Nevada GapAnalysis

November 2010

BCAP COMPLIANCE PLANNING ASSISTANCE PROGRAM

NEVADA STATE OFFICE OF ENERGY

Prepared by the Building Codes Assistance Project in cooperation with the Nevada Renewable Energy and Energy Efficiency Authority for the United States Department of Energy

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

Building Codes Assistance Project (BCAP)

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

Acknowledgments

We would like to acknowledge the financial support of the Department of Energy, which made this report possible. State officials also collaborated in the production of this report, providing comprehensive background information, local stakeholders contacts, and—perhaps most critically—ongoing review of our work. In particular, we would like to acknowledge the aid of Emily Nunez with the Renewable Energy and Energy Efficiency Authority (REEEA) and Hatice Gecol, formerly with REEEA as well as Dave Nichols, Administrator of the Southwest region of the International Code Council, and Eric Makela, of Pacific Northwest National Laboratory. A number of local code officials also contributed to our efforts to learn about energy code issues at the local level. Among these officials was Christopher Knight of Las Vegas. We also would like to acknowledge a number of code officials and building professionals who provided us with crucial insights and chose to remain anonymous.

Cover image courtesy of Flickr Creative Commons, author Frank Kovalchek.

Table of Contents

Acronyms and Abbreviations

AIA – American Institute of Architects
ARRA/Recovery Act – American Recovery and Reinvestment Act of 2009
ASHRAE – American Society of Heating, Refrigerating, and Air-Conditioning Engineers
BANN – Builders Association of Northern Nevada
BCAP – Building Codes Assistance Project
BPI – Building Performance Institute
CEUs – Continuing education units
DOE – U.S. Department of Energy
ECAP – Energy Code Ambassadors Program
EECBG – Energy Efficiency and Conservation Block Grants
EPA – U.S. Environmental Protection Agency
HERS – Home Energy Rating System
IBC – International Building Code
ICC – International Code Council
IEBC – International Existing Building Code
IECC – International Energy Conservation Code
IFC – International Fire Code
IRC – International Residential Code
LEED – Leadership in Energy and Environmental Design
MEC – Model Energy Code
NAC – Nevada Administrative Code
NACO – Nevada Association of Counties
NAHB – National Association of Home Builders
NCARB – National Council of Architectural Registration Boards
NEC – National Electrical Code
NRS – Nevada Revised Statutes (Current Codified Laws of Nevada)
NSOE – Nevada State Office of Energy
OCEAN – Online Code Environment and Advocacy Network
PNNL – Pacific Northwest National Laboratory
RECA – Responsible Energy Codes Alliance
REEEA – Nevada Renewable Energy and Energy Efficiency Authority
RESNET – Residential Energy Services Network
SEO – State Energy Office
SEP – State Energy Program
SNHBA – Southern Nevada Home Builders Association
SNICC – International Code Council, Southern Nevada Chapter
SWEEP – Southwest Energy Efficiency Project
ULI – Urban Land Institute
UMC – Uniform Mechanical Code
UPC – Uniform Plumbing Code
UNR – University of Nevada, Reno
USGBC – U.S. Green Building Council

Executive Summary

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

The Introduction section provides an overview of relevant state demographics and the impact of the construction boom and subsequent decline. It also covers Nevada's energy portfolio, emphasizing the state's renewable energy and energy efficiency targets, and the potential savings available through energy codes. For instance, full compliance with the 2009 International Energy Conservation Code would yield approximately 7-17 percent savings in residential and commercial energy use while safeguarding the state's valuable energy industries.

The Adoption section takes a close look at the federal, state, and local polices that influence energy codes in the state. This section covers how Nevada's Home Rule status effects the local adoption of the statewide building energy code, the 2006 IECC. It describes the roles of the Renewable Energy and Energy Efficiency Authority (REEEA), as well as other state-level stakeholders, in this process. Moreover, this section calls attention to a number of green initiatives and high performance building programs on the state and local levels. These programs continue to raise the bar for energy-efficient construction practices and help the enforcement, design, and construction industries become accustomed to the requirements of the increasingly stringent model energy codes.

The Adoption section makes four major recommendations, in addition to multiple related recommendations. The core recommendations are:

- Adopt an automatic review and update process for future iterations of the model energy code to lock in future energy savings and remove speculation after the release of each new model energy code.
- Adopt energy codes for state-funded buildings that are more stringent than state energy codes.
- Include building codes as part of its "Energy" Plan.
- Assess and analyze the impact of noncompliance with the energy code, particularly in rural areas of the state.

With most of Nevada's population covered by its statewide building energy code or similar variation, it is critical that the state advance energy code implementation to capitalize on the energy and financial savings available through compliance with the energy code. Beginning on page 27 of the report, the Implementation section covers the many ways in which state and local agencies, the design and construction industries, utilities, and other stakeholders work to promote the adopted energy code, establish efficient, feasible, and cost-effective enforcement and compliance infrastructures, and

adequately prepare code officials and building professionals to carry out their responsibilities. This section describes the state's outreach efforts to local jurisdictions and consumers, particularly through the promotion of the code and educational opportunities by REEEA and other stakeholders. Many of the state's utilities provide incentives and rebates to consumers for energy efficiency improvements, while energy efficiency experts work with local building departments to raise awareness of building science and energy code enforcement issues.

Enforcement and building professionals in Nevada vary in their knowledge of and approach towards energy codes and current Recovery Act requirements. Some inspection departments emphasize strict, consistent enforcement, and most building professionals adhere to or exceed the adopted standards. While energy code implementation is generally strong, some experts cite a need for better energy code infrastructure and practices throughout the state, and a consistent understanding of the forthcoming 90% compliance tracking procedures. Enforcement and building professionals alike have struggled in the wake of the recession and the collapse of the housing market and are supported by building permit fees which have decreased significantly. Additionally, the state requires licensing for design and building professionals, but many of these licenses do not have an energy efficiency or energy code component.

The Implementation section makes many multiple related recommendations, for a variety of different stakeholder groups.

To improve state efforts to support local jurisdictions with energy code implementation, the state could:

- Continue outreach targeted at local involvement in the adoption of the statewide code, and establish itself as the go-to organization for energy code implementation issues.
- Oversee enforcement of the energy code in jurisdictions that do not have sufficient infrastructure.
- Provide assistance for plan review in complex buildings or other specific building types.
- Consider legislation which would form capacity to perform plan review and inspection for areas that lack infrastructure. Or the state could provide a mechanism at the state level to hire 3rd party inspectors to perform plan review and inspection for these underserved areas.
- Continue to provide assistance to local building departments in utilizing DOE PNNL technical resources to the fullest extent.
- Set enforcement standards and criteria at the state level.
- Help to subsidize 3rd party inspections for the energy code, training, and resources.
- Provide materials, resources and services to support energy code compliance.
- Provide both code officials and building professionals' adequate training, especially when the codes and standards change.
- Provide incentives or subsidies for training to promote participation (especially important given the busy schedules of contractors).
- Provide a calendar of events and market training events to affected parties.
- Subsidize attendance to future EduCode conferences with the assurance that the energy code will be included in the curriculum, as resources allow.
- Investigate opportunities for sharing and utilizing regional resources.

- Require that related professional organizations include energy efficiency and codes as part of certification.
- Oversee energy code training that is specific to each professional trade.
- Provide training opportunities for professional trades to obtain and maintain credentials.
- Forge strategic alliances with community colleges especially any that have recently received grants for "green jobs" training to coordinate and encourage (and perhaps provide additional funding for) the inclusion of energy code training.
- Work with AIA to gain their support to promote continuing education courses on energy codes in the short-term.
- Build a relationship with AIA and the National Council of Architectural Registration Boards (NCARB) to get energy code education added as a core requirement to becoming a licensed Architect.
- Add the BCAP energy code calculator on the state's website to help educate visitors: http://bcap-ocean.org/resource/energy-code-calculator.
- Review DOE's guidance on measuring energy code compliance and research the current pilot projects underway in neighboring states.
- Implement a Measurement and Verification (M&V) strategy that allows for long term reevaluation, and accounts for work needed to resolve deficiencies.
- Create an assessment that includes a determination of needs in order to meet 90% compliance with the model energy codes and put a plan in place for reassessment at appropriate intervals throughout the year.
- Advocate for a Systems Benefit Change and collaboration among all communities that received EECBG funding.
- Identify funding sources to support program continuation, this is also a mandatory part of the SEP formula grant program.

The Conclusion section provides a summary of the myriad benefits of energy code adoption and implementation in Nevada and concludes with Table 4, a summary list of the most important recommendations made in the report with page numbers for quick reference. Appendix A offers a list of other DOE and PNNL energy code resources.

