Fire Protection Association’s 2000 Life Safety Code. It applies to all licensed healthcare facilities throughout the State, but does not include any energy efficiency provisions.⁸

The State Fire Marshal’s Office is responsible for administering the State Fire Marshal Regulation, based on the 2003 Uniform Fire Code, the 1998 Standard Existing Building Code, the 1997 Standard Building Code, and the 1994 Standard Fire Prevention Code. It applies to all buildings that do not fall under the jurisdiction of the State Building Code or Life Safety Code, but does not include any energy efficiency provisions.⁹

New Legislation

Until recently, all residential and commercial buildings that did not fall under any of these statewide jurisdictions—the vast majority of buildings in Alabama—were subject to local laws. The Alabama Residential Energy Code Board promoted the voluntary adoption of the 1993 Model Energy Code (MEC) and its successors for residential buildings.

In March 2010, however, the Alabama State Legislature passed Act 2010-185. This law establishes the Alabama Energy and Residential Codes Board and grants it the authority to review, amend, adopt, and implement the Alabama Energy and Residential Codes. The law stipulates that the Codes will be based on the International Code Council (ICC) 2006 IECC and the American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE) Standard 90.1-2007 for commercial buildings and the ICC 2006 International Residential Code (IRC) for residential buildings, or any subsequent editions. The Board will also be required to consider updates to the model energy codes within two years of their most recent publication dates. Furthermore, the law prohibits local jurisdictions from adopting codes that conflict

2009 IECC in Alabama

- Adoption would likely improve a number of thermal envelope measures in new residential construction, including ceiling and wood frame wall insulation and fenestration (window) requirements
- Code applies to new buildings and additions/alterations/renovations
- Climate Zone 3: R-20 Ceilings, U-0.50 Windows and Doors, R-13 Walls, R-19 Floors, R-5 Foundations, 0.30 SHGC glass, skylight U-0.65
- Climate Zone 2: R-30 Ceilings, U-0.65 Windows and Doors, R-13 Walls and Floors, and 0.30 SHGC Glass, skylight U-0.75
- Building envelope: Must be caulked and sealed; supply ducts in attics must be insulated to R-8; return ducts in attics and all ducts in crawlspaces, unheated basements, garages, or otherwise outside building envelope must be insulated to R-6; all ducts must be sealed and either verified by pressure testing or installed entirely within the building thermal envelope
- Piping for hydronic (boiler heating systems must be insulated to R-3
- Less insulation is allowed for mass walls, and more is required for steel framing
- Insulation is not required for slab-on-grade foundations
- Exemptions/Allowances from prescriptive measures: one door and 15ft² of window area
- Windows can never exceed an area-weighted SHGC of 0.50
- Compliance paths include prescriptive, total building envelope UA (U-factor multiplied by area), and simulated performance

with the new state codes or amending code provisions mandated or required by any federal law, such as the Recovery Act.

As of April 2010, the State had not yet formed the 17-member Board. The makeup of the board includes members from the: homebuilders association; heating and air condition board; investor owned utilities; rural electric cooperatives; the natural gas industry; city and county governments; the legislature; and the local ICC chapter, among others. The composition of this Board is very similar to other regulatory taskforces in other states.

The legislation did not mandate a new date (current legislative date states as soon as possible after July 31, 1995) for the Board to convene by, and the Board has yet to meet at the publication of this document. What is clear, though, is that the legislation enables the adoption of mandatory commercial and residential energy codes, which in and of itself is a significant departure from business-as-usual and a large step forward for the State. This new Board will work to bring the State into compliance with certain federal energy and building requirements, which will require the Board to consider the adoption of the latest model energy code and work towards 90 percent compliance.

State Climate/Green Initiatives

Similar to many of its neighbors in the South, Alabama has not undertaken a comprehensive climate change action plan. In 1997, the University of Alabama, with partial funding from the U.S. Environmental Protection Agency (EPA), completed a climate change mitigation study for the State. The project team first developed a baseline for greenhouse gas emissions. It then put together an advisory panel of state experts to produce a number of policy recommendations and analyze their potential impact, political feasibility, institutional acceptance, and ease of implementation, which it presented to the appropriate state agencies.

Alabama has also been slow to adopt green building practices. According to the U.S. Green Building Council's (USGBC) government database, as of 2008 Alabama did not have a state green building policy based on the Leadership in Energy and Environmental Design (LEED) standard.¹⁰ Across the State, however, there were 22 certified LEED projects and an additional 124 that were registered as of the printing of this document. These figures roughly compare to Louisiana and Mississippi, but they fall well behind Tennessee, South Carolina, and particularly Georgia, which had 160 projects certified and 661 registered. The State has over 900 LEED-Accredited Professionals (APs), almost half of whom were located in Birmingham.¹¹

The EPA ENERGY STAR for Homes program has shown more promise. As of March 2010, there were 3,236 ENERGY STAR qualified homes built in Alabama, with roughly half of those constructed in 2009. Moreover, of the 55 ENERGY STAR partner builders in the State, 44 have signed up since January 2008. Still, just one large-volume builder based out of Huntsville has built close to half of the ENERGY STAR homes across the State, and the top five ENERGY STAR builders account for almost 80 percent of the

homes built.¹² In addition, ENERGY STAR homes in Alabama account for less than one percent (.003) of the over one million ENERGY STAR homes built across the country since 1995, even though the State population has totaled roughly 1.5 percent during that time.¹³ This data suggests that, in practice, ENERGY STAR for Homes has not had a far-reaching impact yet, but that there is great potential for growth across the State.

EnergyKey is another green homes program that has shown promise in the State. It was developed by ADECA, in partnership with Southface Energy Institute, a building sustainability consulting firm based out of Atlanta that works across the southeast region. The program is a service of the Homebuilders Association of Alabama and is designed by builders, for builders, with a focus on compliance with established energy benchmarks, as well as water and waste reduction.

There are three achievement levels of Energy Key:

- Advanced EnergyKey requires the building to be in compliance with 2006 IECC/2006 IRC energy chapter
- Star EnergyKey requires the building to meet with Energy Star requirements with a Home Energy Rating System (HERS) rater sign off
- Green EnergyKey, the most advanced level, includes a more stringent checklist than the Star EnergyKey and requires a HERS rater sign-off.¹⁴

Currently, there are 77 EnergyKey builders in Alabama.¹⁵ Builders must go through a relatively inexpensive four- to six-hour training program that costs \$100 for Home Builders Association of Alabama (HBAA) members and \$200 for non-members. There are also application fees of \$100-\$300 for qualifying homes, depending on the level of achievement.

