Alaska Gap Analysis

November 2012

Prepared by the Building Codes Assistance Project for Alaska Housing Finance Corporation

BCAP Dedicated to the adoption, implementation, and advancement of building energy codes

Alaska Housing Finance Corporation

CCHRC Cold Climate Housing Research Center
The Building Codes Assistance Project (BCAP)

The Building Codes Assistance Project (BCAP) is a nonprofit 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 is headquartered at the Alliance to Save Energy in Washington, D.C. with satellite staff in Albany, New York and Toledo, Ohio.

BCAP strives to be the premier resource for energy code support, coordination, technical assistance, news and information. Our mission is to reduce the energy consumed in the construction and operations of buildings by working with national, state, and local governments and other stakeholders to promote the adoption and implementation of building codes and standards.

Through funding from the U.S. Department of Energy, BCAP partnered with the Alaska Housing Finance Corporation as part of the Compliance Planning Assistance (CPA) Program, through which BCAP works with states to help them take practical steps towards achieving full compliance with the model energy codes.

The CPA Program is divided into two phases:

1. **Gap Analysis Report**: Documents the state’s existing energy code infrastructure to assess the current gaps, identify best practices, and offer initial recommendations for improvement.

2. **Strategic Compliance Plan**: Develops targeted, state-specific plan with practical near- and long-term action items to move the state towards full energy code compliance.

This Alaska Gap Analysis Report and the Alaska Strategic Compliance Plan (also published in November 2012) work in tandem to help stakeholders consider the policy recommendations of the Gap Analysis and put them into action as described in the Strategic Compliance Plan. Together the report and the presents tasks within various focus areas that state agencies, local jurisdictions, and other stakeholders can take to achieve full compliance with the model energy codes.

This report was prepared with the support of the Alaska Housing Finance Corporation and the U. S. Department of Energy. Any opinions, findings, conclusions, or recommendations expressed herein are those of the authors(s) and do not necessarily reflect the views of the Alaska Housing Finance Corporation or the U.S. DOE.
# TABLE OF CONTENTS

Acronyms and Abbreviation .................................................................................................................. 5

EXECUTIVE SUMMARY ......................................................................................................................... 6

INTRODUCTION ..................................................................................................................................... 9

NATIONAL PERSPECTIVE ON ENERGY CODES .................................................................................. 11

Federal Policy ....................................................................................................................................... 13

EPAct ...................................................................................................................................................... 13

ALASKA STATE OVERVIEW ................................................................................................................. 13

Land Ownership and Governance .................................................................................................... 15

Construction Overview ...................................................................................................................... 18

ALASKA’S Energy Portfolio .................................................................................................................. 20

Political Environment .......................................................................................................................... 22

Recent Relevant State laws .................................................................................................................. 23

Climate Plans ....................................................................................................................................... 25

Stakeholders ......................................................................................................................................... 26

ALASKA’s ENERGY CODE ..................................................................................................................... 27

History ................................................................................................................................................ 28

COST & Potential Savings from Energy Codes .................................................................................. 29

CODE ADMINISTRATION AND ENFORCEMENT ............................................................................... 33

Adoption Process .............................................................................................................................. 34

Division of responsibilities .................................................................................................................. 34

Local energy code adoption ............................................................................................................... 36

State owned Buildings ....................................................................................................................... 40

Outreach ............................................................................................................................................. 41

ENFORCEMENT ................................................................................................................................. 42

Enforcement for BEES ...................................................................................................................... 42

ENERGY CODE Enforcement for non-BEES structures .................................................................. 43
### ACRONYMS AND ABBREVIATION

<table>
<thead>
<tr>
<th>Acronym</th>
<th>Full Form</th>
</tr>
</thead>
<tbody>
<tr>
<td>AEA</td>
<td>Alaska Energy Authority</td>
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<tr>
<td>AHFC</td>
<td>Alaska Housing Finance Corporation</td>
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<tr>
<td>AIA</td>
<td>American Institute of Architects</td>
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<tr>
<td>APA</td>
<td>Alaska Power Association</td>
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<tr>
<td>ARRA</td>
<td>American Recovery and Reinvestment Act of 2009</td>
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<tr>
<td>ASHBA</td>
<td>Alaska State Homebuilding Association</td>
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<tr>
<td>ASHRAE</td>
<td>American Society of Heating, Refrigeration, and Air-Conditioning Engineers</td>
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<td>BCAP</td>
<td>Building Codes Assistance Project</td>
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<tr>
<td>BECP</td>
<td>Building Energy Codes Program</td>
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<td>BEES</td>
<td>Building Energy Efficiency Standard</td>
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<td>CCHRC</td>
<td>Cold Climate Housing Research Center</td>
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<tr>
<td>CEU</td>
<td>Continuing Education Unit</td>
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<tr>
<td>CPA</td>
<td>Compliance Planning Assistance (CPA) Program</td>
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<tr>
<td>DCCED</td>
<td>Department of Commerce, Community and Economic Development</td>
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<td>DEED</td>
<td>Department of Education and Early Development</td>
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<td>DFLS</td>
<td>DFLS Division of Fire and Life Safety</td>
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<td>DOE</td>
<td>U.S. Department of Energy</td>
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<td>DOLWD</td>
<td>Department of Labor and Workforce Development</td>
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<tr>
<td>DPS</td>
<td>Department of Public Safety</td>
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<tr>
<td>EECBG</td>
<td>Energy Efficiency and Conservation Block Grants</td>
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<tr>
<td>EIA</td>
<td>U.S. Energy Information Administration</td>
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<td>EPA</td>
<td>U.S. Environmental Protection Agency</td>
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<tr>
<td>FHA</td>
<td>Federal Housing Administration</td>
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<tr>
<td>IBC</td>
<td>International Building Code</td>
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<tr>
<td>ICBO</td>
<td>International Conference of Building Officials</td>
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<td>ICC</td>
<td>International Code Council</td>
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<tr>
<td>IECC</td>
<td>International Energy Conservation Code</td>
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<tr>
<td>LEED</td>
<td>Leadership in Energy and Environmental Design</td>
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<tr>
<td>LIHEAP</td>
<td>Low-income Home Energy Assistance Program</td>
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<tr>
<td>OCEAN</td>
<td>Online Code Environment and Advocacy Network</td>
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<tr>
<td>PCE</td>
<td>Power Cost Equalization Program</td>
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<tr>
<td>PNNL</td>
<td>Pacific Northwest National Laboratory</td>
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<tr>
<td>RCA</td>
<td>Regulatory Commission of Alaska</td>
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<td>SEP</td>
<td>State Energy Program</td>
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<td>USGBC</td>
<td>U.S. Green Building Council</td>
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<tr>
<td>VA</td>
<td>Veterans Affairs</td>
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<tr>
<td>WAP</td>
<td>Weatherization Assistance Program</td>
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EXECUTIVE SUMMARY

In February of 2009, Congress passed the Recovery Act, which provided states with unprecedented levels of stimulus funds. One intent of the Recovery Act was to provide funding to help states move to adopt updated energy codes; and implement a plan to achieve 90 percent compliance with the codes by the year 2017. Alaska received about $28 million in Recovery Act funding. See The Recovery Act section on page 9.

Alaska has statewide building codes, but as currently structured, they do not work effectively. Currently, no state entity is authorized to adopt a statewide energy code that applies to all buildings. Rather, the currently adopted statewide codes are managed by at least four different state departments, Alaska Housing Finance Corporation (AHFC), Department of Labor, Department of Public Safety, and Department of Education and Early Development.

This patchwork of different codes is burdensome and inefficient: there is limited permitting, inconsistent, minimal or no enforcement, and they are administered by multiple state or local departments. This results in:

- A patchwork of adopted codes has created confusion by builders and others about which code is required in which jurisdiction, and which codes are enforced by whom.¹
- An undue burden of inefficiencies for general contractors during the permitting process, as they have to go to two or three different agencies to get the appropriate sign-offs needed for construction.²
- In-eligibility of home buyers for AHFC financing if a local code isn’t as stringent as the BEES.

See the CODE ADMINISTRATION AND ENFORCEMENT section on page 33.

Alaska is a state with unique characteristics and a unique history. It has 16 percent of the United State’s landmass, and less than 0.3% of its population.¹ Many towns and cities are without a road network and are accessible only by boat or airplane, making the distribution of energy to homes and businesses costly. In the same way, code enforcement for remote communities is expensive and

¹ The DFLS defers authority to certain local jurisdictions to adopt building and construction regulations (fire, safety, and life codes must be at least as stringent as the DFLS requirements); issue building permits; establish and collect fees for permits; and conduct inspections. These local jurisdictions that have received “deferred jurisdiction” and administer the commercial fire and life safety codes locally are: Anchorage, Juneau, Fairbanks, Kenai, Ketchikan, Seward, Kodiak, Sitka, Soldotna, University of Alaska Fairbanks, Wasilla/Lakes. In these jurisdictions, the commercial code is enforced by a local building department, and with ICC certified plan reviewers and inspectors.

² Builders may have to complete paperwork for the Department of Public Safety, the Department of Labor and Workforce Development and the Alaska Housing Finance Corporation.
inefficient in the current system.iii In Alaska, many homes and businesses are heated with expensive fuel in an extreme climate and as a result many Alaskans pay high energy bills. See **ALASKA STATE OVERVIEW** section on page 13.

High energy bills are only a part of the cost burden to taxpayers, as state and federal governments invests millions in programs that help reduce energy bills for households and business; between 2008 and 2012, more than $643 million was spent to help reduce energy bills for families and businesses in Alaska. Alaskans are painfully aware of the impacts that high energy costs have on personal, local and statewide economies; **yet there is no statewide energy standard to ensure that buildings built now and in the future do not require as much of this expensive energy.**

See the **Cost and Potential Savings from Energy Codes** section on page 29.

The absence of energy standards means that there is no specified minimum level of insulation, air leakage, heating equipment efficiency, or windows and door efficiencies for new construction or major remodels. In many areas of the state, it is legal to build a structure with no insulation or other consideration for the energy use of the building. This will impact the monthly energy and maintenance bills for current and future building owners for the next 50 years or more. On a broader scale, it impacts all Alaskan taxpayers as the state invests in assistance programs to reduce these high energy bills.

Further, there is no **residential building** code adopted statewide. This leaves home buyers in most parts of Alaska (areas without a locally-adopted code) unprotected from basic fire and safety threats, and unprotected from high energy bills over the lifetime of the structure.

Alaska’s Cold Climate Housing Research Center developed an Alaska-specific cost-benefit analysis for a residential energy code. The additional cost for building a home to an updated 2012 version energy code (as compared to a 2009-version) range from $215 to $4,228 (depending on climate zone) and the lifecycle cost savings range from $2,622 to $26,252, with a payback ranging from 0.1 to 2 years (depending upon energy costs).

See the **ALASKA’S ENERGY CODE** section on page 27.

In the current structure at the local level, municipalities and boroughs can choose to adopt (and choose whether or not to enforce) whatever building codes they choose (other than the mandatory commercial statewide codes adopted by the DPS). Some municipalities have adopted codes; some have not. Some have adopted older codes (2006 version) and some (very few) have updated codes (2012 version).

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iii However, an exception is that buildings that are publicly funded or financed are required to comply with AHFC codes, and the AHFC enforcement system ensures that they are inspected.
Although some feel that one state energy code would not be feasible for Alaska due to its multiple distinct climates, several local building officials interviewed for this report seem receptive to the concept of regional energy codes, as currently delineated by the AHFC BEES. There are a few options that should be considered by the state:

1. The state could adopt a statewide commercial and residential building code that includes an energy code.

2. The state could adopt an energy code independent from a statewide building code. For example, in Louisiana and Illinois, a statewide energy code is now in place, although the state remains home rule for other building code aspects.

3. The state could create a Building Codes Commission responsible for adopting a building and energy code for the state.

See the Local energy code adoption section on page 36.

The legislature can assign one state department with the authority to adopt and administer all building codes, in order to assure consistency throughout the state in code related matters; and to provide local jurisdictions and state agencies with one go-to point for all energy code related matters. As the DFLS is the agency most commonly considered the de-facto building department, it could be assigned this role. However, since it has not previously dealt with energy code issues, a Codes Advisory Committee should be formed to advise the DFLS in energy code matters. The Cold Climate Housing Research Center published a report in June of 2012 entitled “Statewide Codes White Paper”, which describes how such a committee could be formed. See that report for additional information. See the

As there has historically been no over-arching energy code for the state, the system for enforcement and the specific issues related to administering such a code will need to be developed, such as enforcement costs, personnel, training, and more. Fortunately, the AHFC has a functioning and tested model for addressing these issues in Alaska. See Gaps and Recommendations #3, 9

The AHFC and Cold Climate Housing Research Center have a wealth of experience and knowledge that should be shared with consumers and other stakeholders. It will be much easier for state and local enforcement agencies to implement new policies with the support of consumers and others. See the CODE ADMINISTRATION AND ENFORCEMENT section on page 33.

It is much more cost-effective to build energy efficiency into a home during construction than trying to retrofit it after it’s been built. An Alaska energy code would address this problem by assuring that all new homes and buildings are built to a minimum standard of efficiency. The state of Alaska has options for improving buildings in the state, and should take actions to protect its citizens from a lifetime of high energy bills and sub-standard construction. See CONCLUSION section on page 64.
INTRODUCTION

Nationally, a large amount of energy is used to power and maintain buildings, accounting for nearly 49 percent of total energy consumption\(^2\) and 72 percent of electricity use.\(^3\) In Alaska, a large amount of energy is consumed by oil production on the North Slope and at the airport hub in Anchorage -- buildings account for approximately 27% of total energy, with industry accounting for 23%, transportation 26% and residential consumption accounting for the remaining 24%.\(^4\)

Building codes and standards protect home and building owners from sub-standard construction by requiring that buildings or homes be built to minimum construction standards. Within the building code, there are specific codes such as electrical, plumbing, and energy, each of which has their own specifications. There are some statewide building codes in place in Alaska, but they are a mix of different codes, limited permitting and enforcement, and multiple departments administering codes for residential or commercial buildings. Alaska has neither a state or regional residential building code or standard adopted, nor an energy code. This leaves home buyers in areas without an adopted code unprotected from basic fire and safety threats, and unprotected from high energy bills over the lifetime of the structure.

Alaska has expensive fuel prices and an extreme climate, which causes energy costs in Alaska to be very high. Alaskans are aware of the high costs of energy, and yet there is no statewide energy code. In many areas of the state today, it is legal to build a structure with no insulation or other considerations for the energy use of the building. The absence of a statewide energy code will impact the monthly energy and maintenance bills for building owners for the next 50 years or more.