Introduction

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

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

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

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

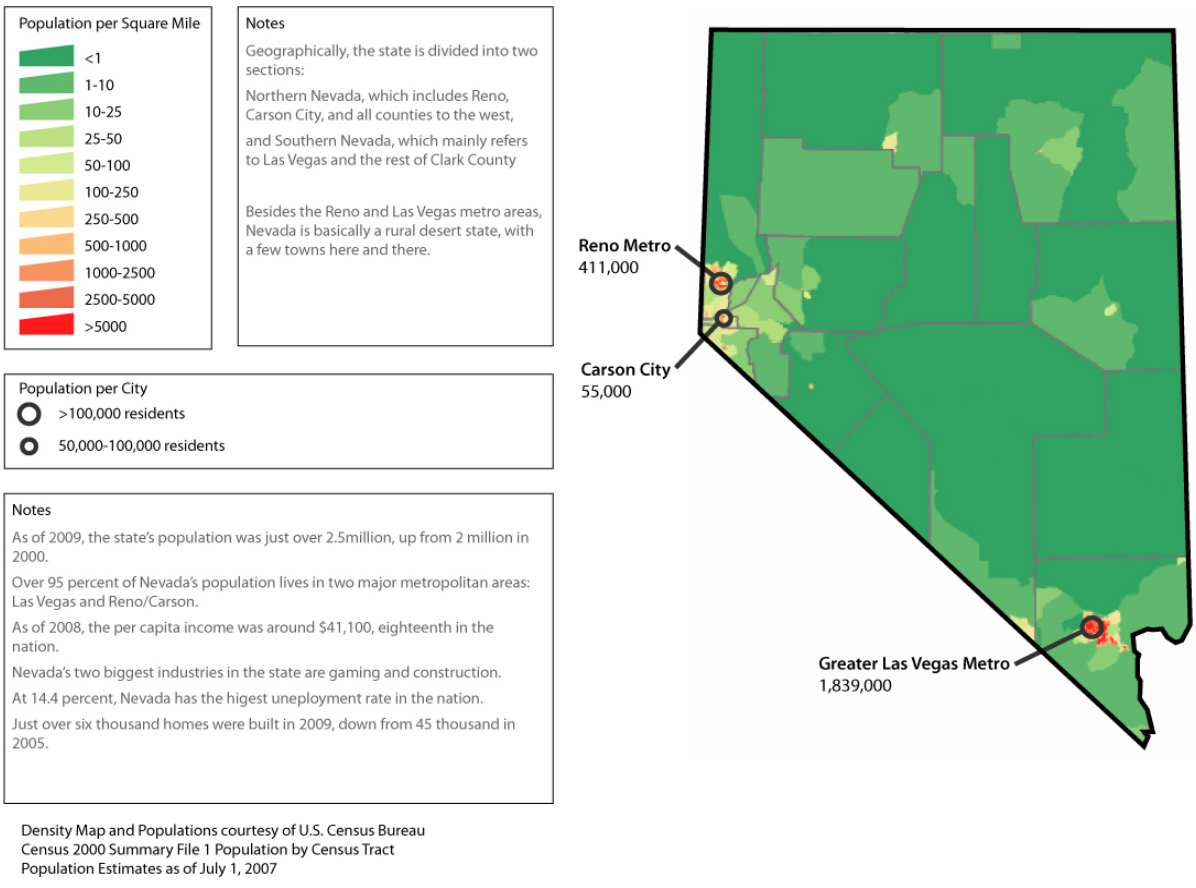
In collaboration with the U.S. Department of Energy, BCAP has undertaken a new program to improve energy code compliance in 15 states, including Nevada, by analyzing the gaps in the existing energy code infrastructure and practices and providing compliance planning assistance and on-the-ground technical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

State Overview

Nevada is a vast desert state made up of mostly rural areas, with three major population centers: Las Vegas in the south and Reno and Carson City in the north. The state's population was just over 2.5 million in 2007, and almost 90% of Nevada's residents lived in these three metropolitan areas. The rest of the state is made up of localized jurisdictions.

The median income in Nevada is 18th in the nation at around $41,200, but currently this statistic is not a good indicator of the state's economy. In August 2010, Nevada passed Michigan's unemployment rate for highest in the nation at 14.4%.[2] Nevada's two major industries are gaming and construction, both of which have suffered considerably in the current economic conditions. In addition, Nevada does not collect a state income tax, and in the past has made up for this in taxes on income from gaming revenues, gaming devices, rooms and entertainment. The leisure and hospitality industry also generates substantial tax revenue through sales taxes on restaurant food and on liquor. As a result, state government will have to make significant budget reductions, and will likely depend on federal grants to stimulate the economy.

Figure 1, State Population Map



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

One major barrier to code implementation in the state is the resistance from within jurisdictions to the code. For example, Nevada is not a home rule state[1], but according to Eric Makela of the Pacific Northwest National Laboratory (PNNL), and long time trainer for the state of Nevada, localities within Nevada have a similar attitude of disinterest in compliance with a statewide mandate. Furthermore, opponents of the code argue that the cost of building a house to updated energy codes will make those homes unaffordable. In a state so distraught by the economic recession and slowed construction, this is a valid argument.

Additionally, many town and county officials are unaware of NRS 701.220, the statewide law that requires the Energy Commissioner to develop regulations that make mandatory the adoption of the 2009 IECC and subsequent codes every third year thereafter by all jurisdictions statewide. Many of the rural towns and counties in Nevada do not have a building department to enforce any code, and some that have building departments do not communicate regularly with the state.

Construction Overview

Construction is a very important industry to Nevada; it is one of the two largest providers of jobs in the state. Historically speaking, both residential and commercial construction in the state has been very high, due to the population growth in the state and gaming/tourism to Nevada's major cities. In 2005, over 45,000 residential units were permitted for construction,[3] a considerably high number given Nevada's population of only around 2.5 million. However, as Figure 2 indicates, by 2009 that number had dropped to around 6,000 units.

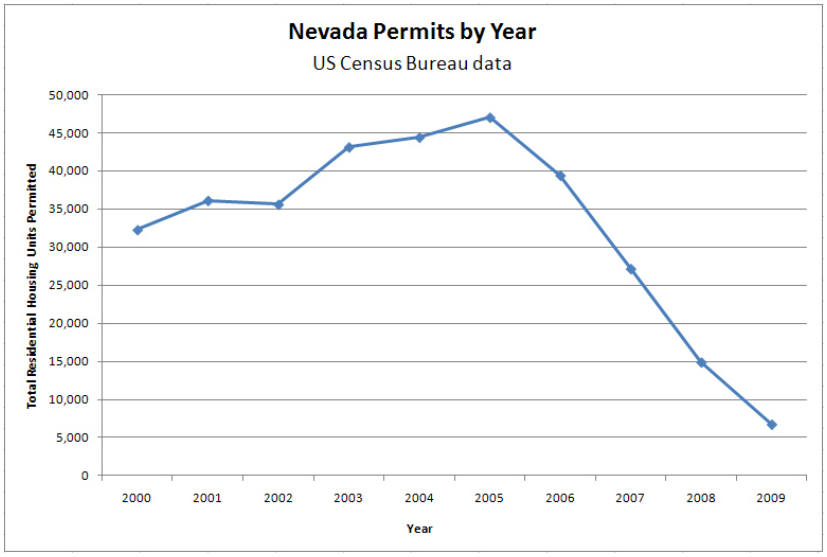


Figure 2, Single Family Construction Permits by Year, 2000-2009

The commercial construction outlook is not promising either. According to the Urban Land Institute's (ULI) Emerging Trends in 2011 report, Las Vegas has modestly poor to very poor prospects for investment and development.[4] ULI did not provide an outlook for any other cities in Nevada.

Even though this slow down in construction is not good for the economy, it presents a unique opportunity for the advancement of energy codes in the state. While homebuilders, contractors, and

[1] Home rule in this context defined as the ability of a local government to act and make policy in all areas that have not been designated to be of statewide interest.

code officials are spending less time in the construction process, they now have more time to spend learning how to comply with the new energy codes and why they are so important. The State of Nevada and its local jurisdictions can take advantage of Recovery Act stimulus funding currently available to implement the code and conduct training. This is an advantageous time to implement building codes, as reduced construction will help transition all stakeholders into the new code, rather than trying to force it while construction is high. Finally, builders will be looking for a competitive edge to keep demand for their homes high, and offering consumers homes with lower energy bills and lessened environmental impacts is always a plus.

Energy Portfolio

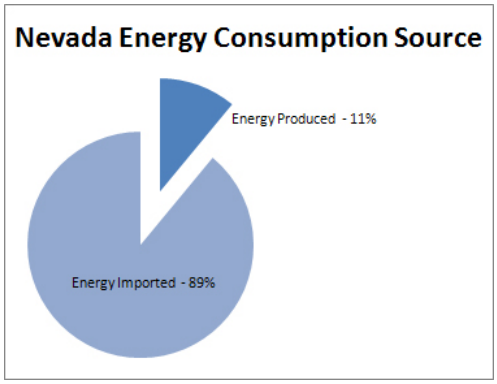


Figure 3, Energy Production vs. Importation, 2008

Nevada relies heavily on energy imported from other states; as figure 3 shows, Nevada generated only about 11% of the energy it consumed in 2008. The state's primary source of energy is petroleum (42%), followed by natural gas (34%), and coal (11%).[5] While Nevada is quite dependent on conventional sources of energy, the state has a very broad renewables portfolio. Hoover Dam, outside Las Vegas, is still one of the largest hydroelectric plants in the country. Additionally, the state has a very high potential for solar and geothermal generation and has already begun taking advantage of it: in 2010 Nevada became the top ranked state for installed solar capacity per capita.[6] Nevada has a 2009 renewable portfolio standard that 25% of the state's electricity comes from renewable sources in 2025 and 6% from solar in 2016.[7]

Residential energy costs in Nevada are slightly above the national average, at 12.42 cents/kWh.[8] Energy consumption per capita is 40th nationwide.[9] Future compliance with energy codes such as the 2009 International Energy Conservation Code (IECC) will significantly reduce energy consumption, lessen the impact on the grid, save consumers money, and help secure Nevada's energy for the future.

Reducing overall energy use through the adoption and implementation of the model energy codes would allow the state to phase out energy production from fossil fuels in favor of renewable energy, rather than having to add both in the short and medium-term to meet growing demand. Nevada Energy Commissioner Stacey Crawley believes that energy efficiency can reduce the state's total demand by 25%. In the long-term, it would also allow the state to achieve its goals for greenhouse gas emissions reduction more quickly.