Similar to EnergyKey, EarthCraft House provides an additional green homes program available in Alabama. EarthCraft House is a partnership between Southface and the greater Atlanta Homebuilders Association that uses a whole home approach to stress the importance of understanding how the systems of a house work together. The program's guidelines address energy efficiency, durability, indoor air quality, resource efficiency, waste management, and water conservation. There is both a new homes program and a renovations program in which a technical advisor will make recommendations before improvements are made. There are also programs that address communities and multifamily buildings.

To become an EarthCraft House each house must meet the following criteria:

- Meet the ENERGY STAR criteria including achieving passing scores from diagnostic tests for air infiltration and duct leakage
- Must achieve at least 150 points from an EarthCraft scoring sheet
- Select and Premium status are awarded to homes that meet additional criteria and achieve 200 and 230 points

- Must have a pre-drywall Inspection by an EarthCraft House inspector
- Must pass a final inspection by an EarthCraft House inspector.¹⁶

To become an EarthCraft House builder, you must join a local Home Builders Association Chapter, join the EarthCraft House program, attend a one-day EarthCraft House training session, attend a design review and participate in a walk through with EarthCraft House staff. This process costs a total of \$825 (includes Home Builder Association dues). There are currently eleven companies that employ EarthCraft House builders.¹⁷

Incentives for Green Building

ADECA administers multiple incentives related to renewable energy installation and energy efficiency upgrades and appliances. In collaboration with PowerSouth, the Local Government Energy Loan Program offers zero-interest loans of up to \$350,000 for local governments and \$500,000 for school districts for renewable energy systems and energy efficiency upgrades. Participants are required to conduct an energy audit prior to the renovations and submit energy use reports annually to ADECA.¹⁸

In addition to the federal tax credits of up to \$1,500 for home energy efficiency upgrades made available through the Recovery Act, ADECA is granting more than \$4,100,000 in Recovery Act funds through its Residential Energy-Efficient Appliance Rebate Program for rebates on select ENERGY STAR appliances purchased from April 19-May 9, 2010.¹⁹

A number of utilities across the State also offer loan and/or rebate programs to homeowners, building professionals, and other utilities for a variety of energy efficiency measures. Most cover the purchase of heat pumps, furnaces, windows, and other products or home weatherization upgrades and are less than \$1,000. However, the Tennessee Valley Authority (TVA) offers a \$1,000 incentive for participating businesses and homeowners to install renewable energy. TVA will purchase the energy and issue a credit on the participant's utility bill.²⁰ For a full listing, please visit the Database of State Incentives for Renewables and Efficiency website.²¹

In addition Alabama Power works with customers to help them improve the energy efficiency of homes, businesses and communities. The company offers a variety of incentives and pricing options that allow Alabamians to better control their energy costs. Residential financing includes heat pumps and associated water heating, the wiring associated with the installation as well as the option to combine a new heat pump installation with home weatherization that is included in the financing package. Included in the weatherization option are double-paned windows (up to \$300 each), low-E or tinted double-pane windows (up to \$350 each) humidifiers, dehumidifiers, air cleaners and duct cleaning. The web site offers guides and energy saving tips that stress the importance of heat pumps, proper duct insulation and programmable thermostats. The company gives people the opportunity to tour its virtual efficient home online to learn about the many facets of a home that can help customers to save energy.

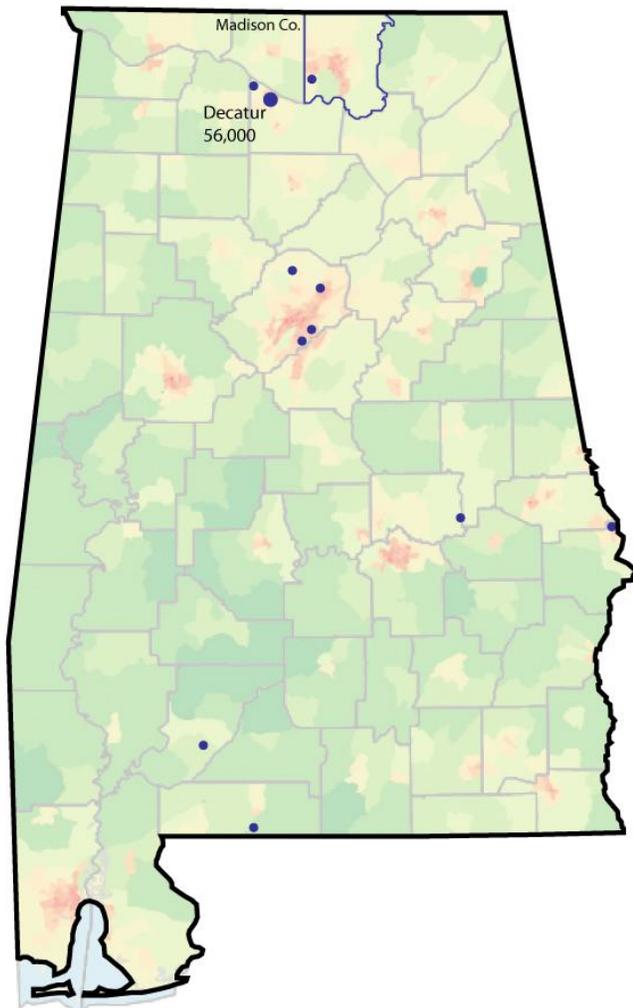
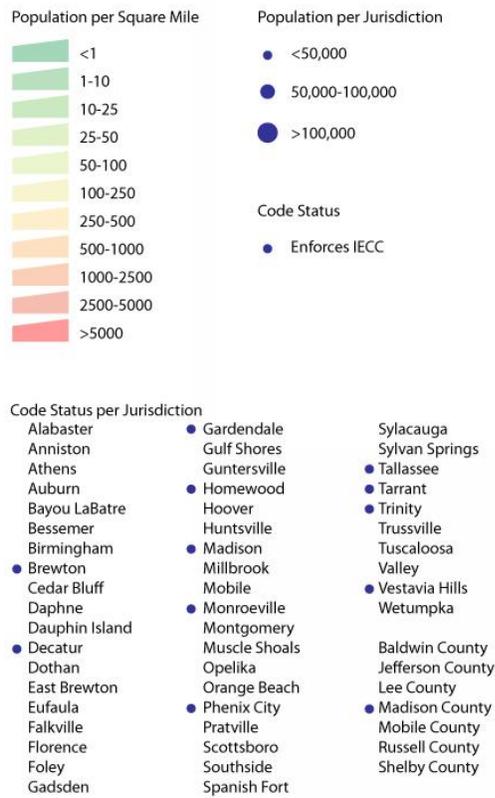
They also offer an ‘energy check up’ that gives customers the ability to learn how to save energy through a free online analysis of a home’s energy use.