An Alaska energy code would provide the following benefits to the people and state of Alaska:

- Reduce monthly energy bills for individual households, businesses, non-profits, municipalities, and state and federal government every month for the lifetime of the structures;
- Decrease peak energy demand, delaying the need to build new, costly gas supply systems and power plants;
- Increase the reliability of the state’s energy production and delivery systems, as lowered demand reduces stress on aging infrastructure.
- Reduce greenhouse gas emissions and air and water pollution, helping to mitigate EPA clean air violations in the state;

A common argument against energy codes is that upfront construction costs for increased energy efficiency are too high. However in Alaska, builders have shown support for a statewide code in the recent past.\(^5\)
It’s important that buyers and owners understand that there are two costs that should always be considered when building or purchasing a building:

- The upfront design and construction costs account for five to ten percent of the total occupant cost over the span of a building’s serviceable lifetime.\(^6\)
- The ongoing operational and maintenance costs over the life of the building account for 60 percent or more of the total costs incurred during the lifetime of the building.\(^7\)

When both of these costs are considered at the time of construction or purchase, buyers discover that buildings built to energy codes save them money. Commercial and residential construction built to meet the requirements of the 2012 International Energy Conservation Code (IECC) can be at least 15 percent more energy efficient than those constructed to meet the 2009 IECC.\(^8\)

Using the US Department of Energy’s (DOE) method to calculate the costs for investing in energy efficiency upgrades from 2009 to 2012 in Alaska, the Cold Climate Housing Research Center determined that the typical builder would spend between $215 and $2,228 to meet 2012 BEES. This equates to a payback of 0.1 to 2 years (depending upon energy costs), with a lifecycle savings of between $2,622 to $26,252 in Anchorage and Fairbanks respectively.\(^9\)

The American Recovery and Reinvestment Act of 2009 (Recovery Act) provided states and cities with unprecedented funding and incentives to adopt the model energy code, (then the 2009 IECC) as a cost-effective component of a comprehensive solution to our current economic and energy concerns. However, Alaska has not adopted a statewide energy code for commercial or residential buildings, even though the Legislature declared in HB 306 that it was Alaska policy to encourage an energy code. Therefore, in many municipalities across Alaska, there is no energy code and as a result, building and home owners are vulnerable to high energy costs.

The development and adoption of a state energy code is the first step for Alaska toward helping Alaska homeowners, businesses, municipalities, non-profits, and state and federal governments lower their current and future energy costs. The state is fortunate to have solid experience in this regard through the Alaska Housing Finance Corporation’s (AHFC)’s Building Energy Efficiency Standard (BEES) -- a ready-made and tested climate zone sensitive energy standard that could be readily adopted by the state. Following the state’s adoption of a state code, the state and municipalities will need to design and carry out effective and feasible implementation strategies. Again, the AHFC model for implementing and monitoring BEES will provide a model for consideration.

The purpose of this report is to document Alaska’s energy codes infrastructure, and identify existing gaps, and opportunities for improving energy codes in the state. The “Gaps” and “Recommendations” throughout this report provide initial actions that the state, local jurisdictions
and third party organizations can take to begin to move towards adoption and implementation of an Alaska energy code.

**NATIONAL PERSPECTIVE ON ENERGY CODES**

The IECC and ASHRAE Standard 90.1 are developed and published every three years by consensus-based non-governmental organizations: the International Code Council (ICC) and the American Society of Heating, Refrigeration, and Air-Conditioning Engineers (ASHRAE), respectively. While there is no federally-mandated minimum standard for energy efficiency in private residential or commercial buildings, both organizations release national model codes (currently ASHRAE 90.1-2010 and 2012 IECC) every three years that establish baselines for residential and commercial development. States that want to ensure that construction within their boundaries meets these national minimum standards will adopt the national model codes. The responsibility for adopting energy codes is generally left to state governments. From a nationwide perspective:

- **Commercial Energy Codes:** As of October 1, 2012, 33 states, three U.S. territories, and the District of Columbia have mandatory statewide commercial energy codes in effect that meet or exceed ASHRAE Standard 90.1-2007. One state, Maryland, has already implemented a commercial energy code that meets or exceeds ASHRAE Standard 90.1-2010 (See Figure 1).

- **Residential Energy Codes:** As of October 1, 2012, 28 states, three U.S. territories, and the District of Columbia have residential codes that meet or exceed the 2009 IECC (See Figure 1). To date, Maryland is the only state to have implemented the 2012 IECC.

Several states are expected to adopt codes based on the 2012 IECC in the coming months.
Figure 1: US Energy Code Status Maps

Commercial State Energy Code Status
AS OF OCTOBER 1, 2012

Residential State Energy Code Status
AS OF OCTOBER 1, 2012

Source: BCAP, www.energcodesocean.org
FEDERAL POLICY

Although energy code adoption occurs on the state and local levels, the federal government—through Congress and DOE—has played a significant role in advancing energy code development, determining the relative energy savings of national model energy codes and supporting state- and local-level adoption and implementation.

EPACT

The Energy Policy Act (EPAct) of 1992 requires DOE to determine whether the most current model energy codes would improve energy efficiency for new and renovated residential and commercial buildings. EPAct also mandates that DOE make a new determination within twelve months for every subsequent revision of these codes. Each state then has two years to certify that it has revised its own energy code to meet or exceed the requirements of the latest edition of the national models or decline to adopt a residential energy code by submitting a statement to the Secretary of Energy detailing its reasons for doing so.¹⁰

For commercial buildings, DOE issued a final determination in October 2011 that ASHRAE Standard 90.1-2010 would achieve greater energy efficiency in buildings subject to the standard than if they were built to ASHRAE Standard 90.1-2007, specifically national source energy savings of 18.2 percent and 18.5 percent above for site energy consumption.¹¹

For low-rise residential buildings, DOE issued a final determination in May 2012 that the 2012 IECC would achieve greater energy efficiency in buildings subject to the code than if they were built to the 2009 IECC. The determination details the various code changes and subsequent energy savings gains that move the code towards DOE’s stated goal of 30 percent energy savings beyond the baseline established in the 2006 IECC.¹²

ALASKA STATE OVERVIEW

Alaska’s 722,718 residents are spread across an enormous state.¹³ While Alaska has 16 percent of the Unites State’s landmass, it has less than 0.3% of its population.¹⁴ Alaska’s 2011 population has grown over the past decade, rising by 1.8 percent from 2010 to 2011, which is twice the pace of the national average during that period of time.¹⁵ Many towns and cities are without a road network and are accessible only by boat or airplane, making the distribution of energy to homes and
businesses costly. In the same way, code enforcement for remote communities is expensive and inefficient in the current system.\textsuperscript{iv}

**Figure 2: Size of Alaska compared to continental US**

Source: Alaska Dept of Natural Resources, Division of Forestry

The climate in Alaska has distinct regions – in the southeast it is wet and warmer with winter temperatures typically reaching a low of only around 26 degrees\textsuperscript{16}; the south-central is mild and coastal; in the north the climate is arctic; and the interior climate is extreme, with temperatures plunging to 70 or 80 below zero.\textsuperscript{17} While the International Code Council (ICC) assigns two climate zones to Alaska: Climate zone 7 and 8, the Alaska Housing Finance Corporation (AHFC) designates four climate zones ("CZ") in these regions: CZ 6 (Southeast), CZ 7 (Southcentral), CZ 8 (Interior and Western), CZ 9 (Arctic Slope) for the state, as shown in the table below, copied from the AHFC. These zones are incorporated in the Building Energy Efficiency Standards (BEES) developed by AHFC.

\textsuperscript{iv} However, an exception is that buildings that are publicly funded or financed are required to comply with AHFC codes, and the AHFC enforcement system ensures that they are inspected.
LAND OWNERSHIP AND GOVERNANCE

Alaska’s territory is owned and governed by multiple entities, which limits state control and governance over many areas. As shown in the map below, most of the land in Alaska is owned by the US federal government, including national parks, forests and wildlife refuges, military reservations and the North Slope National Petroleum Reserve (in total, about 237.8 million acres). About 24 percent of the land is owned by the state of Alaska (about 89.8 million acres). About 10.5 percent is privately owned by 12 native corporations (about 39.3 million acres). Less than 2 percent is privately owned (5.9 million acres).\(^1\)

This report focuses only on the state-owned area of Alaska.

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**Table A301.1(2) - Climate Zones for Alaska by HDD\(^a\)**

<table>
<thead>
<tr>
<th>IECC zones for Alaska</th>
<th>HDD(^a) Range (IECC)</th>
<th>Old BEES Climate Regions</th>
<th>HDD(^a) Range (Old BEES)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zone 6</td>
<td>7200 - 9000</td>
<td>Region 1 - Southeast</td>
<td>7000-10,700</td>
</tr>
<tr>
<td>Zone 7</td>
<td>9000 -12,600</td>
<td>Region 2 - Southcentral</td>
<td>8600-13,500</td>
</tr>
<tr>
<td>Zone 8</td>
<td>12,600 -16,800</td>
<td>Region 3&amp;4 - Interior &amp; Western</td>
<td>11,300-17,700</td>
</tr>
<tr>
<td>Zone 9</td>
<td>16,800 -21,000</td>
<td>Region 5 – Arctic Slope</td>
<td>16,900-20,300</td>
</tr>
</tbody>
</table>

Source: AHFC BEES
Unlike most states, Alaska is organized into two forms of local government – cities and organized boroughs. Boroughs are a rough equivalent to counties, and a city is also part of the borough in which it is located. Both are municipal corporations and political subdivisions of the state, governed by either a city council or a borough assembly. However, unlike county-equivalents in other states, the 18 boroughs do not cover all of the land area in Alaska. Areas not included in one of the 18 incorporated boroughs are referred collectively as the “unorganized borough,” which altogether encompasses over half of Alaska’s territory – an area larger than any US state, and inhabited by about 13% of the state’s population. The unorganized borough is governed by the state legislature which has oversight of services that would otherwise be provided by an organized borough (e.g. education, planning and zoning).\(^v\)

\(^v\) See Appendix B: Population Estimates for Boroughs and Census Areas.
Of the approximately 388 communities in the state, most remain unincorporated. There are 144 cities and 18 boroughs.\textsuperscript{vi} There is no statewide sales tax or personal income tax, but some local governments do impose a local sales or property tax.

There are three different classifications of city governments in Alaska: First class, second class, and home rule. There are four classifications for boroughs: unified home rule, non-unified home rule, first and second class. First and second class cities, and first and second class boroughs are all considered “general law,” meaning that the state law defines their powers, duties, and functions. Home rule status allows local governments all legislative powers not prohibited by law or charter. A community must have at least 400 permanent residents to be eligible for home rule or first class city status.\textsuperscript{20}

\textsuperscript{vi} The 18 boroughs are: Aleutians East Borough, Anchorage, Bristol Bay Borough, Denali Borough, Fairbanks North Star Borough, Haines Borough, Juneau, Kenai Peninsula Borough, Ketchikan Gateway Borough, Kodiak Island Borough, Lake and Peninsula Borough, Matanuska-Susitna (“Mat-Su”) Borough, North Slope Borough, Northwest Arctic Borough, Sitka, Skagway, Wrangell, Yakutat.
CONSTRUCTION OVERVIEW

Like the rest of the country, the rate of new construction has slowed in Alaska as a result of the housing bubble and subsequent real estate crisis, as shown in Figure 6 below.21
Two key housing markets – Anchorage and the adjacent Matanuska-Susitna (Mat-Su) Borough - have slowed down since 2005, having lost about 2,400 construction jobs, more than 600 of which were in residential construction. Although demand for new construction has decreased dramatically since 2005 and cost many jobs, Alaska’s housing market fallout was less severe than that of the national housing markets. This was due in large part to the construction boom in the Mat-Su area between 2000 and 2006 as well as the state’s more conservative lending practices over the years. Alaska has the second lowest delinquency rate in the country.

Mat-Su’s population grew nearly 30 percent between 2000 and 2006, compared to just 8 percent population growth in Anchorage and 7 percent in the state as a whole. Mat-Su’s population boom was due to the high housing demand and prices in Anchorage in early 2000, which led many Anchorage workers who couldn’t afford homes in the city to turn to the more affordable housing options in Mat-Su.

In addition to a relatively stable housing market, the state’s number of residential housing units constructed rose by 19 percent during the second half of 2011, according to the Alaska New
Housing Unit Survey, 402 units were built during the second half of 2010 and 479 units during the same period in 2011.\textsuperscript{26}

Commercial construction in Alaska slowed down with the housing market fallout in 2009 according to \textit{Alaska’s Construction Spending 2012 Forecast}—an annual report compiled and written by researchers at the University of Alaska’s Institute of Social and Economic Research (ISER)\textsuperscript{vii}.\textsuperscript{27} The report projects that commercial construction spending will be about the same in 2012 as it was in 2011, estimated at about $120 million.\textsuperscript{viii}

While Alaska’s overall housing market appears to be in better shape in contrast to the rest of the country, there are still some cities\textsuperscript{ix} that suffered from the national housing market crisis in recent years. This presents a unique opportunity for the advancement of energy codes in Alaska and a valuable opportunity for code officials, design and building sector professionals to become more familiar with energy codes.

\textbf{Gap #1:} There is no organized permitting process in Alaska. If a home is built in many communities, there is no tracking mechanism for the state knowing that it was built.

\textbf{Recommendation to appropriate state agency:} Following the adoption of a statewide building code, the state should assist local jurisdictions by establishing a statewide system for reporting new construction starts and remodels.

\section*{ALASKA’S ENERGY PORTFOLIO}

\section*{SOURCES}

Alaska’s residential sector relies most heavily on natural gas for energy: 46% of the state’s natural gas supply and 36% of the state’s consumed fuel oil is used for home heating.\textsuperscript{28} Most smaller community electricity consumers are not interconnected by a transmission and distribution power lines. Especially in rural areas, communities rely primarily on diesel electric generators for power.

The state has more than 150 remote, separate electrical grids that serve villages. Although most of the small communities are not interconnected, the majority of the population is connected to transmission grids via

\textsuperscript{vii} Alaska’s Construction Spending 2012 Forecast is an annual report for the Construction Industry Progress Fund (CIPF) and the Associated General Contractors (AGC) of Alaska prepared by Scott Goldsmith and Mary Killorin of the University of Alaska’s Institute of Social and Economic Research (ISER).

\textsuperscript{viii} This particular commercial construction figure excludes the value of government-funded construction, hospitals, and utilities, which are captured elsewhere in the report with more detail.

\textsuperscript{ix} According to Alaska Housing Market Indicators report - Fall 2011, Anchorage’s new housing units went down by 27 units in 2011 from the second half of 2010, and Juneau’s total building permits decreased by 45 percent in 2011; a drop from 44 to 24 permits.
the the “Railbelt” electrical grid, which follows the Alaska Railroad from Fairbanks, through Anchorage, and to the Kenai Peninsula.

PRODUCTION

Alaska is an energy-producing state, ranked fourth in the nation for crude oil production and twelfth in total energy production with 1,743 trillion Btu produced in 2010, or 2.3 percent of the total national share. The state produces 0.6 million barrels of crude oil daily, and is ranked second in the nation in oil production, following Texas.