Potential Savings from Energy Codes

When compared to the current practice of building to the 2006 IECC, building a new home in Nevada to the 2009 IECC will cost an additional $777.15, on average. However, consumers living in this home will save an average of $228.50 per year in energy costs, bringing the simple payback period to around 3

years and 5 months.[10] Given the 11-12 year average most consumers live in a home, purchasing, selling, and living in a house that is built to the 2009 IECC in Nevada could be considered a sound investment.

Adoption

Federal Policy

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

EPAct

The Energy Policy Act (EPAct) of 1992 required DOE to determine whether the most current model energy codes would improve energy efficiency for residential and commercial buildings. It also mandated that the DOE make a new determination within twelve months for every subsequent revision of these codes. Each state would then have two years to certify that it had revised its own energy code to meet or exceed the requirements of the latest iteration of the national models. A state could decline to adopt a residential energy code by submitting a statement to the Secretary of the DOE detailing its reasons for doing so. The Energy Policy Act of 2005 specified that the most current model energy codes were the 2004 supplement to the 2003 IECC and ASHRAE Standard 90.1-2004.[11]

What's required by the IECC?

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

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

Since the 2006 IECC is adopted by most jurisdictions in Nevada, the Governor submitted a letter to the Secretary of the DOE requesting an extension to adopt the latest version of the code, and the rulemaking process to adopt the 2009 code is now underway, Nevada is in compliance with EPAct.

The Recovery Act

In 2009, Congress passed the Recovery Act, which provided states with stimulus funds through the State Energy Program (SEP) and the Energy Efficiency and Conservation Block Grants (EECBG) to adopt the 2009 IECC or equivalent for residential construction and the ASHRAE Standard 90.1-2007 or equivalent for commercial construction, as well as achieve 90 percent compliance with the codes by 2017.[12] As a stipulation for receiving SEP funds, Governor Jim Gibbons wrote a letter to DOE assuring that state officials would begin actions to achieve these goals. Based on the governor's assurance and the State Energy Plan submitted by Nevada State Office of Energy (NSOE), DOE awarded $34.7 million in SEP funds to Nevada for energy efficiency and renewable energy programs.[13] DOE also approved the NSOE EECBG program plan and awarded cities and counties over $5.8 million in formula block grants, to be used for energy efficiency and conservation projects.[14]

State Policy and Energy Code Adoption

In the United States, building energy codes are adopted on the state and local levels. This is due, in part, to the diverse range of cultures and climates found across the fifty states, as well as a host of historical political influences that shaped federal-state and state-local relations. The process differs from state to state, but in most cases codes are adopted through a legislative process, a regulatory process, or a combination of both, although a handful of states are strongly home rule and permit local jurisdictions to adopt energy codes. Every state is unique in how it conducts business and creates policy, and each state requires its own particular strategy for achieving the best possible code for its local governments, citizens, and businesses.

In May 22, 2009, Gov. Jim Gibbons signed into law legislations SB 73 and SB 358, which revises the process of updating the state's building energy codes by establishing the standards adopted by the NSOE as the minimum standards for building energy efficiency and conservation. The law requires local governments to adopt and enforce these codes and any future codes established by REEEA. The law also mandated that the REEEA update the code every three years, and hold at least three public hearings during its development. Following the passage of SB 73 and SB 358, the 2006 IECC has become the minimum code adopted by most local jurisdictions. However, the state had not yet officially adopted the 2006 code and had no way of holding local jurisdictions accountable for its adoption. Nevada's Legislature has since passed the responsibility of energy code development from the State Office of Energy to the newly created Renewable Energy and Energy Efficiency Authority (REEEA). As of the completion of this report, Governor Brian Sandoval has proposed consolidating the REEEA with the NSOE and appointed a new Energy Commissioner as of February 16, 2011.

Local energy code adoption in Nevada can be separated into two categories: Northern Nevada, which includes the Reno/Carson City Metropolitan area and most of the vast rural counties to the east, and Southern Nevada, which mostly refers to greater Las Vegas, and Clark and Nye Counties.

According to our sources most cities and jurisdictions in Northern Nevada have formed a steering committee, and almost all of them adopt code updates together. These jurisdictions have traditionally

been slightly resistant to adopting the most recent building energy codes as required by state-level energy offices, seeing it as an unfunded mandate. Nonetheless, most of Northern Nevada eventually adopted and currently enforces the 2006 IECC, including all of the major population centers in the area. According to one code official in Carson City they will skip the 2009 ICC code cycle and adopt the 2012 suite of codes at a later time due to economic restrictions. However, as the adoption process of the 2009 IECC has gained momentum in the state, it appears that the mindset has shifted in Northern Nevada and that the region will in fact adopt the code when it becomes mandatory statewide.

Similar to Northern Nevada, jurisdictions in Southern Nevada adopt an energy code as a committee as well. However, due to an increased green building infrastructure, cooperation from homebuilders, and the increased benefits of efficiency due to extreme climates, Southern Nevada has been proactive about keeping their code up-to-date. Currently, all jurisdictions in Clark County (the most populated area of the state) have adopted the 2006 IECC with minor amendments for climate. However, the county and all jurisdictions including Las Vegas have adopted the 2009 IECC, which will be effective July 1, 2011, even if the regulations to adopt the code are not finalized.

Recent Energy Codes-related Legislation

In response to the former Governors' assurance that the state would adopt the 2009 IECC and achieve 90% compliance by 2017, the state is ready to proceed with the rulemaking process as required pursuant to NRS 701.220 to adopt the most current version of the code. Current Nevada Governor Brian Sandoval believes that this effort is important and should continue as scheduled, exempting its process from a statewide executive order to halt the adoption of new regulations. Once adopted into state law, this standard will require its adoption and enforcement by all local jurisdictions in Nevada. REEEA is currently holding stakeholder meetings on the 2009 IECC, after which the energy commissioner will begin the rulemaking process and hold public workshops and regulation hearings to finalize the required statewide code. REEEA's first Notice of Request for Comments and Proposed Regulations can be found on its web site.[15] Stakeholders are invited to submit written comments using the form also located at the REEEA web site. In an effort to assist all regions, REEEA will accept comments via U.S. Postal mail, Facsimile, or via electronic mail.

Once the regulations are drafted, the Energy Commissioner will hold three regulation hearings before finalizing the required statewide code. The new regulations will be adopted under Nevada Administrative Code (NAC). However, some stakeholders in rural regions in the state are unaware of the development of the regulations or are unresponsive towards the development of the new code. This is significant because once passed, compliance with the code will be contingent on awareness of the law and its specific requirements, especially in rural areas, as well as their attitude that its development was collaborative statewide.

Although the 2009 IECC was published in March 2010, the Nevada update process did not start until more than six months later when ARRA funding gave the state the opportunity to start the process; REEEA was started in October 2009, but funding for REEEA to start the code adoption process was not

available until June 2010. The adoption will be completed within two years which is very close to or past the publication of the 2012 version of the IECC.

> **Gap:** The state does not have an automatic energy code review and update process on a three-year cycle. Current rules required by the state legislature cause the update cycle to be on a two year delay compared to the IECC publication process.
>
> **Recommendation #1:** The state should adopt an automatic review and update process for future iterations of the model energy code.

REEEA is currently holding stakeholder meetings for climate zone 3 in southern Nevada, and climate zone 5 in northern Nevada. The purpose of these meetings is to provide building jurisdiction, building professional and other interested parties an opportunity to work with REEEA to develop the process for meeting 90% compliance to the 2009 International Energy Conservation Code (IECC) by 2017.

> **Gap:** Some stakeholders in rural regions in the state are unaware of the development of NRS 701.220 or are indifferent towards the development of the new code.
>
> **Recommendation #2:** As resources allow, the state could take extra measures for outreach to rural areas of the state. (see Outreach section)

Other Nevada Building Codes

The agency that is in charge of capital project improvements for state buildings is the State Public Works Board. The State Public Works Board has adopted the following codes as mandatory for all state-funded buildings:[16]

- 2006 International Building Code (IBC)
- 2006 Uniform Mechanical Code (UMC)
- 2006 Uniform Plumbing Code (UPC)
- 2005 National Electrical Code (NEC)
- 2006 International Fire Code (IFC)
- 2006 International Energy Conservation Code (IECC)
- 2006 International Existing Building Code (IEBC)
- 2006 International Residential Code (IRC)

On the local level, building codes are adopted separate from the state. However, most of the major jurisdictions in Northern and Southern Nevada have adopted the 2006 Suite of the ICC codes as mandatory for all public and private construction.

Energy Codes for State-funded Facilities

According to the USGBC, on June 8, 2009, Governor Gibbons signed into law SB 395,[17] containing a provision that requires the State Public Works Board to adopt standards and performance guidelines concerning the efficient use of water and energy for state-owned and operated buildings. Effective July

1, 2009, this provision amends Chapter 341 of NRS. The State Public Works Board may consider standards as set forth in LEED, Green Globes, Energy Star, ASHRAE, FEMP, and IECC.

Gap: Nevada has not adopted a modern energy code for state funded buildings, nor one that "pushes the market" by leading by example.

Recommendation #3: As resources allow, the state should adopt energy codes for public-funded buildings that are more stringent than state energy codes. By requiring a more stringent energy code for public-funded buildings, the state demonstrates fiscal responsibility with tax payer dollars. In addition, more stringent requirements familiarize and train the construction industry and code enforcement officials, and increase demand for "greener" products from product suppliers, manufacturers and service providers. More efficient public buildings also help governments hedge against uncertain future energy costs and availability, and reduce a government's susceptibility to fuel price volatility while creating jobs and stimulating the local economy.