Local Policy

IECC

Although Alabama has a population of over 4.6 million and a number of large urban centers, much of the State is rural, and many of these communities do not have mandatory building codes. Of the roughly 460 municipalities in the State, the ICC lists only 48 cities and seven counties as having adopted any versions of the I-codes, although most of the 460 municipalities not on this list are small rural communities.²²

Figure 2
Building Energy Code Status in Alabama
 By Jurisdiction, Compared with Population



Density Map and Populations courtesy of U.S. Census Bureau
 Census 2000 Summary File 1 Population by Census Tract
 Population Estimates as of July 1, 2007

As Figure 2 shows, 11 cities and one county have adopted an edition of the IECC. Homewood and Tarrant are the only cities that have adopted the most recent energy code, the 2009 IECC. Brewton, Phoenix City, and Vestavia Hills each operate under the 2006 IECC, and the remainder have the 2003 version or earlier. Moreover, these jurisdictions account for a small percentage of the State’s total population. Decatur is the only city in this group with more than 50,000 residents. Although Huntsville falls within Madison County, it does not fall under the county inspection department’s jurisdiction.

IBC or IRC

A number of communities in Alabama choose to adopt the International Building Code (IBC), which covers commercial construction. The IBC’s Chapter 13 references the IECC, which, in turn, references ASHRAE Standard 90.1-2007 as an alternative compliance path. In theory, then, the IBC is equivalent to the IECC and Standard 90.1. However, it is difficult to make this claim because many of the municipalities in Alabama that adopt the IBC eliminate Chapter 13 or choose not to enforce it by not also adopting the IECC. Therefore, in practice, adopting the IBC is not equivalent to adopting the IECC. Without assurances that a community enforces Chapter 13, it is more accurate to err on the side of caution and assume that it does not.

For single-family residential construction, the situation regarding energy code adoption looks a little more promising when you include the IRC. Chapter 11, the energy efficiency chapter, references the IECC as an alternative compliance path, yet it also includes prescriptive energy efficiency requirements that are slightly less stringent than the IECC. This gives the building and design industries the option of taking an easier compliance path, which reduces these codes’ impact on energy savings as compared to the IECC.

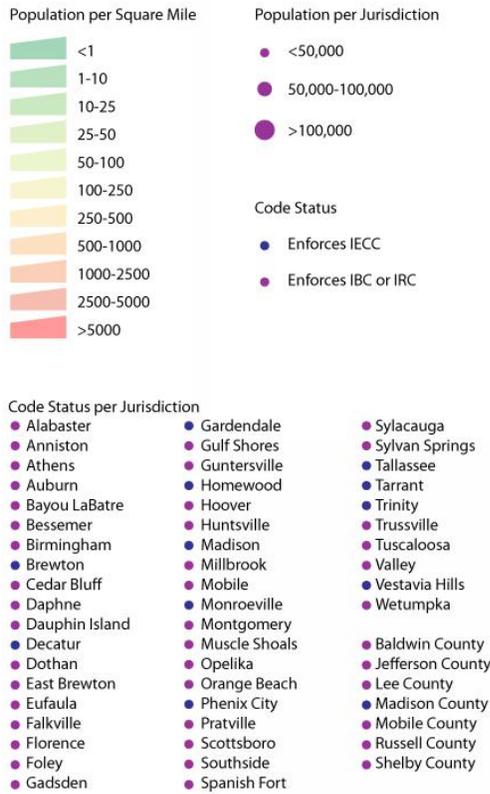
IECC vs. IRC

The 2009 International Residential Code (IRC) is not equivalent to the 2009 IECC. Alabama must add a number of amendments to bring the 2009 IRC up to 2009 IECC standards. These include:

- Strengthening fenestration and insulation requirements
- Eliminating trade-off allowances
- Adding new air barrier and insulation checklists
- Redefining “conditioned space”
- Adding “mandatory,” “prescriptive,” and “performance” labels in the code
- Exempting only “building thermal envelope provisions that do not contain conditioned space”

Figure 3

Building Energy Code Status in Alabama
By Jurisdiction, Compared with Population



Density Map and Populations courtesy of U.S. Census Bureau
Census 2000 Summary File 1 Population by Census Tract
Population Estimates as of July 1, 2007

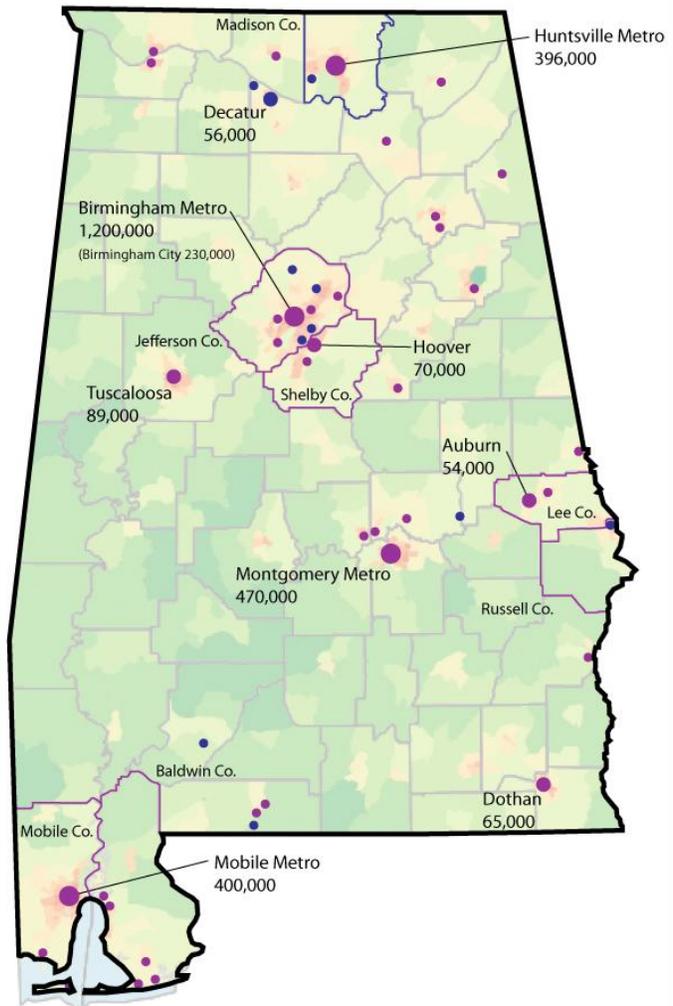


Figure 3 shows all of the cities and counties in the State that have adopted the IBC, IRC, and/or IECC. It is important to note that the municipalities with an energy code identified on the map correlate strongly with the State’s population centers, while the areas without energy codes are largely rural. In fact, roughly half of the total population is covered by one of these codes.