Figure 7 - Alaska’s Energy Exports

CONSUMPTION

One factor in the high cost of energy is that Alaska lacks an extensive road system between cities, towns and villages that could be used to transport fuel to more remote areas. Its electricity delivery infrastructure differs from the lower 48 US states in that many, especially rural, customers are not connected to transmission and distribution grids for electricity. Instead, they rely primarily on electricity generated locally from diesel generators. Most electric power comes from fossil fuels: natural gas and diesel fuel. In addition, the state has more than 50 hydroelectric power plants provide electricity to consumers.

According to the Alaska Power Association, more than 90 percent of Alaskans receive electricity from either a cooperative or a municipal (publicly-owned) utility.
The state does not rely on nuclear power at all, but does generate some electricity from geothermal and wind energy sources.

### POLITICAL ENVIRONMENT

Alaska has a strong history of local government and there exists a firm belief among some within the state—particularly in rural areas—that local governments should be allowed to choose their own building code - and whether or not to adopt a building code at all.34

In interviews conducted for this report, varied opinions were shared regarding energy codes.

Some local governments and building department staff view an energy code as an unwelcome intervention into local politics. Many consider Alaska the “last frontier” and as such, federal or state mandates are unwelcome.35 This mindset may work fine for the original building owner (at least they know what codes the structure was built to), but as soon as that building is sold, it becomes a public and social issue, with real public costs associated in the forms of taxpayer-funded programs such as the weatherization or home energy rebate funding - used to improve the life safety and/or energy efficiency of the property.

Some feel that the current fragmented structure of having different codes in different jurisdictions, no codes in many areas, and the lack of one state agency administering these varying codes is inefficient and unnecessarily confusing. Since the rules regarding building and energy code requirements are different from one municipality to the next, there is an “uneven playing field” for builders across the state. As such, the Alaska State Home Builders Association has supported the adoption of a statewide building codes and energy efficiency standards for Alaska.

Some building Officials and building department staff believe that statewide building and energy codes are needed. They would support a statewide mandate that levels the playing field for all builders, and which would simplify and make consistent code enforcement efforts across jurisdiction lines.

Others feel that one statewide energy code would not be feasible for Alaska as it has several distinct climates. When asked whether a regional energy code, similar to BEES, based on Alaska-defined climate zones code would work, most local jurisdictions believed that it would.

In interviews for this report, several people mentioned that the current Governor is opposed to any new mandates or regulations. It is unclear to many people that Alaska has any statewide codes in place. Some people view the BEES as a statewide energy code, but it’s a standard that only applies to buildings funded or financed with state funds; it does not apply to all buildings.
Furthermore, the building codes are managed by multiple departments, and determining which department covers which code is problematic: there are gaps in some regions where enforcement is difficult; and some aspects of some codes are not adopted, others are (i.e., residential electrical and plumbing codes and smoke and carbon monoxide monitoring are adopted statewide by DOLWD and DPS, but not necessarily inspected, and depending on financing, other building and energy codes may be required.

While most local government staff interviewed for this report are aware of the high energy prices in Alaska, most were unaware of the expensive drain on state and federal dollars in the effort to reduce energy bills and improve the energy efficiency of houses and buildings after they’ve been built.

The conflict between the state’s lack of direction and varied local opinions forms the backdrop for building and energy code adoption and updates in Alaska.

**Gap #2:** Many people interviewed for this report do not see a connection between the high cost of energy in Alaska and the benefit energy codes would bring to Alaskan homeowners, businesses, municipalities, the state and federal governments.

**Recommendation to AHFC or appropriate state agency:** Stakeholders need information about the relationship between the high costs of energy in areas outside of Anchorage and Mat-Su and the benefits that energy codes would bring. This information should include: the amount of state and federal dollars currently funding efforts to reduce energy bills for Alaskans; the potential ongoing monetary savings that can be achieved with an energy code; the increased comfort of energy efficient homes and buildings; strengthening of Alaska’s economy by reducing energy bills for businesses, non-profit organizations, municipalities, state and federal governments; that a statewide energy code would level the playing field for builders; and that energy efficiency increases a family’s take-home pay by reducing monthly costs.

Further, the state is in need of widespread education of stakeholders in Alaska – local jurisdictions, the Alaska Municipal League (AML), and others should be targeted as a high priority for getting information out. Information could be delivered at conferences or meetings, such as the Department of Public Safety meeting held in Anchorage where local deferred jurisdictions meet to discuss code related matters each year.

**RECENT RELEVANT STATE LAWS**

In June 2010, Governor Sean Parnell signed into law two bills:
**Senate Bill 220:** The Alaska Sustainable Energy Act authorizing several state agencies or departments to initiate energy efficiency and renewable energy actions. For example, it: (1) authorizes the AHFC to issue $250 million in bonds to create a revolving loan program to help finance energy-efficiency retrofits in public buildings; (2) mandates that energy efficiency improvements be made on at least 25% of Alaska’s larger public buildings (10,000 square feet or more) by 2020; (3) authorizes AHFC to cooperate with Alaska Energy Authority (AEA) to provide technical assistance to municipalities related to residential and commercial building energy codes and energy efficiency standards.36

In addition, the law tasked the Office of Management and Budget to work with state agencies to develop a standardized methodology to collect and store energy consumption and expense data, and tasked the governor with providing a plan to the legislature by January of 2011 on how to streamline the state’s energy departments and programs to avoid duplicative efforts. These deliverables have been met.37

**House Bill 306** establishes a policy of the state to “(1) institute a comprehensive and coordinated approach to supporting energy efficiency and conservation by (A) encouraging statewide energy efficiency codes for new and renovated residential, commercial, and public buildings…” It also establishes a statewide goal (not a policy or statute) that 50% of electricity use in Alaska be derived from renewable energy sources, and to achieve a 15 percent increase in energy efficiency on a per capita basis between 2010 and 2020. No funding has been attached to this goal.

**GAP #3:** While the state has established a goal to achieve a 15 percent increase in energy efficiency on a per capita basis between 2010 and 2020, there appears to be no single agency responsible for overseeing this goal, no funding assigned to this task, and no coordinated formal action toward this goal was found during research for this report.

**Recommendation to Governor:** The state should assign a lead agency or department responsible for achieving this goal. In the short-term, it would be efficient to assign or at least link the responsibility for this task to the same agency responsible for collecting state energy bill data (assigned to the Department of Commerce, but currently being done by AHFC, which could be assigned to lead this task), or the state Department of Transportation and Public Facilities, as it is charged with improving the energy efficiency of state owned buildings (a related task).

**GAP #4:** Municipalities are likely not aware that they can receive technical assistance, and, other than Anchorage, have not requested assistance related to residential and commercial building codes and energy efficiency codes and standards.
Recommendation to AHFC and AEA: The state should offer formal assistance and education to municipalities to support their inquiries and needs as they consider adopting or updating an energy code. The state will need to make municipalities aware that such service is available. Perhaps the AML can assist with this task. As a side benefit, it may educate AML and bring them aboard as supporting partners in the effort.

CLIMATE PLANS

A growing number of states are developing climate change task forces to develop state climate action plans. A task force often brings together experts within the state to develop a comprehensive strategy to address climate change. Members typically include state and local policymakers, policy analysts, environmentalists and other stakeholders from the energy, industry, transportation, agriculture, forestry, and waste sectors.

In 2007 the State of Alaska created the Climate Change Sub-Cabinet by Administrative Order 238 signed by former Governor Sarah Palin in order to advise the Governor on the preparation and implementation of climate change strategies. The result was a final report that addressed the effects of climate change on Alaska, preparing policies, and providing guidance regarding Alaska’s participation in national and regional initiatives.

According to the state of Alaska’s website, the impacts of climate change are already occurring as the state experiences coastal erosion, increased storm effects, sea ice retreat and permafrost melt. More than 160 rural communities are threatened by erosion, and the villages of Shishmaref, Kivalina, and Newtok have already begun relocation plans.

According to the United States Global Change Research Program, Alaska is warming at more than twice the rate of the rest of the United States with annual average temperatures increasing 3.4°F, while winters warming by 6.3°F over the last 50 years. Rising temperatures are causing earlier spring snowmelt, reduced sea ice, widespread glacier retreat, and permafrost warming. Although increased precipitation is predicted and overall higher rate of evaporation will lead to drier conditions and reduced soil moisture. Average annual temperatures are projected to rise between 5 and 13°F by late this century.

GAP #5: The state does not have one agency or department to oversee climate change impact or a policy that could help support energy codes as a part of a larger statewide effort.

Recommendation for legislators / Governor: Adopt an Energy Plan to raise awareness statewide of the importance of energy efficiency and the benefits it can bring to Alaska. Energy codes should be incorporated into a the plan as a way to assure that all new buildings and homes use less fossil fuel derived energy.
Some of the key stakeholders invested in energy codes and building performance in Alaska include:

The Alaska Department of Public Safety (DPS) Division of Fire and Life Safety (DFLS) is generally considered the State Building Official. The DFLS has statewide jurisdiction for fire code enforcement and plan review for commercial buildings except in the 11 jurisdictions that have been granted “deferred” status, and administer the state fire, life and safety codes for commercial buildings. Construction, repair, remodel, addition, or change of occupancy of any building/structure, or installation or change of fuel tanks must be approved by the DFLS prior to the commencement of work. Residential housing under four units is exempt.

The Department of Labor and Workforce Development (DOLWD) Labor Standards and Safety Division administers the Mechanical Inspections program which has oversight of a variety of mechanical work (new construction electrical and plumbing installations, boiler and pressure vessels and more) to ensure public safety. The Mechanical Inspection Section issues licenses to qualified workers in electrical, plumbing, and boiler fields, and enforces the Contractor Licensing and the Mechanical and Electrical Administrator programs.

Alaska Housing Finance Corporation (AHFC) AHFC’s mission is to provide Alaskans with access to safe, quality, affordable housing. It offers several weatherization and rebate programs to promote energy efficiency in Alaska, administers the state Building Energy Efficiency Standard (BEES) code, and is the state’s leading energy efficiency agency. AHFC’s profitable financial services provide funds to the state’s general fund.

The Department of Education and Early Development (DEED): DEED is tasked with setting standards for energy efficiency for school construction and major maintenance to provide energy efficiency benefits for all school locations in the state. Those standards have not yet been set, but the DEED is currently considering following AHFC’s lead and adopting the BEES for educational facilities.

Alaska Department of Transportation and Public Facilities (DOT/PF) is charged with improving the energy efficiency of state owned and operated public buildings. It contracts with Energy Service Companies (ESCOs) to implement energy efficiency measures in state buildings.

Alaska Energy Authority (AEA): AEA’s mission is to reduce the cost of energy in Alaska. The Authority is a public corporation of the state with a separate and independent legal existence. In addition to other initiatives, AEA provides support for alternative and renewable energy projects, especially in rural areas; administers loans to local governments and utilities; and administers the PCE program.

Cold Climate Housing Research Center (CCHRC) is an industry-based, nonprofit corporation in Fairbanks that promotes and advances the development of healthy, durable, and sustainable shelter for Alaskans and other circumpolar people. It was conceived and developed by members of the
Alaska State Home Builders Association (ASHBA) and represents more than 1,200 building industry firms and groups. It is a highly-regarded intellectual resource for the building industry in Alaska.

**Alaska State Homebuilding Association (ASHBA)** is a statewide organization run by and for its members in Alaska. It supports the common interests of building contractors and others engaged in a trade, industry or profession as it related to housing, particularly those related to labor, production and finance. It strives to maintain high standards in the building industry, to support building contractors in efforts to rectify conditions of an unsatisfactory nature, to encourage those methods of contracting work which reduce the building contractor’s risks and to encourage sound business methods.

**Alaska General Contractors Association (AGC)** is a non-profit construction trade association. Its members include general contractors, subcontractors and industry professionals in these categories: Building Division; Heavy-Industrial Division; Highway-Utility Division; Specialty Division; and Associate members, which perform the majority of the commercial and industrial, public and private work in Alaska.

### ALASKA’S ENERGY CODE

In the United States, building codes are adopted on the state and/or local levels. 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, although a handful of states are considered “home rule” in regard to building codes, which means most codes are adopted at the local level.

In Alaska, the state legislature must grant code-adoption authority to a state department in order for the department to be able to adopt codes. The legislature has granted authority to adopt fire, life and safety codes to the Alaska Department of Public Safety (DPS), and its DFLS has deferred its authority to some local jurisdictions for oversight of commercial fire, safety and life codes. However, the legislature has not granted any department the authority to adopt the energy code, and **there is no statewide energy efficiency code for either residential or commercial buildings in Alaska.**

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* The DFLS defers authority to certain local jurisdictions to adopt building and construction regulations (fire, safety, and life codes must be as least as stringent as the DFLS requirements); issue building permits; establish and collect fees for permits; and conduct inspections. These local Jurisdictions that have received “deferred jurisdiction” and administer the commercial fire and life safety codes locally are: Anchorage, Juneau, Fairbanks, Kenai, Ketchikan, Seward, Kodiak, Sitka, Soldtana, University of Alaska Fairbanks, Wasilla/Lakes. In these jurisdictions, the commercial code is enforced by a local building department, and with ICC certified plan reviewers and inspectors.
However, in order for buyers of residential homes or commercial buildings to receive state financing through AHFC, the homes and buildings must comply with the International Building Code (IBC) and the state-developed BEES.

The 2009 BEES is based on the 2009 IECC for commercial and residential structures. It differs from the IECC in that it: (1) has Alaska-specific (strengthening) amendments; (2) includes ASHRAE 62.2-2010 *Ventilation and Acceptable Indoor Air Quality in Low-Rise Residential Buildings*; and (3) designates four climate zones in the state of Alaska, while the IECC designates only two. The AHFC is currently considering updating the BEES to a code based on the 2012 IECC.

The BEES is required for all residential and commercial buildings funded wholly or in part by AHFC programs or other state funds. It applies to new construction or additions only (not major remodeling projects without an addition).

In the case of resale – where a buyer wants to use state-financing to purchase an existing home or building, the structure must have been built to BEES standard and applicable structural, electrical, and plumbing codes, if it was constructed after 1991.

AHFC reports that less than half the mortgages made in recent years have used AHFC financing as lower interest rates from federally subsidized (Fannie and Freddy) lending institutions have entered the market.

**HISTORY**

The first BEES energy code enacted in Alaska went into effect on January 1, 1992 following several years of negotiation and collaboration between the state and Alaska homebuilders. As part of that negotiation, the state agreed to use the Home Energy Rating Method as a way to demonstrate compliance with the BEES, which equates to a 4-star plus energy star energy rating on the Alaska system. Since the original adoption, the code was updated periodically and in November 2006 it was updated to the 2006 IECC with Alaska-specific amendments and included ASHRAE Standard 62.2-2004, *Ventilation and Acceptable Indoor Air Quality in Low-Rise Residential Buildings*. The BEES was updated again in February 2010.

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**xi** AHFC is a quasi-governmental organization that functions largely like a private entity and has its own board of directors. However it has authority to issue bonds, and XXX

**xii** Proof of the BEES standard is shown through AHFC forms PUR-101 and PUR-102; AHFC keeps records on which homes and buildings have complied with the BEES.