Statewide Climate Change Initiatives

Nevada currently has a Comprehensive State Energy Plan per NRS 701.190, and a State Energy Conservation Plan per NRS 701.215, both of which are under revision. Additionally, in 2007 Governor Jim Gibbons issued an Executive Order to establish an Advisory Board Committee on Climate Change. This committee published a 2008 Climate Change Report[18] which made a large number of recommendations to reduce emissions through energy efficiency across all sectors, including building energy codes. The report does not suggest Nevada adopt any particular energy code; rather modify existing codes to enforce that all new construction and major renovations meet specific energy consumption goals. The report sets a prestigious goal of a reduction in energy generated from fossil fuels per square foot be 50% below the national average in 2010, and work its way up to net-zero energy buildings by 2030.

Why Climate Change Initiatives Matter

Nevada is concerned with the potential impacts of climate change on the environment and the economy. Since building energy use accounts for roughly 40 percent of energy use in the nation—and in Nevada, much of that energy comes from non-renewable sources—energy codes are a vital tool for reducing energy use and, thus, greenhouse gas emissions, not to mention saving money.

Energy savings built into new construction will accrue over the life of the building. Considering that buildings typically last from 50-100 years, adopting energy codes not only impacts new building energy performance, but also the energy performance of existing buildings until 2060 and beyond. This makes energy codes an important long-term policy for mitigating climate change and supporting Nevada's economy.

Gap: The state does not have one over-riding climate change or energy policy that could help support energy codes as one piece of a larger statewide effort.

Recommendation #4: Nevada should consider incorporating building energy codes into its Energy Conservation Plan currently under development. This will link energy codes as one

policy that can support related policies (e.g., energy efficiency can help make the RPS goals easier to achieve; energy efficiency can help reduce emissions in EPA non-attainment areas; support of energy codes can help achieve EERS goals).

Overview of Green and Above-Code Programs

Energy efficient construction also brings down the cost of renewable energy options for homeowners and operators of commercial buildings. For residential buildings, when homes are equipped with energy-efficiency measures, the overall energy demands of the home decrease, which means homeowners can reduce the size of solar PV and solar hot water equipment on their rooftops. By buying smaller-scale equipment, costs are lowered for homeowners—potentially resulting in increased market penetration for these technologies and lower cost by way of economies of scale for manufacturers. The same principle applies to the provision of on-site energy for commercial buildings. Taken as a whole, renewable energy production at the building level also compliments utilities' efforts to meet the renewable portfolio standard goals adopted by many states.

Why Green and Above-Code Programs Matter

Green and advanced codes and standards help to transform the marketplace by bringing high performing buildings into the mainstream. They also raise awareness of energy- and resource-efficient design for the public, as well as design and building professionals and code officials. Finally, they raise the ceiling for building energy performance, which, in turn, accelerates and shapes the development and adoption of future model codes.

Leadership in Energy and Environmental Design

On June 15, 2007, Governor Jim Gibbons signed into law AB621,[19] which provides state-level tax incentives for green buildings. The law creates the potential for lower property taxes for commercial buildings and high-rise residential buildings that meet LEED-Silver certification, as well as exempts the owner of the building from taxes on the value added from energy-efficient materials. While AB621 is a good start to encouraging LEED certified buildings, LEED has been slow to take hold in the state. To date, only 42 buildings in Nevada are LEED certified with another 156 currently in the LEED application process. These numbers are comparable to neighbors Utah, New Mexico, and Wyoming, but well below totals in Arizona, Colorado, and the national average.[20] Nevada currently has over 1,000 LEED Accredited Professionals (AP) and Green Associates (GA), most of which are located in the Greater Las Vegas metro area.[21]

Passed in June 2005, Nevada AB3 provides incentives to private construction in addition to the requirements that state-funded buildings meet LEED certification. Property owners of non-residential buildings could receive a tax abatement of 25-35%, depending on the level of LEED accreditation earned by the building. This resulted in $900 million in lost tax revenue, and the June 2007 passage of AB621 reduced the amount in tax abatements a property owner could earn.

ENERGY STAR

The EPA ENERGY STAR for Homes program has had much more market penetration than LEED. Since the ENERGY STAR program began, nearly 85,000 qualified homes have been built in the state.[22] While Nevada's population accounts for less than 1% of the total U.S. population,[23] ENERGY STAR homes in Nevada make up 7.6% of the qualified homes in the United States, with an incredible 63% market

penetration. This success can be attributed to the awareness of consumers in Nevada's harsh desert climate of the benefits of energy efficiency, as well as cooperation and participation from homebuilders. There are 44 registered ENERGY STAR homebuilders in Nevada, although only 6 have joined since 2008. Additionally, there are 13 HERS Raters in the state.

In addition to ENERGY STAR, Nevada's electric utility, NV Energy, promotes Energy Plus Homes, which must receive an even better score from a HERS rater than the ENERGY STAR requirement. These homes can save twice as much energy as ENERGY STAR, and are offered by some homebuilders in Nevada. NV Energy also offers a number of rebates for home energy efficiency improvements, including rebates on new air-conditioning units and pool pumps in Southern Nevada and on heating units in Northern Nevada.

Building America

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

The HERS Index Explained

The HERS Index is a scoring system that provides a scale for measuring the energy efficiency of a new home compared to a reference home that was built to the 2004 IECC, which is assigned the score of 100 points. The lower a home's HERS Index, the more energy efficient it is. Every one point decrease in the HERS Index corresponds to a one percent reduction in energy consumption compared to the HERS reference home. For example, a home that scores an 85 is 15 percent more efficient than the HERS reference home, and a home that scores zero is a net zero building (see www.resnet.us for more details). Both ENERGY STAR for Homes and Building America intend to increase the stringency of their requirements in the coming months.

Through its Builders Challenge program, new homes that meet stringent qualifications can earn an EnergySmart Home Scale label. Builders Challenge is similar to ENERGY STAR for Homes in that both programs assist and reward builders who build homes more efficiently than standard practice. However, the energy threshold requirements for the Builders Challenge program are different than those of ENERGY STAR.

According to their website, builders in Nevada have built thousands homes to Building America specifications, and even more are planned. It is possible that both of these numbers are higher, given that the website lacked information on a number of projects and efforts to learn more were unsuccessful.[24]

Local Policy

Local energy code adoption varies greatly from state-to-state. In strong home rule states, local jurisdictions have full authority to adopt energy codes that best fit the needs of their community, while others must meet a statewide minimum first. On the other end, some states mandate a minimum-maximum energy code that prohibits local jurisdictions from diverging from the state code whatsoever. Most states fall somewhere in between, mandating a minimum code, but allowing some flexibility to go beyond it in progressive jurisdictions.

IECC and Standard 90.1

The 2006 IECC is adopted on the state level in Nevada, and all jurisdictions are expected to adopt the code themselves. Although the state has not been very strict about holding the jurisdictions accountable, adoption of the IECC in Nevada has not been a major problem, around 95% of the state's population is covered by an energy code.

Jurisdictions in Southern Nevada, which have historically had a great deal of cooperation from homebuilders on code adoption, have already adopted the 2009 IECC and will enforce the code beginning July 1, 2011. According to SWEEP, Northern Nevada's jurisdictions are not as well organized; some adopted the 2006 IECC just recently, and according to ICC (see Figure 4) some rural jurisdictions have yet to adopt the IECC.

IBC or IRC

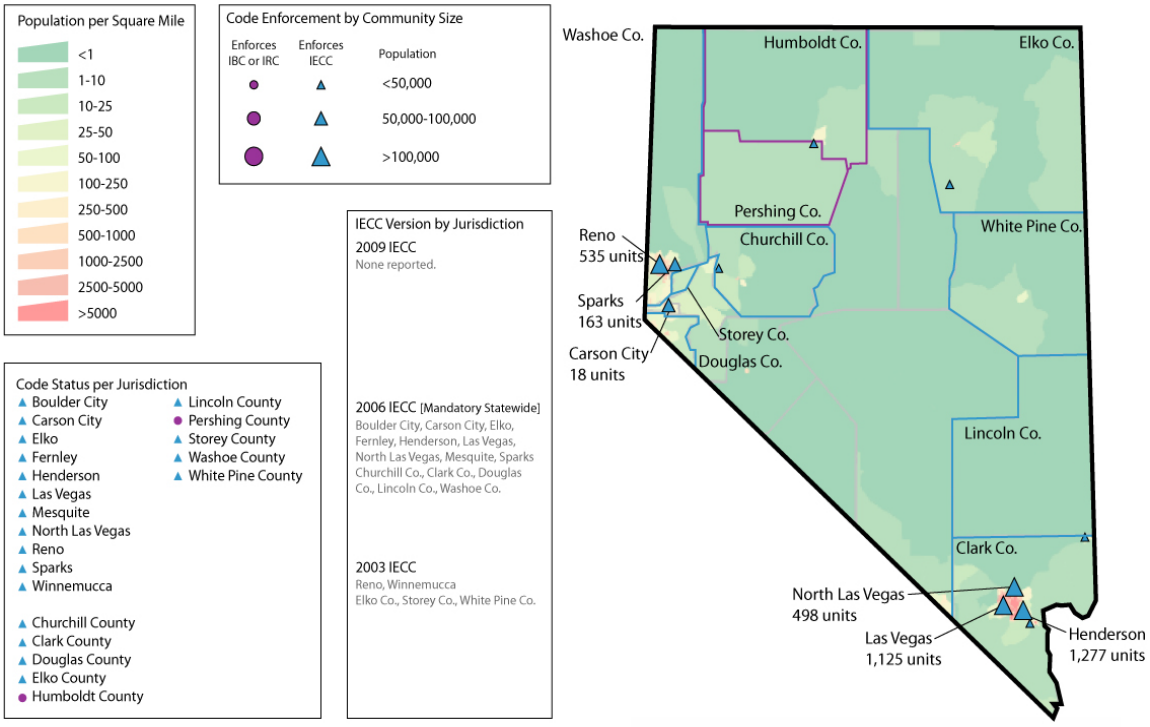
Several communities within Nevada choose to adopt the International Building Code (IBC), which covers commercial construction. The IBC's Chapter 13 references the IECC—which, in turn, references ASHRAE Standard 90.1-2007 as an alternative compliance path—but does not reproduce it. In theory, then, the IBC is equivalent to the IECC and Standard 90.1, but only if the jurisdiction also adopts the IECC. The municipalities in Nevada that adopt the IBC eliminate Chapter 13 altogether or choose not to also adopt the IECC, as well. Therefore, in practice, adopting the IBC is not equivalent to adopting the IECC.