Figure 4

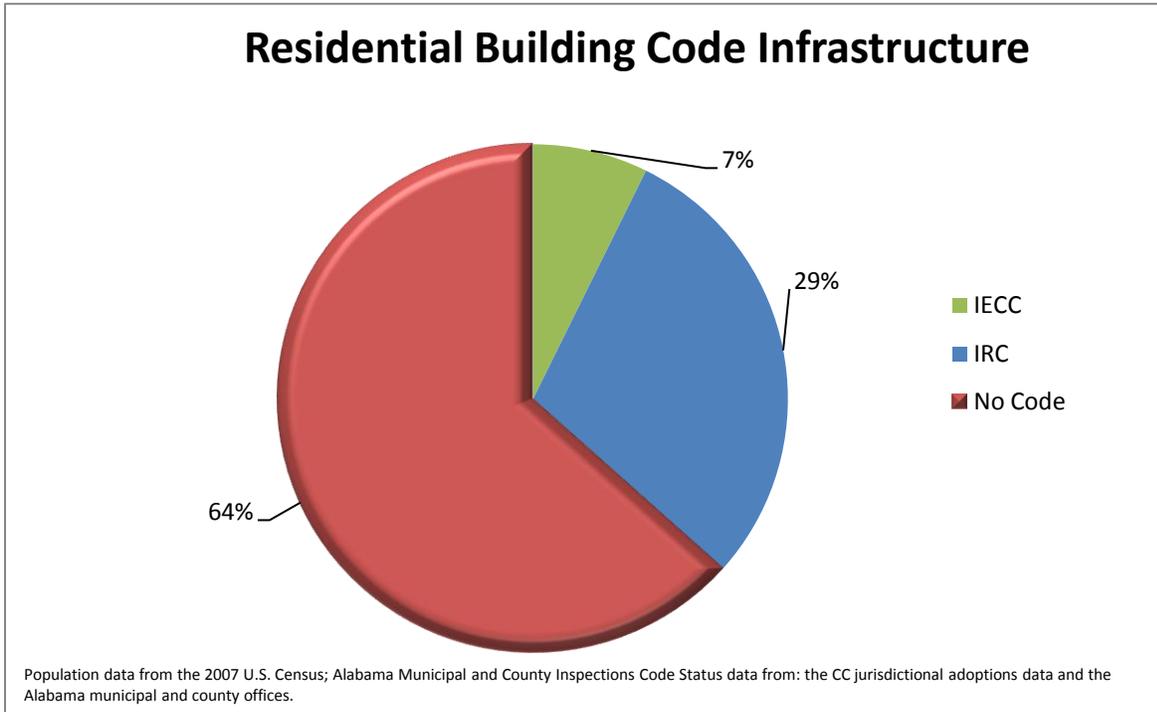
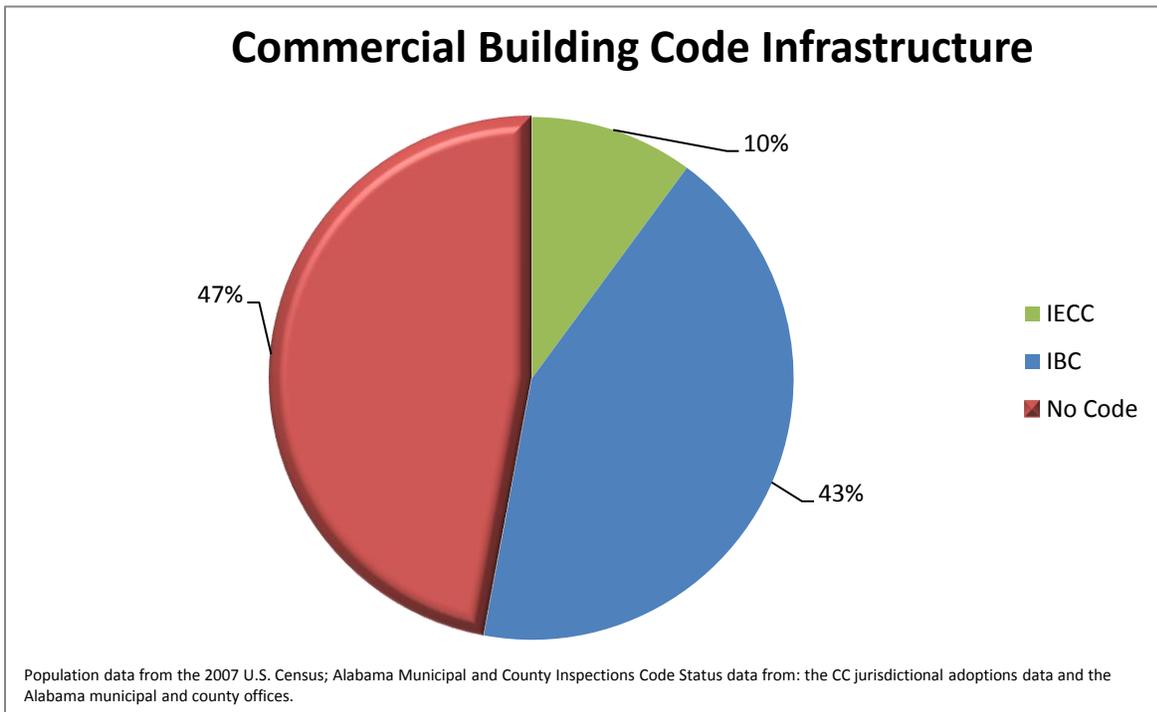


Figure 5



Figures 4 and 5 show the percentage of Alabama's population covered by a building code. In the residential sector, seven percent of the population is covered by the IECC, 29 percent is covered by the IRC, and 64 percent is not covered by a residential building code at all. In the commercial sector, ten percent of the population is covered by the IECC, 43 percent is covered by the IBC, and 47 percent of the population has no commercial code infrastructure at all. In this case, it is assumed that 36 percent of the residential sector has an energy code and that only 10 percent of the population is covered by a commercial building energy code using the conservative assumption that chapter 13 of the IBC is eliminated in most municipalities.

Adoption in the Five Jurisdictions

BCAP will work with five local jurisdictions in Alabama (Auburn, Birmingham, Huntsville, Mobile, and Montgomery) to explore the energy codes situation on the ground. BCAP will develop and implement a Policy Action Kit in these locations and support ADECA in providing funding for sustained energy code support activities. The Policy Action Kit will be tailored to aid a city, town, or county administrator and will detail specific solutions to improve codes and compliance in their jurisdictions. This six-part Kit will guide and equip local administrators with the necessary knowledge to adopt and enforce the 2009 IECC and ASHRAE 90.1-2007 within their jurisdictions. The Kit will be an effective and useful guide in transporting the State up to the 90 percent compliance requirements under the Recovery Act.