**xiii** The Home Energy Rating Method is a unique rating system for Alaska-only. It is very similar to the Home Energy Rating System (HERS) rating used by other US states to measure the performance of a home or to show compliance with ENERGY STAR.
BEES was well ahead of the model energy code when first enacted, and remained static till the model energy codes caught up. With the adoption of the 2012 IECC and amendments, the BEES will move forward again in efficiency improvements.

There have been several attempts to adopt a statewide building and/or energy code in Alaska, but none have succeeded.

In 2004, a “Safety Code Task Force” created by the Legislature to research and make recommendations on building codes and the administration of codes in Alaska recommended that (among other things) the Legislature establish and Building and Life Safety Code Commission tasked with adopting building and life safety codes, and consider the adoption of statewide residential building and life safety codes.41

In 2005, in anticipation of the possibility of a forthcoming statewide residential building code, the ASHBA formed a committee to take proactive steps toward adopting a voluntary state building code. After working for two years on a voluntary code based on the 2003 IRC, the committee concluded that a voluntary code was not feasible and a statewide residential code would have to be administered by the State.42

In 2008 and 2012 the Cold Climate Housing Research Center (CCHRC) convened local experts to work together to develop recommendations for policies to improve energy efficiency in Alaska. A top recommendation of the experts was that the state should adopt a statewide building code that included an energy efficiency standard.

There have been several attempts to adopt a statewide building code and energy efficiency standard in Alaska, but none have succeeded. Some state and local officials understand the importance of energy building codes and energy efficiency standards, but seem to be have lost optimism and excitement for seeing it through. As one state official said “There have been about six attempts in the last 20 years to consolidate or make some change to the current structure. There have been committees, task forces set up by the legislature, and they’ve resulted in nothing. So at this point I have no opinion.”

**COST AND POTENTIAL SAVINGS FROM ENERGY CODES**

Many states and local governments do not have reliable data on the energy savings and incremental construction costs that are associated with updating their energy code. Identifying and putting a price tag on specific energy code upgrades, and comparing them against the anticipated energy
savings will begin to address concerns about the costs that home builders and ultimately home buyers—will bear if a new code is adopted.

CCHRC has developed regional cost estimates of the cost for builders to build to proposed BEES 2012 compared to BEES 2009. As shown in the table below, typically the additional costs range from $215 to $4,228 and the lifecycle cost savings\(^{xiv}\) range from $2,622 to $26,252, with a payback ranging from 0.1 to 2 years (depending upon energy costs).\(^{43}\)

**Figure 8: Estimated Incremental Cost, Energy Savings and Payback Data for 2012 BEES**

<table>
<thead>
<tr>
<th>Zone 6</th>
<th>Zone 7</th>
<th>Zone 8</th>
<th>Zone 9</th>
</tr>
</thead>
<tbody>
<tr>
<td>Estimated Savings / house ($ / year):</td>
<td>$1,249</td>
<td>$403</td>
<td>$1,845</td>
</tr>
<tr>
<td>Total Additional Costs:</td>
<td>$4,228</td>
<td>$3,634</td>
<td>$3,634</td>
</tr>
<tr>
<td>Simple payback period (years):</td>
<td>3.4</td>
<td>9.0</td>
<td>2.0</td>
</tr>
<tr>
<td>Net annual cash flow savings (year one)</td>
<td>$1,004</td>
<td>$192</td>
<td>$1,634</td>
</tr>
<tr>
<td>Years to positive savings:</td>
<td>0.5</td>
<td>2</td>
<td>0.2</td>
</tr>
<tr>
<td>Life Cycle Cost Savings:</td>
<td>$15,161</td>
<td>$2,622</td>
<td>$25,007</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Consumers’ Cash Flow (Average)</th>
<th>2012 BEES</th>
</tr>
</thead>
<tbody>
<tr>
<td>A Additional down payment and other up-front costs</td>
<td>$452</td>
</tr>
<tr>
<td>B Annual energy savings (year one)</td>
<td>$1,249</td>
</tr>
<tr>
<td>C Annual mortgage increase</td>
<td>$245</td>
</tr>
<tr>
<td>D = [B-C] Net annual cash flow savings (year one)</td>
<td>$1,004</td>
</tr>
<tr>
<td>E = [A/D] Years to positive savings, including up-front cost impacts</td>
<td>0.5</td>
</tr>
</tbody>
</table>

Source: Cold Climate Housing Research Center, 2012

As mentioned, Alaskans have high energy costs. But as the population of Alaska is widely dispersed and energy prices differ from one area to the next, this is reflected in the range of paybacks noted above. Many residents in the northernmost parts of Alaska with the most extreme temperatures and the greatest need for heating pay the highest prices for energy. For example, in the most

\(^{xiv}\) Assuming a standard 30 year mortgage with a 5% interest rate, the **life-cycle cost savings** are derived from using the difference between the savings gained from the reduced energy costs and the increased cost of the mortgage due to the energy efficiency measures. These costs and benefits are then converted to the net present value and summed over the lifetime of the loan, which for this calculation is assumed to be the same as the average useful lifespan of the energy efficiency measures.
expensive areas of the state, residents pay $10-11 per gallon for heating oil.\textsuperscript{44} While in Anchorage energy prices have been reasonably low for many years, as the city has become accustomed to locally harvested natural gas, prices are projected to rise, perhaps significantly in the coming years, and imports of natural gas are likely by 2014.\textsuperscript{45}

But the cost burden isn’t only on households—it is a burden on the municipal, business, non-profit, state and federal budgets as well. Alaskans spend a larger portion of their take-home pay on energy. Many cannot afford to pay their energy bills, and state and federal tax dollars are spent to keep the heat and lights on in these households. State and federal dollars fund consumer and public facilities to: (1) reduce energy bills for those who cannot afford the energy they use; and (2) retrofit existing homes to improve their energy efficiency after they’ve been built. The table below includes some examples of the state and federal spending due to high energy bills in Alaska. It is not a comprehensive account of the expenses related to reducing energy bills for Alaskans—there are additional programs and efforts to reduce bills not included in the table, such as a program run by Citgo Oil company which donates 100 gallons of fuel oil to every qualified household in various regions and utility-run programs that raise money from customers that can pay a little more to reduce costs for those who can’t.

Monthly energy bills are only a part of the actual cost to citizens, as tax dollars fund necessary assistance programs to reduce energy bills. Between 2008 and 2012, about $643 million was spent, as shown in the table below.

\textbf{State and Federal Expenses for Reducing Energy Costs in Alaska}

\begin{center}
\begin{tabular}{l|l}
\hline
\textbf{\$295.5 million (state)} & Between 2008 and 2012, Alaska has spent more than \$295 million to improve the energy efficiency of low-income homes through the state \textbf{Weatherization Assistance Program}.\textsuperscript{46} \\
\hline
\textbf{\$217.5 million (state)} & Between 2008 and 2012, \$217.5 million was spent to improve the energy efficiency of existing homes participating in the \textbf{Home Energy Rebate Program}. This program is available for all Alaska homeowners, and provides rebates of up to \$10,000 for improvements to existing homes. The \textbf{New Home Rebate Program} reimburses homebuyers \$7,500 for the purchase of highly energy efficient homes that score at least five stars on the Alaska Home Energy Rating scale.\textsuperscript{xv} AHFC financing is not required. As of October 30, 2012, the state has provided 1,654 rebates to homebuyers.\textsuperscript{47} \\
\hline
\end{tabular}
\end{center}

\textsuperscript{xv} See the AHFC web page for more information \url{http://www.ahfc.us/energy/new_home_rebate.cfm}
The **Power Cost Equalization Program** (PCE) funds utilities to reduce electrical cost for customers in rural areas of the state where electricity costs are very high due to transportation costs, high diesel prices, and local generation. In Fiscal Year 2011, the PCE program spent $31.8 million to reduce electrical costs for 77,341 customers living in 183 communities.48

In 2012, more than $18 million in federal funds and $8.5 million in state funds were distributed to reduce energy bills for lower income customers. The **Alaska Affordable Heating Program** uses federal **Low Income Home Energy Assistance Program** (LIHEAP) funding and allocations from the Alaska general fund to pay a portion of the energy bills for households that earn up to 225 percent of the federal poverty level.49

The Recovery Act provided $28.2 million for statewide energy efficiency in schools, commercial buildings, industrial users and large local facilities, and to help communities develop pilot projects to reduce energy use. It also established educational energy auditing programs for commercial and small businesses, and non-profits, and improved the energy efficiency of school buildings and state facilities.50

The Recovery Act provided $18.1 million for **Weatherization Assistance Program** to improve the energy efficiency of low-income housing.51

The Recovery Act provided $25.3 million **Energy Efficiency and Conservation Block Grants** to develop, promote, and implement energy efficiency and renewable energy programs in 152 local communities across the state.52

In addition, the state spends an estimated $641 million in annual energy costs for Alaska state public buildings.53

Yet local government officials and other stakeholders interviewed for this report were largely unaware of the state funded programs, and how they relate to the lack of energy codes. There is a widespread disconnect in the minds of the most important stakeholders – local government officials – making the connection between making structures more energy efficient during construction or renovation and reducing energy bills and the need for state-funded programs for Alaskans in the long-term. As long as Alaska fails to adopt energy efficiency standards for new structures in the
state, inefficient structures will continue to be built, and building owners will continue to need state and federal funds to pay bills and retrofit their inefficient buildings.

It is much more cost-effective to build energy efficiency into a home or commercial structure during construction than trying to retrofit it after it’s been built, and an energy code would address this problem.

In interviews conducted for this report, state and local government officials and other stakeholders often expressed that energy codes have a low value because they increase construction costs too much.\textsuperscript{xvi} It’s important that these individuals understand the two costs that should always be considered when purchasing a building::

- The upfront design and construction costs account for just five to ten percent of the total occupant spending over the span of a building’s serviceable lifetime.\textsuperscript{54}
- The ongoing operational and maintenance costs account for 60 to 85 percent\textsuperscript{55} of the total lifecycle costs\textsuperscript{xvii}

When both of these costs are considered at the time of purchase, energy codes prove to save owners money. The cost for making energy efficiency improvements for new homes are significantly less than the cost of retrofitting existing ones after they’ve been built. In fact, Alaska’s Home Energy Rebate Program and the Weatherization Assistance Programs show simple paybacks for retrofits in just over eight years.\textsuperscript{xviii}

\textbf{Gap #6:} There is a widespread disconnect in the minds of the most important stakeholders – local government officials – making the connection between making homes more energy efficient during construction or renovation and reducing energy bills and the need for state funded programs for Alaskans in the long-term. As long as Alaska fails to adopt energy efficiency standards for new structures in the state, inefficient structures will continue to be built, and building owners will continue to need state and federal funds to pay bills and retrofit their inefficient buildings.

\textbf{Recommendation to state agencies:} Educate local government officials on the importance of energy codes. Conduct targeted outreach to local officials and other related stakeholders such as the AML, the home builder associations, and others to increase support for energy codes.

\textbf{CODE ADMINISTRATION AND ENFORCEMENT}

\textsuperscript{xvi} As previously noted, CCHRC has developed a state-specific cost-benefit analysis of adopting residential BEES 2012 energy code, which they are sharing with stakeholders in Alaska

\textsuperscript{xvii} Land acquisition, conceptual planning, renewal or revitalization, and disposal accounts for the remaining 5-35 percent.

\textsuperscript{xviii} Both of these programs improve the energy efficiency of homes after they've been built.
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, the state and its municipalities must carry out energy code implementation, a term used to describe all of the activities carried out by the state, local and regional building departments, the building industry, and other stakeholders that lead to compliance with the energy code. Code administration includes such items as: 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.

ADOPTION PROCESS

There is no singular codes development entity in Alaska. In order for a statewide residential building code or energy efficiency code to be adopted, it would either need to be passed by the state legislature, or the legislature would need to grant authority to a state entity to adopt such a code.

Residential and Commercial codes are adopted and implemented at the local level in Alaska. While there is no standard adoption process, it is common for a city or borough building official to work with local stakeholders to develop (or update) a code ordinance and present it to the jurisdiction’s legislative body for approval. This causes confusion, as DPS does not have the authority to adopt residential codes, AHFC has adopted the IRC, and DOLWD adopts the NEC and Uniform plumbing code. These communities often look to the state for direction on what it has adopted. Some communities believe they cannot adopt a code that the state has not adopted.\textsuperscript{xix}

DIVISION OF RESPONSIBILITIES

There is no state-level building department, nor a single department responsible for building codes or energy efficiency standards. Only two state entities have the authority to adopt codes: the Alaska Housing Finance Corporation (AHFC), the Department of Education and Early Development (DEED).

The state legislature has granted limited powers to these state regulatory entities to adopt codes, as detailed below.

\textbf{Authority to Adopt Building Codes and Energy Efficiency Standards}

\textsuperscript{xix} While communities may develop and adopt whatever \textit{residential} code they see fit for their community, they may not adopt a commercial code less stringent than what the state DFLS has adopted.
1. **Alaska Housing Finance Corporation**: AHFC adopts and enforces both building codes and the BEES for any residential or commercial building that receives state financing or funding. Proposed changes to the standards for residential buildings can be submitted to the AHFC, which reviews and acts on the proposals. Public hearings are required before changes are adopted.

2. **The Department of Education and Early Development (DEED)**: DEED is tasked with setting standards for energy efficiency for school construction and major maintenance to provide energy efficiency benefits for all school locations in the state. Those standards have not yet been set, but the DEED is currently considering following AHFC’s lead and adopting the BEES for educational facilities.

### Authority to Adopt Other (Non-Energy) Codes

3. **The Department of Public Safety (DPS), via the Division of Fire and Life Safety (DFLS)**: The legislature has granted authority to the DPS to adopt (and regularly update), enforce, and administer these four codes for commercial buildings four units or more: Building, Mechanical, Fuel Gas, and Fire. DPS believes that it does not have the authority to adopt an energy code because the statute granting DPS authority to adopt these codes specifies that the codes are to be adopted specifically for fire, life, and safety. DPS can update fire, life, and safety codes as needed by administrative rulemaking without further legislative approval. The updated code must be signed into law by the lieutenant Governor.

There is no similar building code for residential dwellings under four units.

4. **The Department of Labor and Workforce Development** adopts and enforces the Uniform Plumbing, National Electrical Code, Boiler Code, Construction Code and a family of elevator codes (and others such as amusement rides, tramways). The DOLWD administers these codes and has the authority to update them. It does not issue permits, but must be “noticed” for new boiler and elevator installations.

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**xx** The building codes AHFC has adopted are the International Residential Code (IRC) for residential structures and the International Building Code (IBC) for commercial structures.

**xxi** The process for adopting a new code is as follows: the DFLS works with industries and cities to draft a code; following a public comment period, the DFLS makes any changes it deems appropriate; then the code is submitted to the Alaska Department of Law; finally, it is submitted to the Lieutenant Governor for signature, whereby it becomes law.
This causes confusion, as AHFC has adopted the BEES and the International Residential Code (IRC), DPS claims not to have the authority to adopt residential codes or energy codes, and DOLWD adopts an electric code (but not for all structures) and a plumbing codes for all structures.