IECC vs. IRC

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

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

Figure 4, Energy Code Status by Jurisdiction



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

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

As Figure 4 shows, there are very few jurisdictions that have not yet adopted any version of the IECC, and these rural areas make up only a very small percentage of the state's population and construction. Some jurisdictions in Northern Nevada allow for the use of Chapter 11 of the IRC in lieu of the IECC to show compliance with the mandatory energy provisions.

Gap: Rural areas are slow to adopt an energy code.

Recommendation #5: An assessment should be made that analyzes the impact of noncompliance on these areas and the cost of state outreach specific to rural areas.

Local Climate Change Initiatives

Five cities in Nevada (Henderson, Las Vegas, Mesquite, Reno, and Sparks) have signed onto the U.S. Conference of Mayors' Climate Protection Agreement.[25] Signing this agreement signals an agreement to enact policies and programs that meet or exceed a greenhouse gas emissions reduction target of seven percent below their 1990 levels by 2012.

Additionally, Clark County, Henderson, Las Vegas, North Las Vegas and Washoe County are all members of the international association Local Governments for Sustainability (ICLEI).[26] ICLEI, which has over 1,100 members in 68 countries, is a collaboration of local governments who have made a commitment to sustainable development. ICLEI provides technical consulting, training, and information services to build capacity, share knowledge, and support local government in the implementation of sustainable development at the local level. Their basic premise is that locally designed initiatives can provide an effective and cost-efficient way to achieve local, national, and global sustainability objectives.

Overview of Local Green and Above-Code Building Programs

A number of cities in Nevada encourage or require green building construction through the incorporation of LEED certification into codes and incentives:[27]

LEED Statistics in Nevada by Major City

City	Certified Projects	Registered Projects	LEED APs/GAs
Carson City	0	2	6
Henderson	7	11	109
Las Vegas	23	96	653
N. Las Vegas	3	3	14
Reno	7	18	182
Sparks	1	4	30
Entire State	42	155	1,035

Carson City

The Municipal Code of Carson City, Title 18,[28] Section 6.6.4 requires that all new construction meet basic LEED certification criteria and submit a LEED scorecard as part of the design review. This applies to all new residential, commercial, and mixed-construction in the jurisdiction.

Henderson

In order to comply with the prescriptive Henderson Development Code,[29] a building must earn 30-54 points depending on the type. Page 440 of the code states that among other sustainable building practices, earning LEED Silver, Gold, and Platinum certification will award 2, 3, or 5 points, respectively.

Las Vegas

New homes in Las Vegas that pursue LEED for Homes or another green home certification, new commercial buildings pursuing LEED for New Construction, Core and Shell, Commercial Interiors, or Neighborhood Development, and existing commercial buildings pursuing LEED for Existing Buildings are eligible for city-level incentives. These building owners can receive $500-$1,000 in fee reductions for plan reviews and LEED certification, and commercial buildings can receive anywhere from $200-$10,000 in rebates for meeting specific LEED standards.[30]

North Las Vegas

The Municipal Code of North Las Vegas[31] Title 17, Section 17.24.225 incentivizes LEED certification by offering one point out of 5.5-8 points, depending on construction type, toward a density bonus for the building.

Reno
Reno Municipal Code, Article III, Section 18.08.301[32] encourages non-residential construction to include meeting LEED certification as part of general design standards.

Adoption Summary

Current Best Practices

Nevada sets a best practice example in that it adopts and regularly updates its residential and commercial building energy codes (and is in the process of adopting the 2009 International Energy Conservation Code and ASHRAE Standard 90.1-2007) and that the update of the state energy code is accomplished through a regulatory process. During this process the state gathers and assesses views and interests of the building community. In addition, the state reviews and considers model legislative or regulatory rulemaking language and adapts that as needed.

The state has created a REEEA, assigned to adopting and/or updating the energy code. The interests of all affected groups are considered by REEEA in their public comment process. There is a balance of interests for builders, designers, industry and environmental groups that are made aware of the public comment process and the planned changes to the state code. There is more than one public comment period. REEEA adheres to a regular schedule and assures regular updates to the state code as dictated by state law.

Nevada is exemplary in promoting programs to lead the market forward on energy efficiency and high performance buildings. The state has well established advanced building programs such as Energy Star. The state promotes the use of advanced building standards such as LEED and participates in the development of advanced codes such as the Southern NV Energy Code Amendments which precede the statewide update of the energy code.

Gaps and Recommendations

As mentioned above, addressing the following gaps in energy code adoption will help streamline the process in Nevada and increase support for the code among all stakeholders.

> **Gap:** The state does not have an automatic energy code review and update process on a three-year cycle. Current rules required by the state legislature cause the update cycle to be on a two year delay compared to the IECC publication process.
>
> **Recommendation #1:** The state should adopt an automatic review and update process for future iterations of the model energy code.

Gap: Some stakeholders in rural regions in the state are unaware of the development of NRS 701.220 or are indifferent towards the development of the new code.

Recommendation #2: As resources allow, the state could take extra measures for outreach to rural areas of the state. (see Outreach section)

Gap: Nevada has not adopted a modern energy code for state funded buildings, nor one that "pushes the market" by leading by example.

Recommendation #3: As resources allow, the state should adopt energy codes for public-funded buildings that are more stringent than state energy codes. By requiring a more stringent energy code for public-funded buildings, the state demonstrates fiscal responsibility with tax payer dollars. In addition, more stringent requirements familiarize and train the construction industry and code enforcement officials, and increase demand for "greener" products from product suppliers, manufacturers and service providers. More efficient public buildings also help governments hedge against uncertain future energy costs and availability, and reduce a government's susceptibility to fuel price volatility while creating jobs and stimulating the local economy.

Gap: The state does not have one over-riding climate change or energy policy that could help support energy codes as one piece of a larger statewide effort.

Recommendation #4: Nevada should consider incorporating building energy codes into its Energy Conservation Plan currently under development. This will link energy codes as one policy that can support related policies (e.g., energy efficiency can help make the RPS goals easier to achieve; energy efficiency can help reduce emissions in EPA non-attainment areas; support of energy codes can help achieve EERS goals).

Gap: Rural areas are slow to adopt an energy code.

Recommendation #5: An assessment should be made that analyzes the impact of noncompliance on these areas and the cost of state outreach specific to rural areas.

Implementation

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

Overview of State and Local Implementation Policies

Currently Nevada's statewide building energy code does not set enforcement standards and criteria, and as a result there is no statewide adoption of a code among jurisdictions. In many cases a city code may differ from a county code, which may differ from the state code. Since the responsibility of enforcement falls in the hands of local jurisdictions, code compliance differs throughout. Communication has sometimes been difficult between state-run departments and rural communities, and as a result many of these communities do not know how to implement the code properly. Because each jurisdiction has a different implementation structure, enforcement can be inconsistent and compliance difficult to track.

The goal of NRS 701.220 is to adopt the most recent version of the IECC as mandatory statewide as a minimum standard. Although enforcement is also mandatory it will be accomplished at the local level on a jurisdiction by jurisdiction basis.

Outreach

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

State's Role in Promoting Codes

The 2006 IECC was passed as mandatory in May 2009 as a result of SB 73[33] and SB 358.[34] Recently, REEEA has become the point organization responsible for the adoption and implementation of the 2009 IECC, and has worked very hard with support from NSOE to reach out to building departments and other stakeholders throughout the state, informing them of the upcoming code changes and meetings. As one might expect, communication with Nevada's rural areas can be difficult at times, and additional

resources for travel and outreach to these areas would make a huge difference in getting the word out throughout the state. This, in turn, will generate increased stakeholder participation in stakeholder meetings and code hearings, which will keep all of the Nevada's jurisdictions motivated to adopt and enforce the 2009 IECC when it is finalized as the statewide code.

> **Gap:** Because REEEA is a newly formed agency, some areas of the state are unaware of state activities.
>
> **Recommendation #6:** As resources allow, REEEA should continue outreach targeted at local involvement in the adoption of the statewide code, and establish itself as the go-to organization for energy code implementation issues.

Local Government's Role in Promoting Codes

According to Eric Makela many jurisdictions expressed interest in more implementation efforts from the state, even if it means being held accountable for adopting the new energy code as mandatory. This, as they say, will put more pressure on the local policy makers to get the code passed by the cities. This, in turn, would reduce the work necessary to pass the code at the local level.

Because support and awareness of high performance and green building is so prevalent in the Las Vegas area, Southern Nevada has had the resources necessary to play an active role in local code promotion, and the results have been excellent. Stakeholders in Southern Nevada appear to be very aware of the current energy code, as well as the date of implementation for the 2009 IECC. *Sustaining Las Vegas*, the green building initiative for the city, also helps to promote the most recent energy codes.