Code adoption in the five cities is representative of adoption across the State for cities and larger towns. None of the five communities has adopted the IECC, but each has some version of the IRC and IBC. Auburn leads the way, having updated to the 2009 IBC and a number of other I-codes in March 2010, although it still follows the 2006 IRC. Birmingham, Huntsville, and Montgomery each enforce the 2003 IRC and 2003 IBC, while Mobile enforces the 2000 IRC and IBC.

Local Climate/Green Initiatives

Alabama cities are not much further along than the State in adopting climate change plans and green building initiatives. None of the five largest cities in the State (Birmingham, Montgomery, Mobile, Huntsville, and Tuscaloosa) has a comprehensive climate change mitigation plan. According to the USGBC, there are also no municipal LEED-based green building policies in Alabama.

Still, a number of cities in the State have taken steps to improve their environmental performance. In 2009, Birmingham, Hoover, and a number of other cities created the Alabama Green Initiative (AGI), a non-profit organization dedicated to helping all member municipalities in Bibb, Blount, Chilton, Jefferson, Shelby, St. Clair and Walker counties apply for and receive grants for environmental and sustainability projects through the Recovery Act.²³

Seven cities in Alabama (Auburn, Bessemer, Huntsville, Opelika, Selma, Troy, and Tuscaloosa) have also signed on to the U.S. Conference of Mayors' Climate Protection Agreement. Signing this agreement signals a commitment to enact policies and programs that meet or exceed a greenhouse gas emissions

reduction target of seven percent below from 1990 levels by 2012.²⁴ Moreover, Calhoun County is a member of the ICLEI-Local Governments for Sustainability, an international association of local governments committed to sustainability.²⁵

Enforcement

Standard of the Community

Building code enforcement suffers in Alabama due to the patchwork nature of municipal building code adoption in the State. In general, the cities and larger towns that have adopted building codes have inspection departments with code officials who conduct permit reviews, on-site inspections, etc. Smaller towns, particularly in rural areas, often lack adopted codes to enforce or enough permit fees to afford a code inspector. Some of these rural localities group together to contract a code official from an inspection department in a surrounding community. A small number of county inspection departments also enforce building codes in smaller communities and unincorporated areas. As is often the case, however, these places simply do not enforce any building codes for new construction or renovations.

While it appears that a mandatory, uniform energy code may be on the horizon, as described above, current state law requires that inspectors enforce to the standard of the community. Yet the standard of the community often changes from one town to the next, depending on which code (IECC, IRC, or IBC) and edition it enforces. For inspectors working in multiple jurisdictions, the lack of a uniform standard causes confusion and can lead to inspection inconsistencies and oversights. This is also true for building professionals, particularly those who work across multiple jurisdictions, as they must change building practices and materials from one community to the next. This can cause confusion and compliance errors, whereas a uniform energy code levels the playing field for everyone in the design and construction sectors.

The situation is even more difficult when the community does not have a standard, in which case the builder and the client determine the level of energy efficiency in the building. Naturally, this often leads to structures that do not meet the stringency of the national model code, as consumers are rarely informed about the benefits of energy-efficient construction. In many places, the same is also true for building professionals, who focus on traditional building concerns without realizing the implications energy efficiency has on the life, health, and safety of the building and its occupants. Moreover, without a mandatory standard and a consumer-driven demand for energy-efficient buildings, many industry professionals construct buildings with the lowest up-front costs, as opposed to the lowest lifecycle costs, thereby raising their profits at the expense of their clients.

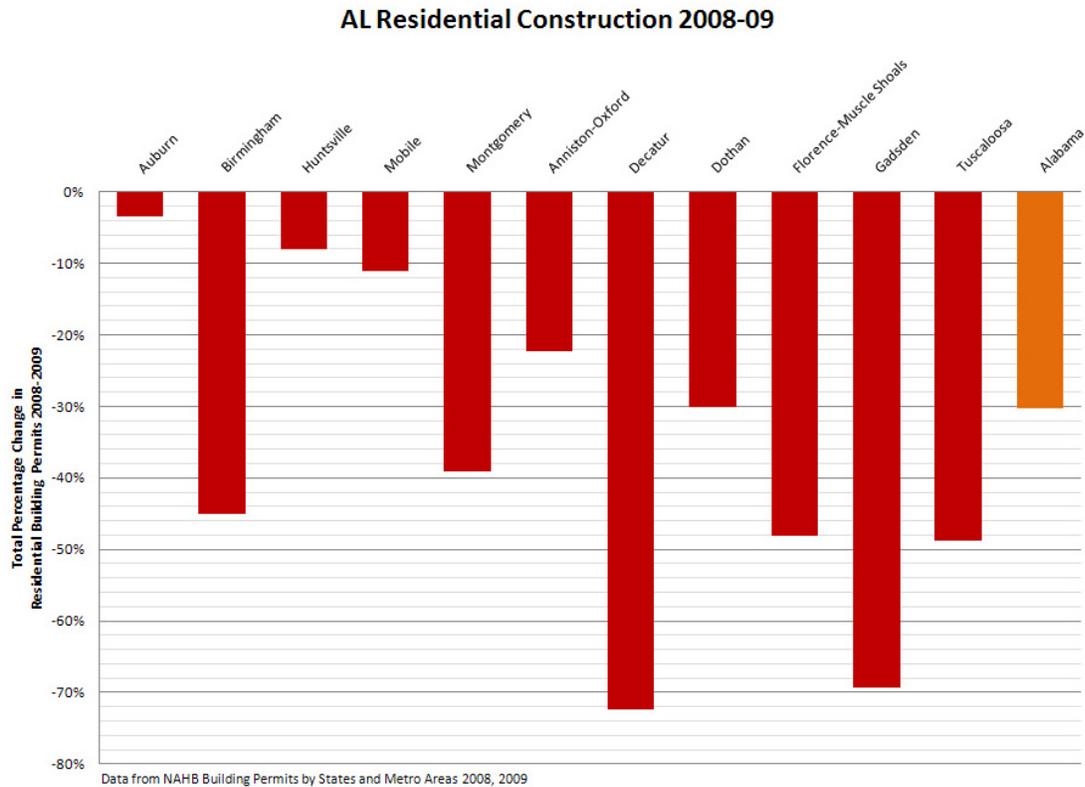
Enforcement Issues

Furthermore, there is no guarantee that a community that has adopted an energy code will be willing or able to enforcement it. According to code officials in the State, a number of common themes emerge for why energy code enforcement falls far behind the enforcement of other building codes:

Resources: The majority of local building departments in Alabama are understaffed and overworked, and for some, the burden of supporting the energy code is not feasible. These departments simply lack the resources and time required to give the energy code equal status and attention as the traditional

life, health, and safety codes. As Figure 5 demonstrates, there was a decline in permitting by 30 percent from 2008 to 2009. With fewer houses to inspect, inspection departments receive less money in permit fees. The situation has deteriorated such that many inspection departments have already had to let go of staff, and for others it is still an ever-present possibility. However, this downturn presents an opportunity as contractors who are typically overwhelmed with work, may now have time for training.