**Gap #7:** Building codes and energy efficiency codes can be complex and confusing, and the absence of a single state department for code matters leaves local jurisdictions without a “go-to” source for information and support.

**Recommendation to Governor/Legislature:** Assign one state department the responsibility for all building and energy codes, to assure consistency throughout the state in code related matters; and to provide local jurisdictions and state agencies with one go-to point for all code related matters. As the DFLS is the agency most commonly considered the de-facto building department, it could be assigned this role. However, since it has not previously dealt with energy code issues, a Codes Advisory Committee should be formed to advise the DFLS in energy code matters. The Cold Climate Housing Research Center published a report in June of 2012 entitled “Statewide Codes White Paper”, which describes how such a committee could be formed. See that report for additional information.

**Gap #8:** No state-level entity is authorized by the Legislature to adopt energy codes.

**Recommendation to Stakeholders:** Form a coalition of stakeholders to raise this issue with legislators and the Governor. Elected state officials, local governments, and other decision-makers need to be educated on the importance of building and energy codes to Alaska, and that one state-level agency or department needs to be assigned to a leadership role for codes. Obviously, this will take a great deal of collaboration, meeting, and education of influential individuals in order to develop the collective strength and political will of a critical mass of stakeholders to influence the legislature. The CCHRC and AHFC should continue to convene stakeholders to educate them and build a coalition that can influence decision-makers on the benefits of energy codes; the importance of streamlining state oversight of building codes.

**LOCAL ENERGY CODE ADOPTION**

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; in other states, local jurisdictions must meet a statewide minimum first. 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.
In Alaska, municipalities are free to determine which residential building or energy code to adopt (or not), and whether or not to enforce that code. About 17 municipalities have adopted a form of a building code for residential and/or commercial buildings, and some have also adopted energy codes. Some communities follow the state’s lead in adopting codes, and are not inclined to adopt more stringent codes on their own.\textsuperscript{56}

Energy code adoption varies greatly between jurisdictions. For example:

- Anchorage (2011 population: 295,570) – the largest city in Alaska, is considered a leader in code adoption and enforcement by its peers in smaller jurisdictions. Once a year, DPS-deferred jurisdictions gather to discuss code related matters and Anchorage officials often offer advice to those not as far along in the process. Yet Anchorage’s energy code is behind modern energy codes as it has only adopted the 2006 IECC with significant weakening amendments. Visual inspections are conducted for the vapor barrier and insulation only – no other energy code items are inspected.
- The second largest city – Fairbanks (2011 pop. 32,036), has adopted the 2009 IECC. The stringency of enforcement is uncertain.
- Juneau (2011 city and borough pop. 32,164)- the third largest city in the state - has adopted the 2006 ICC codes for both residential and commercial construction, and is expected to soon update to the 2009 versions of the ICC. However, the energy provisions in the residential code were amended to include “Juneau specific amendments” and all energy requirements were removed from the commercial code. According to Juneau’s Building Official, it is legal for a new commercial building to be constructed without insulation and with only single pane windows as long as there are no residential units included in the building. In relation to energy aspects of new buildings, inspections include only insulation and a vapor barrier.
- In Ketchikan (2011 pop 8,110\textsuperscript{57} in city / with borough: 14,500\textsuperscript{58}), the city adopted the 2009 codes but not the energy code provisions in the code. Rather it replaced those with insulation and ventilation requirements. The borough has no building or energy code. According to the building official of Ketchikan, most banks require building inspections and energy codes prior to financing a home. They can just provide a Certificate of Occupancy (CoO) to banks and they’ll accept that as proof of energy code compliance since the CoO includes information on ventilation and insulation.
- The city of Cordova (2011 pop. ) is economically “booming” according to one city official, and is now considering updating its 1984 version of a building code to the 2006 version, including the energy code. No visual inspections are currently conducted for residential construction.
- In Kenai,(2011 city pop. 7,218)\textsuperscript{59} a Building Official reported that the city has adopted the IBC and IRC building codes but not the energy code portions of those codes, and that of the...
insulation that he’s seen, most builders are doing a very good job insulating. He says that people are aware of the advantages of insulation and those who can afford to insulate do a good job, adding, “Those who can’t, they do what they can, and that’s all we can expect.”

The result is a patchwork of energy codes and energy code implementation across urban and rural areas. As an example, below is an excerpt from the Statewide Codes White Paper by Dr. John Davies and Dr. Kathryn Dodge of the Cold Climate Housing Research Center:

_Eagle River while part of the Municipality of Anchorage (MOA) is not subject to the MOA building codes; the City of Fairbanks has building codes but the Fairbanks North Star Borough (FNSB) outside of the City does not; and portions of the Mat-Su Borough have codes while other parts of the Borough do not._

Gap #9: There is no statewide energy code requirement for either residential or commercial buildings in Alaska. Some feel that the current fragmented structure of having different codes in different jurisdictions, no codes in many areas, and the lack of one state agency administering codes is inefficient and unnecessarily confusing. Individual jurisdictions adopt whatever codes they want, or no codes at all. The absence of a singular statewide building and energy code for commercial and residential codes in Alaska result in:

- A patchwork of adopted Commercial codes which has created a complicated system for Commercial code enforcement in Alaska.
- An undue burden of inefficiencies for general contractors during the permitting process, as a general contractor has to go to two or three different agencies to get the appropriate sign-offs needed for construction.\(^{xxi}\)
- Confusion by designers, builders and others about which code is required in which jurisdiction and for which type of ownership of buildings.\(^{xxii}\)
- In-eligibility of home buyers for AHFC financing if the local code isn’t as stringent as the AHFC BEES.
- Alaskans living in potentially unsafe, unhealthy, and unnecessarily inefficient homes.
- Alaska businesses, non-profit agencies, municipalities, and the state and federal government operating in unnecessarily inefficient buildings.

**Recommendation for Governor’s office:** Local governments need leadership from the state on this issue. While the Governor has not taken a stance on energy codes, the Alaska Sustainability Act authorizes AHFC to cooperate with AEA to provide technical assistance to municipalities related to residential and commercial building codes and energy efficiency  

\(^{xxi}\) Builders may have to complete paperwork for the Department of Public Safety, the Department of Labor and Workforce Development and the Alaska Housing Finance Corporation.

\(^{xxii}\) There are different codes for privately-owned and financed buildings versus state-owned buildings, versus those that get AHFC funding.
Although some feel that one state energy code would not be feasible for Alaska due to its multiple distinct climates, several local building officials interviewed for this report seem receptive to the concept of regional energy codes, as presently found in BEES. As there has historically been no over-arching energy code for the state, the system for enforcement and the specific issues related to administering such a code will need to be developed, such as enforcement costs, personnel, training, and more. There are a few options that should be considered by the state:

1. The state could adopt a statewide commercial and residential building code that includes an energy code.

2. The state could adopt an energy code independent from a statewide building code. For example, in Louisiana and Illinois, a statewide energy code is now in place, although the state remains home rule for other building code aspects.

3. The state could create a Building Codes Commission responsible for adopting a building and energy code for the state.

CCHRC and AHFC have begun to hold meetings to discuss such issues with stakeholders. CCRHC and AHFC should continue and expand their efforts and form a coalition. A coalition of widespread supporters may demonstrate to the Governor and other influential decision-makers that the DFLS or another state entity should be allowed to take on more of a supporting role in developing regional codes for the state.

**Recommendations for Legislature:**

The Legislature should assign one state agency as the authority on building codes, including an energy code. The Department of Public Safety seems the most readily available and qualified agency for this role.

AHFC and CCHRC have convened coalitions and begun to educate stakeholders on the importance of energy codes. They should continue to convene stakeholders and take slow steps toward educating and engaging necessary stakeholders in order to change the structure of building code administration in the state. They need additional support from influential decision-makers stakeholders in other state departments and organizational stakeholders such as the municipal league.

**Gap #10:** Energy codes can be complex and confusing, and the absence of a single state department for energy code matters leaves local jurisdictions without a “go-to” source for information and support.
**Recommendation to Governor:** Assign one state department with the responsibility for all building codes, in order to assure consistency throughout the state in code related matters; and to provide local jurisdictions and state agencies with one go-to point for all energy code related matters. As the DFLS is the agency most commonly considered the de-facto building department, it could be assigned this role. However, since it has not previously dealt with energy code issues, a Codes Advisory Committee should be formed to advise the DFLS in energy code matters. The CCHRC published a report in June of 2012 entitled “Statewide Codes White Paper”, which describes how such a committee could be formed. See that report for additional information.

An alternative solution would be to assign a lead agency to provide guidance and technical support to local jurisdictions that have questions regarding energy code adoption and implementation. AHFC may be best qualified for this role, but funding would needed to expand its services to assist jurisdictions.

The Sustainable Energy Act also gives the Alaska Energy Authority the power to “promote energy conservation, energy efficiency, and alternative energy through training and public education.” As such, AEA could assist in getting the word out to all state agencies that this new service is available.

**STATE OWNED BUILDINGS**

Many states demonstrate their commitment to energy codes by setting the example, and Alaska has done so – sort of. Requiring more stringent energy codes for state-funded buildings demonstrates fiscal responsibility with tax dollars; familiarizes and trains the construction industry and code enforcement officials; and increases demand for “greener” products from product suppliers, manufacturers and service providers. In addition, more efficient public buildings help governments hedge against uncertain future energy costs and availability and reduce a government’s susceptibility to fuel price volatility – all while creating jobs and stimulating the local economy.

The state is leading by example by requiring new or retrofitted public facilities to be constructed to the most recently published edition of the ASHRAE.IESNA Standard 90.1, (Energy Standard for Buildings Except for Low-Rise Residential Buildings), as directed in the Sustainable Energy Act (SB 220) which was signed into law by Governor Parnell in June of 2010. However, there is not a go-to source of expertise that a government agency wanting to build a new facility can access. Rather, a state entity in need of a new facility must petition the state legislature for funding for the facility, but there is no further support to the agency to ensure that the new building is built to energy efficiency standards.

There is no inventory of the total number of municipally-owned buildings in the state. In addition, the amount of energy consumed in public facilities in Alaska is largely unknown, with the exception
of the Department of Education and Early Development (DEED) and the University of Alaska system which track energy use in their facilities.\textsuperscript{62}

In an effort to better understand energy use in public buildings, AHFC recently used Recovery Act Funding to benchmark more than 1,200 publically-owned municipal, state, and school district buildings, and completing ASHRAE Level 2 Investment Grade Audits on 327 of those buildings.\textsuperscript{63} Study results are documented in a report entitled “A White Paper on Energy Use in Alaska’s Public Facilities.” The report estimates that there may be 5,000 publicly owned buildings that cost more than $641 million in energy costs each year.

**Gap #11:** While the Sustainable Energy Act sets energy standards for new state-owned buildings, state-funded (community buildings, fire halls, city offices, schools) facilities are not included in this policy.

**Recommendation to Legislature:** Expand the policy to assure that all buildings funded by appropriations from the Alaska State Legislature are built to the same minimum energy standards as state-owned buildings.

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**OUTREACH**

Energy codes have come a long way, but there are still many people unaware of their benefits, including most consumers and policymakers. Many code officials and building and design professionals remain uninformed 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: promoting their adoption and implementation, and identifying opportunities for training, technical assistance, and other support. Given the diversity of the energy code stakeholders within the state, execution of strategic education and awareness campaigns can improve understanding of code changes, create buy-in, and help lead to greater levels of compliance.

AHFC has done some limited work to educate the public in Alaska. It worked with BCAP to produce materials to help consumers understand the importance of an energy code, and empowered them to inspect any home they are considering purchasing to determine whether it appears to comply with the BEES.\textsuperscript{xxiv} AHFC issued news releases to let the public know about the availability of these resources.

Consistent public education on the benefits of energy codes is urgently needed. CCHRC and AHFC may be best suited to lead and coordinate such an effort. There are beneficial partnerships that could be made with local governments, nonprofits, educational institutions, and utilities, to educate Alaska consumers on how they can save energy, money, and protect the environment.

**Gap #12:** Public outreach and education is needed. Citizens do not know nor understand the benefits energy codes provide.

**Recommendation to State Agencies:** Launch a public outreach and education campaign to raise awareness of the benefits of energy codes. Provide more specific consumer-oriented information about the energy code, and ways to disseminate that information. Create a web page (or expand an existing one) to share energy code information, resources, trainings, and updates. Perhaps this task can be led by the CCHRC and the AHFC.

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**ENFORCEMENT**

Enforcement provides the teeth behind adopted codes, as it is the responsibility of code officials and third-party inspectors to ensure that design and construction professionals comply with the provisions of the energy code.

While enforcement is largely the responsibility of local jurisdictions in Alaska, the state can and must play a crucial role in providing municipalities with the resources and support they need to establish effective enforcement infrastructures and practices.

As codes evolve alongside advancing technology and improvements in construction practices, it is incumbent on the state and municipalities to provide the enforcement community with access to sufficient energy code training.

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**ENFORCEMENT FOR BEES**

Meeting BEES is achieved either prescriptively, or by performance. In order to receive state financing, a standardized compliance form\(^{xxv}\) that is furnished with the mortgage package must be completed and signed by a certified individual.

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\(^{xxv}\) The forms are called the PUR-101 and PUR-102 forms. A Certificate of Occupancy from an approved municipality may be substituted for the PUR-102 form.
These forms are signed by private, for-profit inspectors licensed through the Department of Occupational Licensing. Authorized individuals may include a certified energy rater, registered architect, engineer, or International Conference of Building Officials (ICBO) certified building inspector.

For the ventilation-only portion of the form, a certified contractor, building owner, or mechanical contractor can sign off to certify that the building meets the BEES ventilation requirements. xxvi Individuals become certified to sign off on BEES compliance forms by completing an eight-hour course on the BEES, and passing a test with a score of 70 percent or higher.64 To maintain certification, individuals must retake the exam every two years. AHFC administers the certification of about 500 individuals currently.

**Gap # 13:** While AHFC financing requires homes to meet basic building codes and energy standards, other forms of financing do not.

**Recommendation to Legislature:** Ensure that all mortgage lenders require the equivalent of a code compliance certificate for building codes and energy standards, similar to the PUR-101 (Energy) and PUR-102 (building code) used by the AHFC.

**ENERGY CODE ENFORCEMENT FOR NON-BEES STRUCTURES**

Of the 388 communities in Alaska, 17 jurisdictions have adopted a building code, and of those 17, fewer have adopted an energy code. Those that have adopted an energy code may choose to enforce the code or not. According to those interviewed for this report, enforcement is overall very weak or absent in most of Alaska. Some local jurisdictions conduct inspections of insulation and vapor barriers only, but even then they often just visually inspect that they are there, not how well they are installed.

Of that handful of communities with an energy code, local enforcement varies greatly. Most cities and boroughs don’t have a building department or inspectors on staff. Of those that do, most don’t have the staff or budget to conduct visual inspections. Some jurisdictions diligently conduct plan reviews and visual inspections for energy code items (e.g.: Fairbanks); some only inspect for the vapor barrier and insulation R-values (e.g.: Anchorage, Kodiak), some also include a visual inspection

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xxvi Builders can become certified to sign off on the PUR-101 form. Every two years they must take an 8 hour class specifically on energy codes, and pass a test with a 70 percent of higher grade. AHFC tracks certification.
of sealed penetrations and window to wall area ratio (Juneau) and some don’t visually inspect at all (Sitka).