Northern Nevada does not have the same green building influence and support infrastructure that is seen in the south. SWEEP, the regional energy-efficiency advocacy group, characterizes the region as more "singularly focused" and as in all areas of the country, energy issues are not as important as health, life, and safety codes.

Enforcement Community

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

Overview of Enforcement Infrastructure

Communication is currently increasing between the state of Nevada and local jurisdictions with respect to energy code implementation and a new infusion of funding for codes will help to strengthen code implementation. Nevada's major communities both in the north and south adopt building energy codes

together, which allows the enforcement infrastructure within the two parts of the states to remain relatively organized and consistent. Each jurisdiction's inspection department is made up of plan reviewers, on-site code inspectors, and in some cases, permit tech experts.

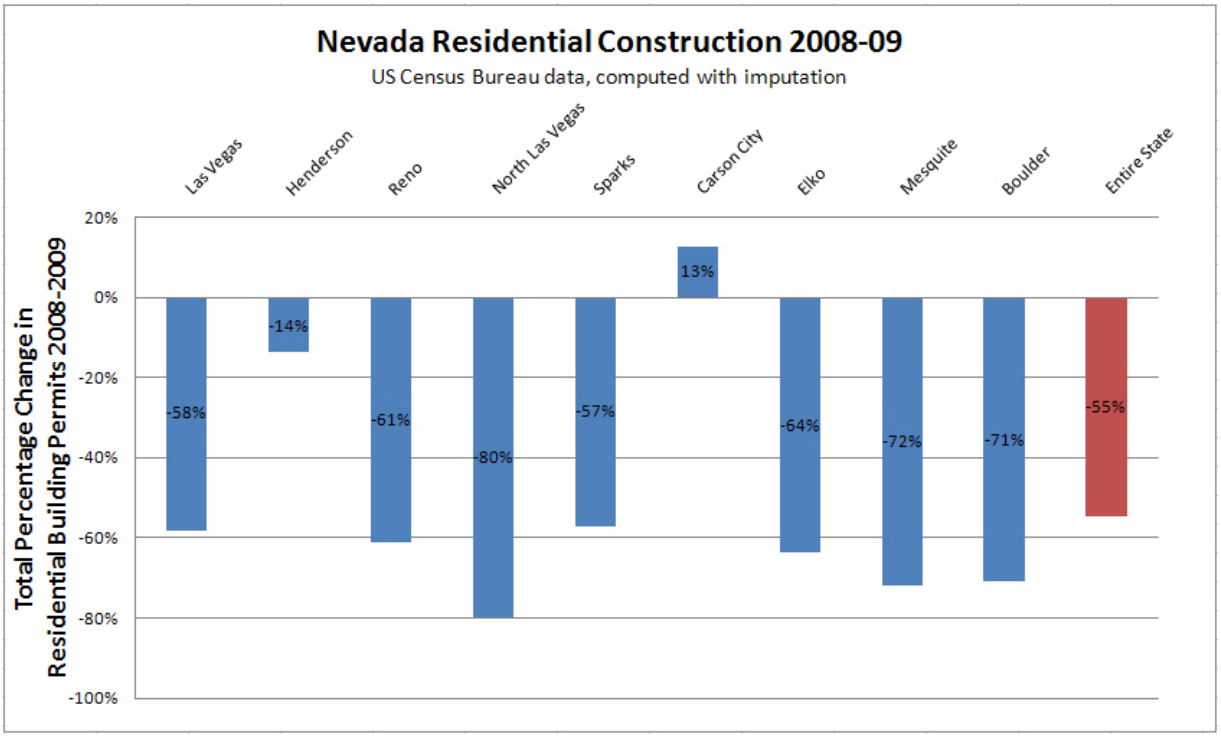
On the state level, the Nevada Public Works Board is responsible for overseeing all publicly-funded construction, including plan review and site inspection. According to the Public Works Board, they take suggestions from the NSOE, but it is ultimately responsible for administering and enforcing the energy code at the state building construction level. On the local level, the responsibility of code enforcement lies with the building department of each incorporated city, and construction in all unincorporated areas are governed by the building department at the county level. Generally speaking however, enforcement remains consistent between a city and its respective county.

In Southern Nevada, energy code enforcement has been especially organized and consistent. Much of this can be attributed to the ENERGY STAR program, which in the past decade has seen a huge push from area homebuilders. Once consumers became aware of the benefits of energy efficiency, demand for ENERGY STAR continued to grow, and the program has had an incredible market penetration. As a result, the area has seen ENERGY STAR RESNET home energy raters who inspect for above-code compliance, making enforcement of the baseline energy code much easier.

Energy code enforcement in Northern Nevada is not quite as organized and effective. There is not as much of an influx of green or high performance homes in the area, which puts the region at a disadvantage when compared to its southern counterpart. Jurisdictions in Northern Nevada reported having adopted the 2006 IECC much later than Southern Nevada.

Enforcement in rural communities is less common than in cities. It is difficult for these communities to stay up-to-date on the current code, as well as resources and training available to assist in its implementation. In addition, these rural areas' already small code enforcement departments have been left with decreased funding due to the drop in building permit applications, forcing them to downsize and cut back on resource spending. As a result, many of the remaining code officials do not have time to become familiar with all of the requirements of the energy code, and do not have necessary amount of time to inspect for them.

Figure 5, Construction Decline in Communities of 15,000 or More



Since the economic downturn, government cutbacks and a significant decrease in revenue from building permits has left building departments throughout Nevada's jurisdictions with considerably less funding than they have had in the past. This, as a result, has created gaps in the enforcement of building energy codes in the state as identified by stakeholders.

Gap: Gaps exist in enforcement due to a number of reasons including cutbacks and decrease in local revenue.

Recommendation #7A: A state agency could be granted enforcement authority to oversee enforcement of the energy code in jurisdictions that do not have sufficient infrastructure.

Recommendation #7B: The state could provide assistance for plan review in complex buildings or other specific building types.

Recommendation #7C: The state could consider legislation which would provide the state with the ability to perform plan review and inspection for areas that lack infrastructure. Or the state could provide a mechanism at the state level to hire third party inspectors to perform plan review and inspection for these underserved areas.

Recommendation #7D: Continue to provide assistance to local building departments in utilizing DOE PNNL technical resources to the fullest extent.

Recommendation #7E: Enforcement standards and criteria should be set at the state level including but not limited to the following:

- Requirements governing third party energy code inspectors and plan reviewers.
- Require issuance of a "stop order" for remediation after an inspection and or plan review reveals an energy code violation.
- Require a formal change order and re-review of all energy code violations.
- Require certified training in energy code plan review and inspection for all code officials in charge with energy inspections.
- The state should provide compliance materials, such as checklists, for use at the local building department level.

Recommendation #8: As resources allow, the state should help to subsidize third party inspections for the energy code.

Recommendation #9: As resources allow, the state should provide materials, resources and services to support energy code compliance.

Recommendation #10: The state could help to subsidize:

- The use of handheld electronics to facilitate expediency of building inspections.
- Duct blaster equipment and equipment training.
- Blower door equipment and equipment training.

Training

The biggest barrier to compliance in Nevada as identified by numerous stakeholders is a lack of sufficient energy code training. Familiarity of the IECC among code officials varies, and the best way to improve compliance is to train them on the contents of the IECC, and how to look for its compliance in the field. Training has been a successful method of bringing code inspectors up to speed each time a new code is passed, but the drop in funding has left building departments without the proper resources necessary to train their code inspectors on the new requirements in the IECC. REEEA was awarded a 2010 Department of Energy Code Adoption, Implementation, and Training grant which has shown considerable promise for implementation efforts in Nevada. The project will support stakeholder outreach and communication, code education, training, and technical assistance, development of a database of new construction in order to track compliance, and the development of a five-year strategic plan. The successful completion of this project will assist the state in future compliance of the code, as well as the ability to track building performance.

Training is the single most important task to keep code officials up to date and in the know on what is in the code and how to enforce it. It also keeps builders and contractors aware of the practices required to meet the code.

Gap: In performance of the new training award the state should consider the following:

Recommendation #11A: The state should provide both code officials and building professionals' adequate training, especially when the codes and standards change.

Recommendation #11B: The state should provide incentives or subsidies for training to promote participation (especially important given the busy schedules of contractors).

Recommendation #11C: The state should provide a calendar of events and market training events to affected parties.

Available Staff

Over the past two years, building departments in Nevada have had the unfortunate task of making waves of layoffs among all of their code officials, in some cases reducing their staff by as much as 80%. In other areas, such as Las Vegas, residential construction is once again gaining some momentum, and the department does not have enough staff to keep up, or enough funding to hire additional inspectors. As a result, many home inspections have been delayed, and less time can be spent focusing on compliance with the energy code.

Certification and/or Licensing

In 2001, the Nevada legislature passed NRS 278, which required that all code officials become certified by an official association of code officials,[35] and the standard took effect in 2007. Generally speaking, this requires all energy code officials in Nevada to be certified by the International Code Council (ICC), as other organizations providing energy code certifications are relatively insignificant. With respect to energy codes, a code official can get an ICC certification as a Plans Examiner or an on-site Building Inspector. In Nevada, plans examiners and building inspectors are required to maintain their respective certifications, and many have multiple certifications in order to diversify their resumes and expertise. According to the ICC, there are 48 code officials with energy inspector certifications.[36]

Training and CEUs

One of the most popular and unique training programs in the State of Nevada is its annual EduCode[37] conference, held in Las Vegas. Hosted by the Southern Nevada Chapter of the ICC (SNICC), EduCode draws thousands of code officials from all over Nevada and other Southwestern states for a five day information and training seminar on the ICC suite of codes, including the IECC. The EduCode conference allows code officials in attendance to earn up to 4 continuing education credits, and it comes at a lower cost than standard training. The January - February 2011 conference offered attendees a wide variety of training course selections, including updates to the 2009 IECC and inspection overviews for the code.