Figure 5



Familiarity and Background: Trained to enforce traditional building codes, many code officials are unfamiliar with energy issues and view them as secondary concerns. They do not understand how energy codes improve the life, health, and safety of buildings and occupants. Many inspection departments that enforce the IRC and/or IBC do not enforce the energy chapters because they have not had much, if any, training on the energy efficiency requirements, or their practical application in building plans or on the construction site. Familiarity is of particular concern for enforcing the energy efficiency requirements for commercial construction. Most code inspectors in Alabama deal primarily with residential construction, and few inspection departments have the resources to allow one or more inspectors to specialize in commercial construction.

Moreover, the majority of code officials enter the field after working in construction as builders, contractors, and other similar positions. Logically, they bring with them specific expertise and skills from

their previous careers, such as mechanical and HVAC systems, plumbing, fenestration, etc. As a result, many code inspectors tend to focus on the areas of construction with which they are the most familiar. Since few, if any, code inspectors in the State come from a building energy efficiency background, fewer enter their new positions as code inspectors with a clear understanding of energy efficiency provisions and years of relevant experience in that area. This is particularly relevant for code inspection departments with inspectors who specialize in one or two aspects of the building codes, but must also include energy efficiency into their work on the side.

Priority: The responsibility for energy code enforcement ultimately falls on the local inspection departments. Yet proper enforcement requires a commitment to building energy efficiency from all interested stakeholders, from code officials and builders to city councils and the State legislature. State and local policymakers must support local inspection departments with the knowledge, training, and tools they need to enforce the energy code, as well as provide the design and building industries with similar support so that they can understand and be able to comply with the requirements of the code. If energy codes are not or cannot be a priority for all involved parties, simply put, energy code enforcement will continue to suffer.

The State and its local jurisdictions have struggled to find the funding needed to carry out such comprehensive efforts, particularly given the difficult economic climate. In light of the unprecedented federal funding made available in the Recovery Act, though, now is the time to establish or expand existing energy code enforcement infrastructures, with a focus on practical and feasible systems that will remain sustainable once federal funds are no longer available.

Certification Process

A further difficulty for enforcing energy codes in Alabama is that the State does not have a uniform building code official certification process, nor does it have a standard for maintaining certification through continuing education units (CEUs). Rather, each municipality sets its own requirements for becoming a building inspector and staying up-to-date with changes to the building codes. Many jurisdictions require that code officials receive their certification from the ICC, although this policy is not across-the-board. Some train new code officials in-house through observing site-plan reviews, ride-along site-inspections, etc.

For many of the same reasons as with energy code adoption and enforcement, the lack of a uniform process creates inconsistencies between jurisdictions and even within code inspection departments. Each code inspector brings a different set of skills and training to a site plan review or on-site inspection. While most code inspectors are qualified to enforce building codes—although often not the energy code—the lack of a uniform standard prohibits the State from determining the minimal qualifications needed and regulating the industry to ensure basic proficiency with interpreting the adopted codes.

Third-Party Enforcement

While enforcement of the adopted energy codes is often lacking, Alabama is developing a third-party enforcement and verification infrastructure to complement its growing above code residential building industry. The Residential Energy Services Network (RESNET) provides federally recognized third-party rating standards for building energy performance. Its website allows homeowners to learn about energy audits and rating processes, as well as easily locate certified energy auditors, raters, and qualified contractors and builders. According to RESNET, there are currently 11 certified HERS raters in Alabama.²⁶ Raters must complete the required RESNET energy training to be included on this list. In addition to the qualified professionals on RESNET, Energy Star lists thirty companies and organization that employ qualified raters in Alabama.²⁷

Education/Training

It should be no surprise that cities with low levels of energy code adoption usually lack adequate education and outreach, just as states with low levels on enforcement usually lack adequate training—both of which are the case in Alabama. While a number of stakeholders in the region have begun to address these deficits in recent years, Alabama still suffers from a culture of disinterest in energy efficiency provisions and a general mistrust of what many—though not all—in the building and enforcement communities see as unnecessary overregulation or government intrusion into private industry. To address the large gaps in energy code adoption and enforcement, energy code advocates in the State must counteract these attitudes with education regarding the value that energy codes provide for consumers, businesses, and society and training for both the building and inspection communities on how to enforce and comply with the provisions of the energy code.

For Code Inspectors

Energy code education and training begins with the code inspection community, as they are responsible for enforcing the provisions of the adopted codes. The Code Officials Association of Alabama (COAA) and its seven chapters throughout the State offer members multiple statewide building code trainings per year, including the annual conference. However, energy efficiency is only one of the many building topics covered at these workshops, as their primary purpose is to serve as a means for code officials to maintain a certain number of CEUs, often done through the ICC process. Furthermore, COAA has limited resources with which to host training sessions.²⁸

In speaking with building code officials, the most commonly cited issue surrounding training for energy code enforcement is a lack of funding. Even though the State does not have a uniform process for code official certification, many building inspectors either want to receive training and earn CEUs or are required to by their municipality. Already understaffed, many inspection departments cannot afford for inspectors to take time out of their schedules to receive training, nor can they afford the funds required to pay the additional expenses for travel, room, board, and training fees where applicable. With the sharp reduction in building permit fees over the last year, the ability to attend codes workshops will become an even greater issue for the foreseeable future.

Related to this issue is a lack of regional trainings. Alabama is a sufficiently large state that many code officials, particularly in rural areas away from large urban centers and without easy access to highways, must travel long distances to attend codes workshops. Longer trips require more time and finances, which reduces the likelihood that the code official will be able or willing to make the trip. These issues apply to building professionals, as well, although often to a lesser extent.

For Building Professionals

Unlike code officials, building professionals must go through a statewide certification process. Homebuilders apply for certification through the Home Builders Licensure Board (HBLB), which requires

builders to pass a credit report and an examination, currently based on the 2006 IRC.²⁹ Architects, engineers, and commercial developers must apply through the Alabama Licensing Board for General Contractors, which also requires that members pass a financial assessment and an examination.³⁰ Electrical, plumbing and gasfitters, and HVAC contractors each have to apply through their own specific boards, each with their own similar qualifications.