Local building department staff shared many perspectives regarding what is actually being built in the field. Some building officials feel that builders are doing “just fine,” and building homes that meet the BEES to maximize the number of potential buyers for qualifying for their homes. (Since builders don’t know in advance who will buy their home, they build to BEES in case a potential buyer wants to use state financing.)

**Gap #14:** Energy code provisions are not uniformly inspected in Alaska. Not every community is able to have a building department, and the DFLS cannot add the responsibility of ensuring code compliance in hundreds of communities across Alaska.

**Recommendation to legislature:** Following the adoption of a statewide code, this issue will need to be addressed with training and education.

The legislature can consider using the method already in place for enforcing compliance with the AHFC BEES and the International Residential Code. That is, AHFC requires a third-party inspector to conduct six inspections for each residential dwelling: plan review; foundation/footing; wall assembly; electrical; plumbing; insulation; and final. xxvii In addition, the energy provisions in every home must be inspected and confirmed with an energy rating.

In small communities where an inspector or energy rater are not available, a builder can provide videos to an inspector in place of in-person enforcement. AHFC has used this technique to inspect such things as wall framing; building location (exterior); foundation tie-downs; clips and roof ties.

**Enforcement for other codes**

While not directly related to enforcement of energy codes, it is informative to understand how the fire, safety and life codes are enforced by the state in order to get a sense of standard acceptable practice in code enforcement in Alaska. This section describes how fire and life safety codes are enforced.

The DFP reviews about 1,200 to 1,500 commercial plans each year. There are seven plan reviewers and seven fire inspectors on staff.

In order for a commercial building to receive a permit for construction, plans must be submitted to the DFP. Plans are reviewed, and if any discrepancies with the adopted code are present, they must

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xxvii This is certified on the AHFC PUR-102 form.
be corrected prior to issuing a building permit. Once the plans adhere to the applicable code, a building permit is issued.

The DFLS defers authority to certain local jurisdictions to adopt building and construction regulations (fire, safety, and life codes must be as least as stringent as the DFLS requirements); issue building permits; establish and collect fees for permits; and conduct inspections. These local jurisdictions have received “deferred jurisdiction” and administer the commercial fire and life safety codes locally: Anchorage, Juneau, Fairbanks, Kenai, Ketchikan, Seward, Kodiak, Sitka, Soldotna, University of Alaska Fairbanks, Wasilla/Lakes. In these jurisdictions, the commercial code is enforced by a local building department with ICC certified plan reviewers and inspectors.

In these communities, plans are submitted to the city building department rather than the state. Enforcement practices vary greatly – some jurisdictions visit a building site multiple times, and others only review plans but do not conduct visual inspections.

Outside of the deferred jurisdictions, the DFP is responsible for the fire and life safety code enforcement. However, due to the climate, lack of roads, and sheer size of the state, the DFP cannot travel to inspect all buildings that have applied for a permit --the cost for flying to many of the roadless areas of the state is beyond the budget allocation of DFP. Therefore, the DFP prioritizes the largest building projects, and may conduct one or more inspections on those buildings. Buildings valued at under $5 million may not get any visual inspections whatsoever. However, as funding permits, the DFP attempts to visit jurisdictions at least once per year, and will inspect any buildings under construction at that time – it will inspect buildings in whatever stage of construction they happen to be in at the time. Many commercial buildings are not visually inspected at all.

Regarding the Uniform Plumbing, National Electrical Code, Boiler Code, Construction Code, no plan reviews are conducted for items other than elevators.

All boiler inspections statewide are done by the Department of Labor and Workforce Development (DOLWD) – deferred jurisdictions do not have inspection authority over those. DOLWD has three electrical inspectors, two plumbing inspectors, and one boiler inspector that perform about 1,000 electric and 1,000 plumbing inspections annually. As travel costs are prohibitive, many projects do not get visually inspected, or rely on photographs in lieu of visual inspections.65

**EXISTING BUILDINGS**

Energy code enforcement for existing buildings varies widely between jurisdictions. In the handful of jurisdictions with building departments and with an adopted energy code, some diligently enforce their code; most do not. As the majority of the state has no energy code and no building department, the majority of alterations and additions to existing buildings do not have energy codes enforced.
In order to use state financing for a major commercial or residential remodeling project that includes an addition, a BEES certificate is required. If a major remodeling project occurs on an existing structure but does not include an addition, the BEES is not required for state financing.

**Gap # 15:** In Alaska, there are no energy requirements for existing building alterations, except for those that include an addition and want to use state-financing.

**Recommendation to the Legislature:** Give adoption authority to one state department to develop an energy code for the state.

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**BARRIERS ACCORDING TO ENFORCEMENT PROFESSIONALS**

**MUNICIPAL GOVERNMENT SYSTEM**

A major barrier to stronger energy code enforcement is fragmentation due to the state’s system of government. While conducting research for this report, BCAP spoke with about 40 state and local government officials and other stakeholders. It was clear from those interviews that since Alaska is geographically such a large state with a sparsely and widely dispersed population, there is a strong mentality of home rule. Local jurisdictions are very focused on their own community, and are typically not accustomed to thinking at a state or national level – municipalities respect one another and trust that each is best suited for making their own decisions.

Also, because the sources and delivery of energy are unique to each community or region, each area has its own pricing structure and concerns. This structure of distributed government and energy systems creates unique challenges for the state. While Americans in the continental US tend to naturally think on a state-level for many issues, in Alaska, it seems that almost all issues are local.

**Gap # 16:** The strong “home rule” culture in Alaska may be a barrier for the adoption of one statewide energy code. Critics of the idea cite the major differences in climates from one area to another in the state.

**Recommendation AHFC or appropriate state agencies:** In interviews for this report, critics of the single statewide energy code concept seem more amenable to accepting the concept of “regional” energy codes for the state as currently defined by the AHFC BEES. The state should consider framing the adoption of four regional codes based on the unique climate regions in Alaska as currently defined by the AHFC BEES.

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**LACK OF PRIORITY**

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**xxviii** See the Acknowledgements section of this report for a list of those interviewed for this report.
Code officials and third-party enforcement professionals interviewed cite a lack of priority for energy code enforcement as the largest barrier to full energy code compliance. Many believe that their primary mission is to ensure the health and safety of occupants. They don’t see the important role the energy code plays in overall health, safety, and welfare considerations.

Some enforcement professionals interviewed mentioned that some of their colleagues view the energy code as a purely political issue and an example of the national government pushing its priorities against local government’s will. In this context, energy code enforcement is seen as an unnecessary burden on already overworked public servants. Though this belief is not pervasive among enforcement professionals, it does represent an important view in many parts of Alaska regarding federal-state and state-local politics. Working with these beliefs can only be accomplished by Alaskan energy code champions in the state government. Consistent outreach efforts that stress the importance of energy codes to life, health and safety (stronger economies, improved indoor air quality, reduced pollution) are critical for working with such attitudes.

According to local officials interviewed, many homes are built with energy efficiency in mind, even in the absence of an energy code, for these main reasons:

- The buyer believes it will save them money by saving energy;
- The financial institution issuing the loan requires a specific standard; xxix
- The builder chooses to build to the AHFC BEES standard

One local building department representative said: “Energy prices are high but... there are enough rebates available, and I feel it’s fine the way it is.”

Regardless of the reasons, enforcement professionals who do not value the energy code as integral to occupant health and safety are less likely to attend trainings, issue stop-work orders for energy code violations, or integrate the code into their established routines, particularly if energy conservation and efficiency are not high among the values embraced by a community. Enforcement department directors must be energy code champions who prioritize energy code enforcement and work to communicate this attitude to the building and design professionals they work with. Support for proper energy code enforcement must also come from local decision-makers, who should prioritize code enforcement as a crucial economic mechanism that keeps money in the local community—and follow through with adequate funding for inspection departments to carry out their duties.

**Gap #17:** Most enforcement professionals do not make energy codes a priority.

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xxix In research for this report, no lenders were identified that required a specific standard in order to qualify for their loan product.
Recommendation for State Agencies: The state will need to lead in making energy efficiency a priority for the state and encourage local governments to increase the priority they place on energy standards. Energy raters are available in virtually all hub communities in rural Alaska, and most communities on the road or ferry system. Energy raters can certify a home meets the energy standards. Only with state leadership will local enforcement professionals begin to prioritize the enforcement of energy codes alongside more traditional building codes. The state could further incentivize learning about energy codes by offering continuing education credits to licensed construction trade individuals.

LACK OF STATE LEADERSHIP

As discussed throughout this report, there is a significant lack of state leadership on energy codes in Alaska. The legislature has not authorized the Department of Public Safety nor any other department (AHFC is not a state department with the authority to adopt a statewide code) to adopt such a code. Without the legislature’s approval, there cannot be a statewide, regionally-based energy code.

LACK OF KNOWLEDGE

Local government officials and other stakeholders interviewed for this report are unaware of the federal taxpayer-funded programs that invest in energy efficiency retrofits or bill payment assistance, and how they relate to energy codes. There is a widespread disconnect in the minds of the most important stakeholders – local government officials – in the idea that making homes more energy efficient during construction will reduce energy bills and the need for ongoing taxpayer-funded programs for the people of Alaska in the long-term. As long as Alaska continues to not set energy efficiency standards for new structures in the state, in-efficient structures will continue to be built, and homeowners will continue to need state and federal funds to pay bills and retrofit their in-efficient homes.

In contrast to the widespread lack of priority at the local level, the state has a highly important resource with local experts in the CCHRC. CCHRC is a tremendous and unique asset to the state. In addition, the state has three knowledgeable and accessible centers that conduct training for BEES. They are the Alaska Building Science Network, Alaska Craftsman Home Program, Inc., and Wisdom & Associates, Inc.

CERTIFICATION AND LICENSING

DESIGN PROFESSIONALS
Under the Department of Commerce, Community and Economic Development (DCCED), the Alaska State Board of Registration provides licensure for architects, electrical, mechanical and civil engineers, land surveyors, home inspectors and other trades. In order to maintain their license, individuals must earn 24 hours of Continuing Education (CE) credit every two years.

**CODE ENFORCEMENT PROFESSIONALS**

At the local level—where a code department exists, the majority of code enforcement professionals have obtained the appropriate ICC certifications and obtain regular CEU to maintain their certifications.

Currently, AHFC oversees certification for the energy raters and inspectors that certify compliance with BEES. Many of these inspectors are considered “Combination Dwelling Inspectors” as they are also licensed to conduct home inspections. As licensed individuals have to submit paperwork and re-licensing applications biennially to at least two separate state entities (AHFC and the Division of Corporation and Professional Licensing (DCPL)), this is an inefficient certification/licensing system.

**Gap #18:** AHFC is currently in the role of overseeing the authorizing energy raters, which is not a core competency of AHFC and an inefficient system for both the state, and individuals that must go to two separate state entities for license renewal.

**Recommendation to Governor or Legislature:** Streamline the administration of energy raters by moving responsibility for certification and biennial license renewal to the DCPL. The DCPL carries out laws governing home inspectors in Alaska which is better qualified and experienced to oversee such licensing.

**CONSTRUCTION PROFESSIONALS**

The Department of Commerce, Community and Economic Development (DCCED) adopts regulations to carry out laws governing construction contractors in Alaska, while its Division of Corporations, Business and Professional Licensing administers the contractor program.

All general contractors must have an Alaska Business License, a surety bond, and proof of insurance. There are two basic categories for General Contractors:

1. **General Contractor Without Residential Contractor Endorsement:** For those that do commercial work or residential remodel work worth less than 25 percent of the value of the structure. There are about 2,277 of these contractors in Alaska.

2. **General Contractor with a Residential Contractor Endorsement license.** For those that do new home construction or remodeling work worth greater than 25 percent of the value of the structure being altered. There are about 1,100 of these contractors in Alaska.
In order to obtain the latter, *residential* contractors must:

1. Successfully complete the Alaska Craftsman Home Program (ACHP) or its equivalent, or a post-secondary course in Arctic engineering or its equivalent;

2. Get an Endorsement Application for Residential Construction from the Department of Commerce, Community and Economic Development;

3. Pass a 100 question, multiple choice question test with a score of 70 percent or higher. Exam content includes: carpentry, finishes, concrete, thermal and moisture protection, masonry, safety, doors and windows, equipment and tools, metals, sitework, building code and inspection, general plan reading;

4. Obtain a business license.

**ABOVE-CODE PROGRAMS**

**LEADERSHIP IN ENERGY AND ENVIRONMENTAL DESIGN (LEED)**

The U.S. Green Building Council’s (USGBC) Leadership in Energy and Environmental Design (LEED) Green Building Rating System is a nationally accepted benchmark for the design, construction, and operation of high performance green buildings. There are very few LEED certified buildings in Alaska. The USGBC Cascadia chapter represents several states and areas, including Alaska.

**ENERGY STAR FOR HOMES**

New ENERGY STAR qualified homes are more efficient than typical new homes. According to the ENERGY STAR website, there are no ENERGY STAR registered builders in the state,xxx and no lenders that offer energy improvement mortgages from the Federal Housing Administration (FHA) and Veterans Affairs (VA).⁷⁷ The number of ENERGY STAR certified homes built to-date in Alaska is unknown, but during interviews with local jurisdictions and other stakeholders, it appears there are few to no ENERGY STAR homes in the state, with the exception of some factory-built manufactured homes that are shipped into the state. Alaska has its own “Star” rating system, with $7,500 state rebates available

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.xxx Prior to a major change in the scoring methodology for ENERGY STAR homes, there were ENERGY STAR homes in Alaska. But since ENERGY STAR relies on a HERS rating, and Alaska has its own star rating system, the Alaska-specific program dominates the market where ENERGY STAR might otherwise.
for buyers of highly efficient homes, which acts very much like the ENERGY STAR program in other U.S. states.

**BUILDERS CHALLENGE**

The Builders Challenge is one of DOE’s residential building-efficiency programs established in 2008.\(^{71}\) It is similar to the ENERGY STAR for new homes program in that both programs assist and reward builders who build homes that are more efficient than conventional new homes. However, the energy threshold requirements for the Builders Challenge program are slightly different than the ENERGY STAR new homes program\(^{xxx}\) because it incorporates innovative solutions and best practices proven by Building America in addition to the ENERGY STAR for Homes Version 3 requirements;\(^{72}\) Building America is a research program initiated by DOE to improve advanced residential building energy technologies, strategies, and practices.\(^{73}\) When a home meets all three requirements, it earns an “Energy Smart Home Scale” label (E-Scale).