With the huge drop in funding, local jurisdictions have not had the resources necessary to offer training to Code Officials outside of EduCode. Therefore, many of the code officials who do not participate at EduCode do not have the necessary training to have complete comprehension of the updates to the IECC, and will have to find other ways to get continuing education credits for their ICC certification. However, through new competitive stimulus grant funding from the U.S. Department of Energy and pursued by REEEA through collaboration with University of Nevada Reno – BEP, Kenergy, BANN, and BCAP, free training to code officials will be provided statewide.

Gap: Resources for training and CEU's are unpredictable.

Recommendation #12: As resources allow, the state could subsidize attendance to future EduCode conferences with the assurance that the energy code will be included in the curriculum.

Recommendation #13: The state should investigate opportunities for sharing and utilizing regional resources.

Third Party Infrastructure

As current economic conditions have caused a huge downturn in construction and professional opportunities for code officials, building departments as a whole have been reluctant to outsource code inspections to third parties. On occasion, builders use a Home Energy Rating System (HERS) rating to demonstrate compliance with the residential energy code, but these third party inspections have dropped over the past two years with the near halt in building construction. When construction is more active, building departments have sometimes been supportive of third party inspections for both residential and commercial inspections.

The Residential Energy Services Network (RESNET) provides federally recognized third-party rating standards for building energy performance. Its website allows homeowners to learn about energy audits and rating processes, as well as easily locate certified energy auditors, raters, and qualified contractors and builders. According to RESNET, there are currently 13 certified HERS raters in Nevada.[38] Raters must complete the required RESNET energy training to be included on this list. In addition, the ENERGY STAR website lists 19 companies and organization that employ qualified raters in the state, although many companies are on both lists.[39]

Design/Construction Community

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

Overview of Design/Construction Community Infrastructure

At the design and construction level, building energy codes are taken very seriously in Nevada. Most architects and builders appear very knowledgeable of the energy code and its requirements, and are supportive of compliance. Furthermore, many architects know the required building codes well enough that they are incorporated from the beginning of the design phase, without hindering the initial

architectural concept. Regardless of whether or not the construction professionals agree with the code, new buildings must comply with the existing codes at the jurisdiction level, and by law the building officials must enforce them.

Somewhat paradoxically, though, many of the residential builders who have survived and begun to stabilize have done so by becoming ENERGY STAR for Homes partners and prioritizing funds to train their employees on building to this standard. This sets them apart in the marketplace. These builders must bring in HERS raters and other third party inspectors at their own cost, but are able to recoup the additional investment through a higher sale price for consumers who want a better quality home with lower operational costs. Design firms have found similar success with LEED, and for many large commercial builders, it has become the standard. Although residential and commercial builders are beholden to the demands of their clients, they can take the initiative to build to higher standards and influence their clients' priorities.

Certification and Licensing

In order to become an architect in Nevada, one must become accredited by the National Council of Architectural Registration Boards (NCARB). NCARB certification requires a great deal of professional development hours, as well as the passage of multiple exams. While these development hours and exams focus on the practice of architecture as a whole, sustainable design and energy efficiency make up a significant portion, the idea being that energy efficiency should be incorporated into building design. Most architects certified by NCARB join the American Institute of Architects (AIA), the professional organization of architects, which has no requirement for certification besides being a registered architect, but has additional requirements for maintaining membership including training.

Contractor registrations in Nevada are managed by the State Contractors Board.[40] To become a registered homebuilder in Nevada one must have experience in the field and pass either the Residential and Small Commercial License exam (B-2 License) or the General Building and General Engineering License exam (AB License).[41] These certifications are not known to cover sustainable construction practices, but do require knowledge of the IBC and IRC, which contain energy-efficiency requirement sections.

Training and CEUs

In order to maintain membership with the AIA, all architects are required to earn a specific number of Continuing Education Units (CEUs). Licensed engineers also need to maintain CEU's. A portion of these credits must be earned in sustainable design, of which energy efficiency is a major factor. Training to earn these CEUs are sometimes provided by or subsidized by the state or local jurisdiction, but architects are usually financially responsible for earning these credits.

> **Recommendation #14A:** Other professional organizations in the state such as local ICC chapters require credentialing of their membership. These organizations could be required to include energy efficiency as a required subject area.

Recommendation #14B: The state could oversee energy code training that is specific to each professional trade.

Recommendation #14C: The state should provide training opportunities for professional trades to obtain and maintain credentials.

Gap: Architects, although ideally positioned to include energy in the design plans of a building, are not always as focused on the energy code with respect to other aspects of building design and construction.

Recommendation #15A: Forge strategic alliances with community colleges especially any that have recently received grants for "green jobs" training to coordinate and encourage (and perhaps provide additional funding for) the inclusion of energy code training (and/or RESNET training[2]) for students who may become code officials or building professionals upon graduation. Structure the collaboration to assure that the community college continues to teach the energy code even when the funding is exhausted so that the next generation of construction trades professionals understand and embrace the importance of including energy efficiency in the design and construction of buildings in Nevada.

Recommendation #15B: Work with AIA to gain their support to promote continuing education courses on energy codes in the short-term.

In the longer term, build a relationship with AIA and the NCARB to get energy code education added as a core requirement to becoming a licensed Architect.

Recommendation #15C: Add the BCAP energy code calculator on the state's website to help educate visitors: http://bcap-ocean.org/resource/energy-code-calculator

Compliance Measurement and Verification

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

[2] RESNET certified home energy raters are able to qualify homes for the Energy Star program.

Past and Current Activities

Currently Nevada has no data on compliance with its energy code, and therefore no method for tracking its effectiveness. REEEA is currently in the process of trying to collect and evaluate compliance data in the state, and has recently reached out to all of the building departments in the state to try to discover the familiarity they have with the energy code.

Gap: Currently, there is no data available for the state to know the level of energy code compliance. There is not a method in place to measure and evaluate compliance with the energy code.

Recommendation #16A: The state should review DOE's guidance on measuring energy code compliance and research the current pilot projects underway in neighboring states.

Recommendation #16B: The M&V strategy should allow for long term reevaluation of targeted cities to track compliance over time.

Recommendation #16C: The M&V plan should account for further work needed to resolve deficiencies that are discovered and reevaluation for these problem areas over time.

Recommendation #16D: The state's assessment of the current infrastructure should include determination of needs and put a plan in place for reassessment at appropriate intervals throughout the year.

Gap: Nevada lacks a funding mechanism to implement many of the recommendations within this report.

Recommendation #17A: As part of educating policy-makers in the state, a Systems Benefit Charge should be advocated for, in order to establish a funding mechanism for the expansion of state services, a support system for builders, additional training for code officials, and the other recommendations herein, which should become part of a larger statewide efforts to reduce energy use in Nevada.

Recommendation #17B: The state should investigate opportunities to credit utilities for their support of energy codes.

Recommendation #17C: All communities that received EECBG funding could be contacted for potential collaboration on outreach efforts in their own communities. These communities have recently received funding for similar efforts and may be more primed for additional energy-related work, especially if they were recognized for their efforts to improve their local communities and economies.

Implementation Summary

Current Best Practices

REEEA was awarded a 2010 Department of Energy Code Adoption, Implementation, and Training grant which has shown considerable promise for implementation efforts in Nevada. The project will support stakeholder outreach and communication, code education, training, and technical assistance, development of a database of new construction in order to track compliance, and the development of a five-year strategic plan. The successful completion of this project will assist the state in future compliance of the code, as well as the ability to track building performance.

In Nevada, enforcement of the energy code is left to the discretion and ability of the local building department or equivalent city agency. The state does however allow jurisdictions to charge fees to cover the costs of enforcement and set the individual enforcement rules at that level, which is typical for most states in the U.S. Through funding from the USDOE, the state is subsidizing part of the cost of training for code officials, particularly for EduCode.

The overarching goal should be that the state is fully covered by state or local-level energy code enforcement and that the construction community has sufficient opportunity to learn about energy code requirements. To be successful REEEA should continue its efforts to assess that each jurisdiction is enforcing the energy code and to what level.

In order to be successful, REEEA and the NSOE will continue to work together to increase REEEA's presence at the local level. Because it is still a new authority with a small number of staff, many jurisdictions are unaware of REEEA and how it's tasks are different from the NSOE. REEEA is currently establishing itself as the jurisdictions' resource for assistance in code adoption and compliance, and this will go a long way to help ensure that every local government is aware of the state-level energy code requirements and is on the right path for compliance with the code.

Gaps and Recommendations

As mentioned above, addressing the following gaps in energy code implementation will help ensure consistency in energy code knowledge and requirements among all stakeholders, increasing support and motivation for compliance.

Gap: Because REEEA is a newly formed agency, some areas of the state are unaware of state activities.

Recommendation #6: As resources allow, REEEA should continue outreach targeted at local involvement in the adoption of the statewide code, and establish itself as the go-to organization for energy code implementation issues.

Gap: Gaps exist in enforcement due to a number of reasons including cutbacks and decrease in local revenue.

Recommendation #7A: A state agency could be granted enforcement authority to oversee enforcement of the energy code in jurisdictions that do not have sufficient infrastructure.

Recommendation #7B: The state could provide assistance for plan review in complex buildings or other specific building types.

Recommendation #7C: The state could consider legislation which would provide the state with the ability to perform plan review and inspection for areas that lack infrastructure. Or the state could provide a mechanism at the state level to hire third party inspectors to perform plan review and inspection for these underserved areas.