Commercial developers, architects, and engineers must maintain their certifications with CEUs. However, the HBLB does not require the same for home builders. Still, HBAA and its local chapters provide members with training sessions through the National Association of Home Builders (NAHB). HBAA also responds to consumer complaints, often requiring additional educational training and fines for culpable home builders. Generally, these sessions do not cover energy efficiency requirements, but rather common construction problems and business issues.

Still, HBAA attempts to be proactive in providing trainings that will be relevant to its members. In the past few years, it has held trainings on weatherization and green building through the EnergyKey program, and it is currently planning its first green building conference. While these opportunities do not signal a tipping point in overcoming the economic and cultural attitudes towards energy-efficient design and construction prevalent throughout Alabama, they do indicate the beginnings of a shift in outlook within the relevant stakeholder groups in the State, one that can also be seen in the burgeoning above code residential building sector and recent state legislation.

Additional Education and Training Options

As a much-needed supplement to the local trade association trainings across the State, a number of national, regional, and local organizations have also provided outreach and training on the requirements of the energy code and advanced codes in Alabama which are typically funded by ADECA through DOE. Southface, BCAP, ICC, and Auburn University's School of Building Science, have each held workshops on a number of building science and energy code topics during the last few years for the design, building, and inspection industries.

As a continuation of these efforts, Alabama is taking advantage of the SEP funds available through the Recovery Act to improve energy code enforcement and compliance across the State. In conjunction with a number of building science organizations throughout the State, ADECA is sponsoring a series of energy code training workshops in 2010 through Southface. Multiple ADECA workshops will be available in Auburn, Birmingham, Huntsville, Mobile, Montgomery, and Tuscaloosa, divided into four separate topics:

- Residential Energy Code: This workshop will cover the 2006 and 2009 IECC and includes a three-hour in-class session and an in-field training session. During the training, participants will learn how basic building science contributes to the IECC and the structure and details of both editions of the code. The training will also include information on green building market drivers such as

LEED, Energy Star, Home Energy Rating, Building Performance Institute (BPI) Certification, and the 2030 Climate Challenge. The workshop is targeted at a diverse audience and although the in-field session is typically for code officials, it is open to all.

- Commercial Energy Code: This workshop will cover how to implement ASHRAE Standard 90.1-2007 and the minimum energy standard accepted by the USGBC's LEED green building certification program. The workshop addresses compliance, building science basics, strategies to improve building envelope and a tutorial on the use of COMcheck software provided by the DOE. The workshop is targeted at design and construction professionals and trade association members, affordable housing advocates and practitioners, building product manufacturers, distributors and vendors, building code officials, and policymakers.
- High Performance Building Design: This workshop is targeted to design and construction professionals but is open to anyone and addresses strategies for new high-performance building design and major energy upgrades to existing facilities. The session will include overviews of LEED, ENERGY STAR, the 2030 Climate Challenge and the ASHRAE Energy Design Guides. This workshop is a full day of training and works in conjunction with the High Performance Building: Commissioning, Operations and Maintenance Workshop. The two sessions are offered together on successive days.
- High Performance Building Commissioning, Operations and Maintenance Workshop: This workshop is designed to work in conjunction with the High Performance Building Design session to address the necessity of properly operated and maintained building systems. The day-long session teaches the factors that can adversely affect building performance, how to diagnose and address poor building performance, and how to track and improve building energy results.

Each individual workshop costs \$50, but the cost of attending both High-Performance Building workshops is \$75. More information can be found on the Southface website.³¹

Recommendations

ADOPT AN ENERGY CODE

- ❖ **Background:** Created through the Alabama Act 2010-185, the Alabama Energy and Residential Codes Board must meet to adopt the 2006 IECC and ASHRAE Standard 90.1-2007, as directed by the legislation. These codes should be adopted and applied statewide with limited amendments.
- **RECOMMENDED ACTION:** The Board should address the following issues:
 - The Board should allow municipalities in Alabama to go above code. However, if the Board decides that the legislation prohibits this, it should undertake an effort to amend the legislation during the 2011 legislative session.
 - The Board should determine who is responsible for energy code adoption and enforcement in unincorporated areas of the State.
 - New legislative acts should change state laws governing local enforcement to allow jurisdictions to charge fees to cover the costs of enforcement.
 - ADECA has been central to energy code adoption and implementation efforts in the past and is the logical agency to house the Board and continue its outreach efforts.
 - Outreach should consist of a comprehensive statewide plan that includes training for builders, inspectors, and the design community, and also provides advocacy and education to state and local government officials.
 - The outreach plan should pay special attention to information delivery and the unique implementation issues in rural/unincorporated areas of the State.

BUILD PROFESSIONAL CAPACITY

- ❖ **Background:** The State of Alabama needs to create an environment that regulates professional trades in the State. The credentialing of professionals assures a minimum amount of education in energy efficiency for the entire construction industry.
- **RECOMMENDED ACTION:** The State of Alabama should work with design professionals and builders to improve their familiarity with energy codes to ensure that new residential and commercial buildings are built to the highest standard of quality and energy efficiency.
 - Architects, engineers, and commercial developers must apply through the Alabama Licensing Board for General Contractors. The State could use this avenue to assure that energy efficiency is a required focus area of education and certification.
 - Likewise, the State could develop a statewide code inspector certification program. This could consist of a certification board or equivalent, which oversees the credentialing and continuing education credits of code enforcement officials and covers trades, such as HVAC, Plumbing, Electric as well as Energy Efficiency, to assure that energy efficiency is a required education area.

- The State could require that the HBLB ensure energy efficiency is a requirement of licensing.
- Code officials and contractors should be required to be recertified every few years, or soon after energy codes are altered.
- The State could subsidize tuition for energy efficiency credentialing.
- The State could offer code training in technical and community colleges as an easy way to expand training infrastructure and reach more professionals in the construction industry. A good example is Midlands Technical College in South Carolina. This school offers a variety of IECC code training courses.³² There are nine community colleges in Alabama that offer relevant building and construction programs. The State should work to incorporate code training into these programs to build a network of training centers across Alabama.