More than 10,000 high-performance homes have been constructed under this program as of January 2012 and “have generated an estimated energy cost savings of nearly $15 million and slashed 71,000 tons of carbon emissions since 2008.”\(^{74}\) DOE is in the process of updating the Builders Challenge program to increase energy efficiency requirements and save up to 40 percent more energy than that achieved with the 2009 energy codes.\(^{75}\)

It appears that there are no organizations participating in the program in Alaska.\(^{76}\)

The Builders Challenge program would help educate Alaska builders on how to improve the housing stock by educating and encouraging builders to embrace high-performance building approaches and technologies.

**Gap #19:** The use of third party, above-code energy efficiency programs should be further promoted and expanded and better coordinated.

**Recommendation for state agencies:** The state could consider forming a network of the organizations that focus on above-code programs to better coordinate efforts across Alaska.

\(^{xxx}\) The Home Energy Rating System Index (HERS) is a scoring system that provides a scale for measuring the energy efficiency of a new or existing home compared to a reference home that was built to the 2006 IECC, which is assigned the score of 100 points. The lower a home’s HERS Index, the more energy efficient it is. For every 1 point decrease in the HERS Index it corresponds to a 1 percent reduction in energy consumption compared to the HERS reference home. For example, a home that scores 85 is 15 percent more efficient than the HERS reference home, and a home that scores zero is a home that is a net zero user of energy (see www.resnet.us for more details). Homes that meet the Builders Challenge qualifications score 70 or less on the scale (or are 30 percent more efficient than a typical new home). Homes that meet ENERGY STAR qualifications score 85 or less on the scale (or are 15 percent more efficient than a typical new home). Both programs intend to increase the stringency of their requirements in the coming months.
The AHFC New Home Rebate program offers a financial incentive of $7,500 to buyers of new homes that have earned a 5 Star Plus home rating - the highest energy rating a home can achieve using AHFC’s AkWarmTM Energy Rating System. AKWarm is a home energy rating software program that analyzes and rates the energy efficiency of a building envelope, heat-loss issues, and heating systems in residential buildings in Alaska. This market-transformation program incentivizes homebuyers to shop for a 5 Star Plus Home in order to receive the $7,500 following their purchase, and heightens demand for energy efficient housing in Alaska.

**MEASUREMENT AND VERIFICATION**

The first step in understanding the current level of compliance with energy codes is to measure and verify compliance. 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.

It is critical that the effectiveness of energy code compliance is measured to help determine the areas in which compliance is lacking and develop enforcement and compliance strategies that address these deficiencies. Alaska has not conducted a formal study to evaluate the level of compliance in either the few local jurisdictions that have adopted an energy code, nor a study to audit the BEES program. It should be noted that most states and municipalities are in the same position as Alaska.

The AHFC has a database called ARIS that holds information on about 70,000 of the 283,000 occupied homes in Alaska. The data contained ARIS is a tremendous resource in analyzing the efficiency of the homes and buildings that have been tested. For example, it is presently being used as a basis for a housing assessment that will identify trends and uncover common deficiencies in an Alaska Native Settlement Claims Act (ANCSA) region, hub and surrounding communities (and therefore determine specific training and retrofit needs). This report will paint a picture of what

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**xxxii** The AkWarm Energy Rating System is very similar to the HERS scoring system described above. However, it is an Alaska-specific software program to rate homes in Alaska, using state-specific data and climate information.

**xxxiii** The database is called the Alaska Retrofit Information System (ARIS).
housing has been retrofit where, what remains to be done, and perhaps a guide to where various state, federal agencies and housing authorities should focus. Also using the information from this database, AHFC recently (October 2012) completed a study on about 327 audited commercial buildings to better understand energy use and costs in commercial buildings and public buildings. The study’s findings were published in a report entitled *A White Paper on Energy Use in Alaska’s Public Facilities*.

The results of these studies cannot be assumed to represent statewide compliance rates, because there is an inherent bias in the AHFC data, as many of the buildings in the system were pre-disposed to being more energy efficient – i.e. builders wanted to make sure their buildings complied with BEES in order to ensure that all potential buyers are eligible for AHFC financing; or existing home owners wanted to improve their homes using the AHFC rebates and had sufficient up-front assets to pay for the retrofit work and wait for a rebate. At the other end of the financial spectrum, weatherization assistance participants were selected based on income.

The state does not have a similar database of randomly selected new homes and commercial buildings from which to draw a more comprehensive and accurate picture of statewide code compliance. Therefore, the state has a very good basis from which to begin a comprehensive study, but does not know (other than anecdotally from building code inspectors in some communities, xxxiv) how energy efficiently other new homes and commercial buildings are being built.

**Gap #20:** Alaska has not conducted a statewide measurement and verification study to determine the current status of non-AHFC rebated or financed residential and commercial buildings.

**Recommendation for state agencies and the legislature:** The state should take actions to measure and verify the current status of energy efficiency in new residential and commercial construction in order to get a comprehensive understanding of the current status of how energy efficiently homes are being built, where the problems are, and where code compliance is working well. The state should review the DOE’s recommended methodology for conducting a compliance study, the results and lessons learned from states that have conducted their own compliance studies. It could then review the existing AHFC database and resources, and determine an appropriate approach for a study in Alaska.

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xxxiv In research for this report, code officials described code enforcement effort as being either non-existent (building department inspectors do not look for energy provisions at all) or somewhat existent (building department inspectors look for insulation and vapor barriers only – some expect and enforce proper installation, other do not and just look to see if insulation and a vapor barrier is in the home). Other building department enforcement professionals say that homes are being commonly built to AHFC BEES standards and that although they do not consistently inspect for all energy provisions in an energy code, they believe that builders do an excellent job of building efficiently.
The Alaska study may contain two main parts: (1) Continuing to assess what information can be learned about energy code compliance from the AHFC database, and comparing that to the number of new home and commercial buildings to determine how many homes are confirmed by a third-party to have met code (and other insights from the AHFC data); and (2) a study of home and commercial buildings not in the AHFC database, including communities that have – and have not - adopted an energy code. The results can be compared to a baseline energy code such as the 2009 IECC or AHFC BEES to derive a baseline from which to measure future compliance.

**Gap #21:** Alaska does not have an overarching group of state and industry stakeholders to plan and lead initiatives toward energy code compliance.

**Recommendation appropriate state agency:** The state should consider taking a leadership role in the creation of an *Energy Code Compliance Collaborative*. A *Collaborative* is a diverse group of knowledgeable and influential stakeholders responsible for advising the state on energy code implementation and carrying out the tasks necessary to ensure greater compliance with the energy code. The Collaborative provides a forum for all stakeholders impacted by energy codes to come together to work toward common interests in energy code compliance.

A successful Collaborative relies on a broad range of stakeholders and interests and an inclusionary process that welcomes all parties to the table. The collaborative process is based on the principle that success requires bringing affected stakeholders into discussion for the purpose of working through issues and developing consensus and support for energy codes.

The Collaborative will know what can realistically be implemented statewide and be able to advise the state on how to prioritize and carry out the tasks necessary to ensure greater compliance with the energy code.

**BEST PRACTICES:**

Alaska’s best practices that other states can replicate are listed below:

- General contractors are required to be licensed, and *residential* contractors must complete a course and pass a test.
- The state has demonstrated its commitment to improving the energy efficiency of its buildings by enacting the Sustainable Energy Act.
• The state is leading by example by setting updated energy standards for state-owned buildings. Leading by example in new or renovated buildings familiarizes and trains the construction industry and code enforcement officials and stimulates local economies by increasing the demand for energy efficiency products from product suppliers, manufacturers and service providers. It also demonstrates responsible government stewardship of tax dollars by reducing energy bills for the lifetime of a building.
• AHFC has a database of thousands of homes and commercial buildings that have been rated for compliance with the BEES.
• CCHRC has reported the outcomes of the energy efficiency retrofit programs and is in the process of evaluating and reporting on the status of Alaska’s housing stock, using As-Is and Post rating data as a proxy for the un-rated housing.
• Having CCHRC in the state is a tremendous resource for expertise, data, and builder relations.
GAPS & RECOMMENDATIONS

**Gap #1:** There is no organized permitting process in Alaska. If a home is built in many communities, there is no tracking mechanism for the state knowing that it was built.

**Recommendation to appropriate state agency:** Following the adoption of a statewide building code, the state should assist local jurisdictions by establishing a statewide system for reporting new construction starts and remodels.

**Gap #2:** Many people interviewed for this report do not see a connection between the high cost of energy in Alaska and the benefit energy codes would bring to Alaskan homeowners, businesses, municipalities, the state and federal governments.

**Recommendation to AHFC or appropriate state agency:** Stakeholders need information about the relationship between the high costs of energy in areas outside of Anchorage and Mat-Su and the benefits that energy codes would bring. This information should include: the amount of state and federal dollars currently funding efforts to reduce energy bills for Alaskans; the potential ongoing monetary savings that can be achieved with an energy code; the increased comfort of energy efficient homes and buildings; strengthening of Alaska’s economy by reducing energy bills for businesses, non-profit organizations, municipalities, state and federal governments; that a statewide energy code would level the playing field for builders; and that energy efficiency increases a family’s take-home pay by reducing monthly costs.

Further, the state is in need of widespread education of stakeholders in Alaska – local jurisdictions, the Alaska Municipal League (AML), and others should be targeted as a high priority for getting information out. Information could be delivered at conferences or meetings, such as the Department of Public Safety meeting held in Anchorage where local deferred jurisdictions meet to discuss code related matters each year.

**Gap #3:** While the state has established a goal to achieve a 15 percent increase in energy efficiency on a per capita basis between 2010 and 2020, there appears to be no single agency responsible for overseeing this goal, no funding assigned to this task, and no coordinated formal action toward this goal was found during research for this report.

**Recommendation to Governor:** The state should assign a lead agency or department responsible for achieving this goal. In the short-term, it would be efficient to assign or at least link the responsibility for this task to the same agency responsible for collecting state energy bill data (assigned to the Department of Commerce, but currently being done by
AHFC, which could be assigned to lead this task), or the state Department of Transportation and Public Facilities, as it is charged with improving the energy efficiency of state owned buildings (a related task).

**GAP #4:** Municipalities are likely not aware that they can receive technical assistance, and, other than Anchorage, have not requested assistance related to residential and commercial building codes and energy efficiency codes and standards.

**Recommendation to AHFC and AEA:** The state should offer formal assistance and education to municipalities to support their inquiries and needs as they consider adopting or updating an energy code. The state will need to make municipalities aware that such service is available. Perhaps the AML can assist with this task. As a side benefit, it may educate AML and bring them aboard as supporting partners in the effort.

**GAP #5:** The state does not have one agency or department to oversee climate change impact or a policy that could help support energy codes as a part of a larger statewide effort.

**Recommendation for legislators / Governor:** Adopt an Energy Plan to raise awareness statewide of the importance of energy efficiency and the benefits it can bring to Alaska. Energy codes should be incorporated into the plan as a way to assure that all new buildings and homes use less fossil fuel derived energy.

**Gap #6:** There is a widespread disconnect in the minds of the most important stakeholders – local government officials – making the connection between making homes more energy efficient during construction or renovation and reducing energy bills and the need for state funded programs for Alaskans in the long-term. As long as Alaska fails to adopt energy efficiency standards for new structures in the state, inefficient structures will continue to be built, and building owners will continue to need state and federal funds to pay bills and retrofit their inefficient buildings.

**Recommendation to state agencies:** Educate local government officials on the importance of energy codes. Conduct targeted outreach to local officials and other related stakeholders such as the AML, the home builder associations, and others to increase support for energy codes.

**Gap #7:** Building codes and energy efficiency codes can be complex and confusing, and the absence of a single state department for code matters leaves local jurisdictions without a “go-to” source for information and support.

**Recommendation to Governor/Legislature:** Assign one state department the responsibility for all building and energy codes, to assure consistency throughout the state in code related matters; and to provide local jurisdictions and state agencies with one go-to point for all
code related matters. As the DFLS is the agency most commonly considered the de-facto building department, it could be assigned this role. However, since it has not previously dealt with energy code issues, a Codes Advisory Committee should be formed to advise the DFLS in energy code matters. The Cold Climate Housing Research Center published a report in June of 2012 entitled “Statewide Codes White Paper”, which describes how such a committee could be formed. See that report for additional information.

**Gap #8:** No state-level entity is authorized by the Legislature to adopt energy codes.

**Recommendation to Stakeholders:** Form a coalition of stakeholders to raise this issue with legislators and the Governor. Elected state officials, local governments, and other decision-makers need to be educated on the importance of building and energy codes to Alaska, and that one state-level agency or department needs to be assigned to a leadership role for codes. Obviously, this will take a great deal of collaboration, meeting, and education of influential individuals in order to develop the collective strength and political will of a critical mass of stakeholders to influence the legislature. The CCHRC and AHFC should continue to convene stakeholders to educate them and build a coalition that can influence decision-makers on the benefits of energy codes; the importance of streamlining state oversight of building codes.

**Gap #9:** There is no statewide energy code requirement for either residential or commercial buildings in Alaska. Some feel that the current fragmented structure of having different codes in different jurisdictions, no codes in many areas, and the lack of one state agency administering codes is inefficient and unnecessarily confusing. Individual jurisdictions adopt whatever codes they want, or no codes at all. The absence of a singular statewide building and energy code for commercial and residential codes in Alaska result in:

- A patchwork of adopted Commercial codes which has created a complicated system for Commercial code enforcement in Alaska.
- An undue burden of inefficiencies for general contractors during the permitting process, as a general contractor has to go to two or three different agencies to get the appropriate sign-offs needed for construction.xxxv
- Confusion by designers, builders and others about which code is required in which jurisdiction and for which type of ownership of buildings.xxxvi
- In-eligibility of home buyers for AHFC financing if the local code isn’t as stringent as the AHFC BEES.

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xxxv Builders may have to complete paperwork for the Department of Public Safety, the Department of Labor and Workforce Development and the Alaska Housing Finance Corporation.

xxxvi There are different codes for privately-owned and financed buildings versus state-owned buildings, versus those that get AHFC funding.
• Alaskans living in potentially unsafe, unhealthy, and unnecessarily inefficient homes.
• Alaska businesses, non-profit agencies, municipalities, and the state and federal government operating in unnecessarily inefficient buildings.

**Recommendation for Governor’s office:** Local governments need leadership from the state on this issue. While the Governor has not taken a stance on energy codes, the Alaska Sustainability Act authorizes AHFC to cooperate with AEA to provide technical assistance to municipalities related to residential and commercial building codes and energy efficiency standards. Although some feel that one state energy code would not be feasible for Alaska due to its multiple distinct climates, several local building officials interviewed for this report seem receptive to the concept of regional energy codes, as presently found in BEES. As there has historically been no over-arching energy code for the state, the system for enforcement and the specific issues related to administering such a code will need to be developed, such as enforcement costs, personnel, training, and more. There are a few options that should be considered by the state:

1. The state could adopt a statewide commercial and residential building code that includes an energy code.

2. The state could adopt an energy code independent from a statewide building code. For example, in Louisiana and Illinois, a statewide energy code is now in place, although the state remains home rule for other building code aspects.