IMPLEMENTATION

- ❖ **Background:** A variety of national stakeholder organizations have recently conducted multiple studies on a number of new approaches and innovative methods for improving compliance rates, including testing or piloting a few of them. The State needs to create a plan for tracking compliance as required by DOE, to show a 90 percent compliance rate to the energy code.
 - **RECOMMENDED ACTION:** Recommendations for improving communications with, and training of, code enforcement officials and the building community should be made in cooperation and collaboration with key partners to ensure recommendations are compatible with state goals and priorities and reflect current and projected staffing and resources, and in consideration of unique local code infrastructure challenges.
 - The State could create evaluation methodology and work with three or more jurisdictions to pilot a compliance tracking program and assessment following DOE's guidelines for evaluation and measurement. Examples of states that have designed compliance methodologies are Florida, California, and Texas. The EnergyGauge enhancement pilot in Florida created a computerized system to provide "intelligent" screening for building code compliance processes. In California, future plans for the *Online Learning Center* include form submission and compliance data mining using their code college network site. The Texas State Energy Office (SEO) and Texas A&M University have developed software and a data collection system called *IC3* and have piloted this system in the City of Austin.
 - The State could provide design assistance to professionals wishing to assure that their design meets the energy code. The State could also encourage manufacturers to provide such assistance to design professionals to demonstrate various compliance techniques and/or materials. The State can utilize manufacturers as training partners to address many of the energy code compliance features of a building. They can provide assistance, encourage principles of better building, and promote energy-efficient products. The State could also provide plan reviews for complex buildings, making state plan reviews for energy code mandatory before issuing a permit as a way to ensure compliance.

- Circuit rider training or mobile training units can provide targeted educational support and training to code officials and construction professionals in their offices and on jobsites. Many building professionals learn better in small groups with hands-on training. The Community Energy Efficiency Management (CEEM) approach will soon be piloted in New York State. It will rely on codes experts to assess energy savings potential for buildings, develop plans to fund and achieve energy savings, and provide on-the-ground support to code enforcement officials in one or more communities. This project will eventually be expanded statewide.
- The State can establish an Energy Code Ambassadors Program (ECAP). Recently launched as a pilot by the ICC and BCAP, ECAP provides a forum for expanding energy codes expertise while delivering assistance to local codes officials. ECAP will train and certify energy code “Ambassadors” in four pilot states through local chapters of ICC across the State. The Ambassadors will act as regional energy code “mentors” to other code officials, helping to resolve questions on codes interpretation, share information on enforcement procedures, etc.
- Trade allies such as building material and HVAC suppliers often offer code advice on building code issues to their customers: builders, contractors, developers, and designers. This could also be offered in the form of a compliance service program for energy codes, and be fee-based for program sustainability.
- The State should improve upon existing materials, information, and resources. Compliance forms and checklists can be critical tools to assist code officials and builders through the permit process. Creating a checklist and a one-pager to be stapled to each residential permit that is made can simplify the work for code officials and builders. These materials can also be placed on a website and handed out during training. This program can be modeled after the RECA State Guides, but specific to each climate zone.³³ The State can provide jurisdictions with codebooks. Alabama should identify needed updates to existing manuals and reference materials to ensure that critical information on the model energy code, the latest building science techniques, and best practices are included and updated periodically.
- Providing online resources is an important strategy to improving information flow and access to educational materials. BCAP has developed the Online Code Environment and Advocacy Network (OCEAN) which includes state-specific resource pages. Also recommended is the use of other resources such as the “IECC Online Commentary,” a video resource that presents advanced techniques and “takes the viewer to the jobsite.”³⁴ The Pacific Northwest National Labs offers resources for training and technical assistance on energy codes including web-based training and webinars.³⁵ The Code College Network offers state specific online training for the construction industry and can be tailored as a pay-per-view and credentialing tool.³⁶ These and other innovative resources can provide the codes community with much-needed compliance assistance through new mediums that

allow widespread access to information that is presented in new formats for a variety of audiences.

References

- 1 http://tonto.eia.doe.gov/energyexplained/index.cfm?page=us_energy_use
- 2 http://tonto.eia.doe.gov/state/state_energy_rankings.cfm?keyid=60&orderid=1
- 3 http://tonto.eia.doe.gov/state/state_energy_rankings.cfm?keyid=29&orderid=1
- 4 http://tonto.eia.doe.gov/state/state_energy_profiles.cfm?sid=AL
- 5 http://www.energy.gov/media/Riley_Alabama.pdf
- 6 <http://www.adeca.state.al.us/C7/SEP-ARRA/default.aspx>
- 7 <http://www.bc.alabama.gov/buildingcode.htm>
- 8 <http://adph.org/facmgmt/Default.asp?id=1173>
- 9 <http://www.aldoi.gov/PDF/FireMarshal/Reg482-2-101.pdf>
- 10 <http://www.usgbc.org/DisplayPage.aspx?CMSPageID=1852>
- 11 <http://www.usgbc.org/LEED/Project/CertifiedProjectList.aspx>
- 12 http://www.energystar.gov/index.cfm?fuseaction=new_homes_partners.showAreaResults&s_code=AL&msa_id=al
- 13 <http://www.census.gov/popest/states/NST-ann-est.html>
- 14 http://www.energykeyhome.com/how_it_works.html
- 15 http://www.energykeyhome.com/energykey_builders.php
- 16 <http://www.earthcrafthouse.com/About/criteria.htm>
- 17 <http://www.earthcrafthouse.com/Find-builder/find-a-builder.htm>
- 18 <http://www.adeca.alabama.gov/C3/Local%20Government%20Energy%20Loan%20P/default.aspx>
- 19 <http://www.adeca.alabama.gov/C19/EEARP/default.aspx>
- 20 <http://www.dsireusa.org/incentives/index.cfm?CurrentPageID=1&State=AL&RE=1&EE=1>
- 21 <http://www.dsireusa.org/incentives/index.cfm?CurrentPageID=1&State=AL&RE=1&EE=1>
- 22 <http://www.iccsafe.org/gr/Documents/al.htm>
- 23 <http://thicketmag.com/content/?p=411>
- 24 <http://www.usmayors.org/climateprotection/ClimateChange.asp>
- 25 <http://www.iclei.org/index.php?id=global-members>
- 26 <http://resnet.us/directory/auditor/al/29/find-raters-auditors/1>
- 27 http://www.energystar.gov/index.cfm?fuseaction=new_homes_partners.showStateResults&s_code=AL
- 28 <http://www.coaa.com/>
- 29 <http://www.hblb.alabama.gov/content/applicants/howtogetlicensed.aspx>
- 30 <http://genconbd.alabama.gov/Default.htm>
- 31 <http://www.southface.org/learning-center/trainings/alabama-workshop-series#rec>
- 32 <http://mtconline.midlandstech.edu/CeClassCatalog/scheduleopen?v=SCEWEZ>
- 33 <http://reca-codes.org/>
- 34 <http://www.iccsafe.org>
- 35 www.energycodes.gov
- 36 www.codecollegenetwork.com