3. The state could create a Building Codes Commission responsible for adopting a building and energy code for the state.

CCHRC and AHFC have begun to hold meetings to discuss such issues with stakeholders. CCHRRC and AHFC should continue and expand their efforts and form a coalition. A coalition of widespread supporters may demonstrate to the Governor and other influential decision-makers that the DFLS or another state entity should be allowed to take on more of a supporting role in developing regional codes for the state.

**Recommendations for Legislature:**

The Legislature should assign one state agency as the authority on building codes, including an energy code. The Department of Public Safety seems the most readily available and qualified agency for this role.

AHFC and CCHRC have convened coalitions and begun to educate stakeholders on the importance of energy codes. They should continue to convene stakeholders and take slow steps toward educating and engaging necessary stakeholders in order to change the structure of building code administration in the state. They need additional support from
influential decision-makers stakeholders in other state departments and organizational stakeholders such as the municipal league.

**Gap #10:** Energy codes can be complex and confusing, and the absence of a single state department for energy code matters leaves local jurisdictions without a “go-to” source for information and support.

**Recommendation to Governor:** Assign one state department with the responsibility for all building codes, in order to assure consistency throughout the state in code related matters; and to provide local jurisdictions and state agencies with one go-to point for all energy code related matters. As the DFLS is the agency most commonly considered the de-facto building department, it could be assigned this role. However, since it has not previously dealt with energy code issues, a Codes Advisory Committee should be formed to advise the DFLS in energy code matters. The CCHRC published a report in June of 2012 entitled “Statewide Codes White Paper”, which describes how such a committee could be formed. See that report for additional information.

An alternative solution would be to assign a lead agency to provide guidance and technical support to local jurisdictions that have questions regarding energy code adoption and implementation. AHFC may be best qualified for this role, but funding would needed to expand its services to assist jurisdictions.

The Sustainable Energy Act also gives the Alaska Energy Authority the power to “promote energy conservation, energy efficiency, and alternative energy through training and public education.” As such, AEA could assist in getting the word out to all state agencies that this new service is available.

**Gap #11:** While the Sustainable Energy Act sets energy standards for new state-owned buildings, state-funded (community buildings, fire halls, city offices, schools) facilities are not included in this policy.

**Recommendation to Legislature:** Expand the policy to assure that all buildings funded by appropriations from the Alaska State Legislature are built to the same minimum energy standards as state-owned buildings.

**Gap #12:** Public outreach and education is needed. Citizens do not know nor understand the benefits energy codes provide.

**Recommendation to State Agencies:** Launch a public outreach and education campaign to raise awareness of the benefits of energy codes. Provide more specific consumer-oriented information about the energy code, and ways to disseminate that information. Create a web
page (or expand an existing one) to share energy code information, resources, trainings, and updates. Perhaps this task can be led by the CCHRC and the AHFC.

**Gap # 13:** While AHFC financing requires homes to meet basic building codes and energy standards, other forms of financing do not.

**Recommendation to Legislature:** Ensure that all mortgage lenders require the equivalent of a code compliance certificate for building codes and energy standards, similar to the PUR-101 (Energy) and PUR-102 (building code) used by the AHFC.

**Gap #14:** Energy code provisions are not uniformly inspected in Alaska. Not every community is able to have a building department, and the DFLS cannot add the responsibility of ensuring code compliance in hundreds of communities across Alaska.

**Recommendation to legislature:** Following the adoption of a statewide code, this issue will need to be addressed with training and education.

The legislature can consider using the method already in place for enforcing compliance with the AHFC BEES and the International Residential Code. That is, AHFC requires a third-party inspector to conduct six inspections for each residential dwelling: plan review; foundation/footing; wall assembly; electrical; plumbing; insulation; and final. In addition, the energy provisions in every home must be inspected and confirmed with an energy rating.

In small communities where an inspector or energy rater are not available, a builder can provide videos to an inspector in place of in-person enforcement. AHFC has used this technique to inspect such things as wall framing; building location (exterior); foundation tie-downs; clips and roof ties.

**Gap # 15:** In Alaska, there are no energy requirements for existing building alterations, except for those that include an addition and want to use state-financing.

**Recommendation to the Legislature:** Give adoption authority to one state department to develop an energy code for the state.

**Gap #16:** The strong “home rule” culture in Alaska may be a barrier for the adoption of one statewide energy code. Critics of the idea cite the major differences in climates from one area to another in the state.

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xxxvii This is certified on the AHFC PUR-102 form.
Recommendation AHFC or appropriate state agencies: In interviews for this report, critics of the single statewide energy code concept seem more amenable to accepting the concept of “regional” energy codes for the state as currently defined by the AHFC BEES. The state should consider framing the adoption of four regional codes based on the unique climate regions in Alaska as currently defined by the AHFC BEES.

Gap #17: Most enforcement professionals do not make energy codes a priority.

Recommendation for State Agencies: The state will need to lead in making energy efficiency a priority for the state and encourage local governments to increase the priority they place on energy standards. Energy raters are available in virtually all hub communities in rural Alaska, and most communities on the road or ferry system. Energy raters can certify a home meets the energy standards. Only with state leadership will local enforcement professionals begin to prioritize the enforcement of energy codes alongside more traditional building codes. The state could further incentivize learning about energy codes by offering continuing education credits to licensed construction trade individuals.

Gap #18: AHFC is currently in the role of overseeing the authorizing energy raters, which is not a core competency of AHFC and an inefficient system for both the state, and individuals that must go to two separate state entities for license renewal.

Recommendation to Governor or Legislature: Streamline the administration of energy raters by moving responsibility for certification and biennial license renewal to the DCPL. The DCPL carries out laws governing home inspectors in Alaska which is better qualified and experienced to oversee such licensing.

Gap #19: The use of third party, above-code energy efficiency programs should be further promoted and expanded and better coordinated.

Recommendation for state agencies: The state could consider forming a network of the organizations that focus on above-code programs to better coordinate efforts across Alaska.

Gap #20: Alaska has not conducted a statewide measurement and verification study to determine the current status of non-AHFC rebated or financed residential and commercial buildings.

Recommendation for state agencies and the legislature: The state should take actions to measure and verify the current status of energy efficiency in new residential and commercial construction in order to get a comprehensive understanding of the current status of how energy efficiently homes are being built, where the problems are, and where code compliance is working well. The state should review the DOE’s recommended methodology for conducting a compliance study, the results and lessons learned from states that have
conducted their own compliance studies. It could then review the existing AHFC database and resources, and determine an appropriate approach for a study in Alaska.

The Alaska study may contain two main parts: (1) Continuing to assess what information can be learned about energy code compliance from the AHFC database, and comparing that to the number of new home and commercial buildings to determine how many homes are confirmed by a third-party to have met code (and other insights from the AHFC data); and (2) a study of home and commercial buildings not in the AHFC database, including communities that have – and have not - adopted an energy code. The results can be compared to a baseline energy code such as the 2009 IECC or AHFC BEES to derive a baseline from which to measure future compliance.

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A successful Collaborative relies on a broad range of stakeholders and interests and an inclusionary process that welcomes all parties to the table. The collaborative process is based on the principle that success requires bringing affected stakeholders into discussion for the purpose of working through issues and developing consensus and support for energy codes.

The Collaborative will know what can realistically be implemented statewide and be able to advise the state on how to prioritize and carry out the tasks necessary to ensure greater compliance with the energy code.
The combination of an extreme climate, lack of access to affordable energy, and lack of state policies that protect buyers from inadequately weatherized housing have burdened residents of Alaska with high energy costs and burdened the state government with paying to help people reduce their bills. Over time, people settled and continue to settle in communities across the state, and new homes and buildings were built and continue to be built today without proper consideration of energy efficiency. For as long as energy codes are absent in the state, Alaskans will continue to be unprotected from rising energy prices, and will be oppressed by uncomfortably cold structures and/or high energy costs.

Building energy codes present a significant opportunity to reduce Alaskan’s energy costs, and improve their standard of living. Adopting an energy code is an important goal for Alaska.

The Sustainable Energy Act and the state goal of reducing energy consumption by 15 percent by the year 2020 are encouraging signs that elected officials may be interested in taking stronger action to improve the energy efficiency of buildings. The state now requires that new state-owned buildings be built to updated energy standards. The state can demonstrate fiscal responsibility with taxpayer dollars by setting an example and publicizing efforts to reduce energy consumption in public buildings.

The AHFC has taken a strong leadership role in the development of programs designed to help Alaskans improve the energy efficiency of their homes and businesses. Alaska is fortunate to have the AHFC’s leadership, and the support of AEA and the CCHRC. However these agencies need additional support from other state departments and agencies to make more comprehensive improvements in housing and buildings in Alaska. That is, the energy code should not be limited to state-financed structures, but rather should be applicable to all new or renovated structures in Alaska.

Local political and building officials and design and construction professionals need more information about how energy codes help Alaskans. The recommendations made in this report will help guide state and local officials and other interested stakeholders as they work to support code adoption and implementation. Local governments and other stakeholders would benefit from the state taking more of a leadership role in raising awareness about the importance of energy codes in Alaska. Three important first steps that the state could take are:

1. Authorize the DPS to adopt an energy code.
2. Create an advisory commission of local experts to assist the DFLS as it considers the best way to implement energy codes in Alaska.
3. Create a central location for supporting state agencies and local governments that have energy code related questions.

4. Participate in and take a leadership role in the CCHRC and AFHC stakeholder meetings to better understand local concerns and needs.

With these first steps, the state will begin to move forward in protecting its citizens from rising energy costs and uncomfortable dwellings. Energy codes are a policy tool that can reduce the cost of living and the cost of doing business in the state, and improve the quality of life for all Alaskans.
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We greatly appreciate the time and insights shared by state and local government officials, and other interested parties across the state that provided crucial insights to document and analyze energy code issues in Alaska. In particular, we thank:

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**Cold Climate Housing Research Center:** Dr. John Davies, Senior Researcher – Energy Policy

**Department of Public Safety, Division of Fire, Safety and Life:** Kelly Nicolello, Director; and Larry Beal, Building Plans Examiner

**Department of Labor and Workforce Development, Labor Standards and Safety Division:** Al Nagel, Director

**Department of Health and Social Services, Division of Public Assistance:** Susan Marshall, Heating Assistance Program Coordinator

**Department of Education & Early Development:** Michael Gaede, Building Management Specialist, Facilities

**Department of Commerce, Community, and Economic Development - Division of Corporations, Business and Professional Licensing:** Dave Rose, Licensing Examiner, Construction Contractors

**City of Anchorage Building Department:** Ross Noffsinger, Manager of Engineering Services Dept.

**City of Cordova Planning Department:** Sam Greenwood, City Planner

**City of Fairbanks Building Department:** Clem Clooten, Building Official and Dave Missick, Commercial Building Inspector

**City of Ketchikan:** Chuck Dearden, Building Official

**City & Borough of Juneau:** Charlie Ford, Building Official

**City / Borough of Juneau:** McLean Steadman, Building Inspector II

**City of Kenai:** Larry Floyd, Building Official

**City of Kodiak:** Doug Mathers, Building Official

**Matanuska-Susitna Borough:** Michelle Wagner, Administrative Secretary

**City and Borough of Sitka:** William Stortz, Building Official

**Association of Alaska Housing Authorities:** Heather Arnett, Statewide Administrator

**Tlingit-Haydai Regional Housing Authority:** Louise Kadinger, Rental Program Specialist

**Alaska Municipal League:** Kathie Wasserman, Executive Director

**Renewable Energy Alaska Project:** Chris Rose, Executive Director

**Alaska Power Association:** Crystal Enkvist, Director of Member & Public Relations

**Energy rater (for Kinai Peninsula, Anchorage, Homer):** Ted Veal

**Cascadia Green Building Council:** Colin Fay, Steering committee

**Anchorage Home Builders Association:** Vicki Portwood, Executive Officer; Paul Michelsohn, member
APPENDIX A: ADDITIONAL RESOURCES

The U.S. Department of Energy 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 www.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. Some of the resources available include:

Resource Guides for Code Officials
- ICC/DOE BECP Resource Guide for Code Officials: a comprehensive and easy to read collection of the best resources available from ICC and DOE.

Energy Code Compliance Training Materials:
- Commercial PowerPoint Training with links to videos
- Residential PowerPoint Training with links to videos
- DOE Guidance for State Compliance Measurement Efforts

Primer on REScheck and COMcheck
- Commercial Compliance
- Residential Compliance

Available Downloads
- Commercial Basic Requirements Download
- Residential Basic Requirements Download

Users Guides
- COMcheck Software Guide
- REScheck Software Guide

Plan Check and Field Inspection
- Commercial Plan Review Quick Reference Guide
- Residential Plan Review Quick Reference Guide
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(X) Not applicable.

Note: The April 1, 2010 Population Estimates base reflects changes to the Census 2010 population from the Boundary and Annexation Survey (BAS) and other geographic program revisions. It does not reflect changes from the Count Question Resolution program. All geographic boundaries for the 2011 population estimates series are defined as of January 1, 2011.
* Sec. 17. AS 44.42 is amended by adding a new section to read:

Sec. 44.42.067. Retrofits and new construction for energy efficiency;

energy efficiency report. (a) Not later than January 1, 2020, the department shall work with other state agencies to retrofit at least 25 percent of all public facilities, starting with those it determines are the least energy efficient, if the department determines that retrofitting the public facilities will result in a net savings in energy costs to the state within 15 years after completion of the retrofits for a public facility and if funding for the retrofits is available.

(b) A retrofit or deferred maintenance of a public facility performed under this section, to the extent feasible, shall meet or exceed the most recently published edition of the ASHRAE/IESNA Standard 90.1, Energy Standard for Buildings Except for Low-Rise Residential Buildings, as published by the American Society of Heating, Refrigerating and Air-Conditioning Engineers.

(c) New construction of a public facility under this section shall meet or exceed the most recently published edition of the ASHRAE/IESNA Standard 90.1, Energy Standard for Buildings Except for Low-Rise Residential Buildings, as published by the American Society of Heating, Refrigerating and Air-Conditioning Engineers.

(d) Not later than January 1 of each year, the department, in consultation with the Department of Administration, shall submit a report to the legislature detailing the department's progress in meeting the requirements of this section to reduce state energy consumption and costs and carrying out the duties listed in AS 44.42.020 as they relate to energy use. The department shall include in the report an analysis of the consumption and expense data recorded by the office of management and budget under AS 37.07.040, comparing energy consumption levels in each year with past 20 years to determine if reductions are being achieved.

(e) In this section, "public facility" means a facility owned and controlled by the state for government or public use that is 10,000 square feet or more and is not a legislative building or court building.

* Sec. 18. AS 44.83.080 is amended by adding a new paragraph to read:

(17) to promote energy conservation, energy efficiency, and alternative energy through training and public education.
REFERENCES

4 Dodge, Katherine. CCHRC. Edits provided in an email to Maria Ellingson on 11/23/2012.
7 Ibid
9 Dodge, Katherine and Dustin Madden. CCHRC. Edits provided in an email to Maria Ellingson on 11/27/2012.
23 Ibid
24 Ibid
25 Ibid