Recommendation #7D: Continue to provide assistance to local building departments in utilizing DOE PNNL technical resources to the fullest extent.

Recommendation #7E: Enforcement standards and criteria should be set at the state level including but not limited to the following:

- Requirements governing third party energy code inspectors and plan reviewers.
- Require issuance of a "stop order" for remediation after an inspection and or plan review reveals an energy code violation.
- Require a formal change order and re-review of all energy code violations.
- Require certified training in energy code plan review and inspection for all code officials in charge with energy inspections.
- The state should provide compliance materials, such as checklists, for use at the local building department level.

Recommendation #8: As resources allow, the state should help to subsidize third party inspections for the energy code.

Recommendation #9: As resources allow, the state should provide materials, resources and services to support energy code compliance.

Recommendation #10: The state could help to subsidize:

- The use of handheld electronics to facilitate expediency of building inspections.
- Duct blaster equipment and equipment training.
- Blower door equipment and equipment training.

Gap: In performance of the new training award the state should consider the following:

Recommendation #11A: The state should provide both code officials and building professionals' adequate training, especially when the codes and standards change.

Recommendation #11B: The state should provide incentives or subsidies for training to promote participation (especially important given the busy schedules of contractors).

Recommendation #11C: The state should provide a calendar of events and market training events to affected parties.

Gap: Resources for training and CEU's are unpredictable.

Recommendation #12: As resources allow, the state could subsidize attendance to future EduCode conferences with the assurance that the energy code will be included in the curriculum.

Recommendation #13: The state should investigate opportunities for sharing and utilizing regional resources.

Development of a building begins with its design, so it is important for architects and engineers to know the code. Beginning the design with the energy code in mind and complying with the code from the get-go will save significant time and effort in the construction phase.

Recommendation #14A: Other professional organizations in the state such as local ICC chapters require credentialing of their membership. These organizations could be required to include energy efficiency as a required subject area.

Recommendation #14B: The state could oversee energy code training that is specific to each professional trade.

Recommendation #14C: The state should provide training opportunities for professional trades to obtain and maintain credentials.

Gap: Architects, although ideally positioned to include energy in the design plans of a building, are not always as focused on the energy code with respect to other aspects of building design and construction.

Recommendation #15A: Forge strategic alliances with community colleges especially any that have recently received grants for "green jobs" training to coordinate and encourage (and perhaps provide additional funding for) the inclusion of energy code training (and/or RESNET training[3]) for students who may become code officials or building professionals upon graduation. Structure the collaboration to assure that the community college continues to teach the energy code even when the funding is exhausted so that the next generation of construction trades professionals understand and embrace the importance of including energy efficiency in the design and construction of buildings in Nevada.

Recommendation #15B: Work with AIA to gain their support to promote continuing education courses on energy codes in the short-term.

In the longer term, build a relationship with AIA and the NCARB to get energy code education added as a core requirement to becoming a licensed Architect.

[3] RESNET certified home energy raters are able to qualify homes for the Energy Star program.

Recommendation #15C: Add the BCAP energy code calculator on the state's website to help educate visitors: http://bcap-ocean.org/resource/energy-code-calculator

As part of Nevada's recent DOE grant, the state will institute a new program for compliance measurement and verification (M&V). Successful completion will allow the state to track the effectiveness of the code and make improvements moving forward with each new code. When designing the program, the state should continue to demonstrate the following objectives:

Gap: Currently, there is no data available for the state to know the level of energy code compliance. There is not a method in place to measure and evaluate compliance with the energy code.

Recommendation #16A: The state should review DOE's guidance on measuring energy code compliance and research the current pilot projects underway in neighboring states.

Recommendation #16B: The M&V strategy should allow for long term reevaluation of targeted cities to track compliance over time.

Recommendation #16C: The M&V plan should account for further work needed to resolve deficiencies that are discovered and reevaluation for these problem areas over time.

Recommendation #16D: The state's assessment of the current infrastructure should include determination of needs and put a plan in place for reassessment at appropriate intervals throughout the year.

Gap: Nevada lacks a funding mechanism to implement many of the recommendations within this report.

Recommendation #17A: As part of educating policy-makers in the state, a Systems Benefit Charge should be advocated for, in order to establish a funding mechanism for the expansion of state services, a support system for builders, additional training for code officials, and the other recommendations herein, which should become part of a larger statewide efforts to reduce energy use in Nevada.

Recommendation #17B: The state should investigate opportunities to credit utilities for their support of energy codes.

Recommendation #17C: All communities that received EECBG funding could be contacted for potential collaboration on outreach efforts in their own communities. These communities have recently received funding for similar efforts and may be more primed for additional energy-related work, especially if they were recognized for their efforts to improve their local communities and economies.

Stakeholders

Saving energy through energy code compliance is the ultimate goal of the energy codes process. Yet this outcome requires buy-in, support, and input from a diverse group of energy code champions. On the frontlines are the inspection and design and construction communities, without whom energy codes cannot succeed. State legislators, city council members, mayors' offices, and other policymakers need to understand the value of energy codes and enact policies that assist enforcement and compliance. Utilities, state and local agencies, environmental and energy efficiency organizations, consumer groups, and other interested parties each can play crucial roles in promoting codes, funding and improving the energy code infrastructure, providing technical expertise and materials, and strengthening support for building energy efficiency on the national, regional, state, and local levels.

Supporting Organizations

Stakeholders' Role in Promoting Codes

An active promoter of energy codes in Nevada is the Southwest Energy Efficiency Project (SWEEP). The energy efficiency advocacy group for the Southwest region, SWEEP maintains a small staff base in Nevada specifically, and they as well as other energy code staff members assist in the adoption and implementation of the IECC on both the state and local levels. SWEEP advocated for the adoption of the 2006 IECC statewide, and after the passage of SB73 and SB358, the organization stayed on the ground in Northern Nevada to assist with the implementation of the new code. Now that the 2006 IECC has been adopted by nearly every jurisdiction in Nevada, SWEEP has shifted its focus back to advocating for and assisting with adoption of the 2009 IECC and promoting the code to all stakeholders in Nevada.

Additionally, the Southern Nevada Home Builders Association (SNHBA) is very supportive of energy code adoption and implementation. Because of the advanced code programs like ENERGY STAR and the Southern Nevada Green Building Partnership have such a market penetration in the Las Vegas Area, homebuilder support for energy efficiency is exceptionally high, and the existing infrastructure makes IECC compliance much easier. Most recently, the SNHBA played a supporting role in the development of the new Southern Nevada Energy Code, which will enforce the 2009 IECC and become mandatory on July 1, 2011.

As mentioned before, BANN, SWEEP and the SNHBA have played an active role in promoting the adoption and implementation of model energy codes in Nevada. SWEEP has been very active on the ground promoting code adoption, especially in advocacy efforts in Northern Nevada after the 2006 IECC was passed statewide. The SNHBA has traditionally played a supporting role in code adoption in Southern Nevada, as many of the homebuilders are already behind energy efficiency as evidenced by the market transformation to ENERGY STAR.

Some of the other supporting organizations that have played active roles in Nevada include:

University of Nevada, Reno (UNR) Business Environmental Program (BEP)
The UNR Business Environmental Program was established in 2001 and has 11 offices statewide. The program offers training and education on energy efficiency and best practices, including energy code training, throughout Nevada. The program is supportive of advancing energy codes and is an active participant in the Nevada Chapter of the USGBC and Sierra club.

Builders Association of Northern Nevada (BANN)
Northern Nevada builders association is a major proponent of energy efficiency and codes. BANN has a history of bringing together stakeholders to realize the objectives of code adoption and has been a promoter of energy efficient design and construction. The organization has made great strides in attempting to bring energy efficiency to the forefront of residential construction.

The Northern Nevada Building Officials and Contractor Associations have been very active over the past 20 years in supporting energy code efforts in the State. The first energy code adopted in Nevada was in Northern Nevada. Northern Nevada building officials and trade associations made an agreement in 2007 to bypass the 2009 ICC code family based on the depressed economy. Understanding the commitment made by the state upon receipt of ARRA funding in 2009, BANN has worked closely to promote adoption of the 2009 IECC.

NVEnergy
The major electric utility in the state, NVEnergy has conducted a great deal of outreach toward consumers promoting the benefits of energy efficiency. The NVEnergy website provides visitors with energy saving tips for at home and at work, promotion of why energy efficiency is important, and descriptions of what the utility has done to increase efficiency. In addition, the site offers a free online energy audit and provides rebates and incentives for making home improvements, such as rebates on air conditioners for homes in Southern Nevada and heating units for homes in Northern Nevada.

Sierra Club/Sierra Club Green Home (SCGH)
Founded by the Sierra Club and headquartered in Las Vegas, SCGH plays a large role in Southern Nevada in consumer outreach. SCGH promotes energy efficiency in the home, and provides consumers with energy saving tips and education on how to do so. Included on the organization's site is a resource and video library, a carbon footprint calculator, and links to providers of home energy efficiency improvement products and services.

Responsible Energy Codes Alliance (RECA)
Headquartered in Washington, D.C., RECA works on a national level as the association of product manufactures in support of codes to improve energy efficiency in buildings.[42] Generally, RECA will work with other advocacy groups to promote the adoption and implementation of energy codes whenever a state is in the code change process. Most recently, RECA sent a letter of support to REEEA backing their proposal to adopt the 2009 IECC statewide, and offered its assistance as necessary.

These groups can raise awareness of energy efficiency issues, often directly to energy consumers. When consumers start caring about energy issues, it increases demand for energy-efficient construction, which creates an environment in which improved construction practices and techniques required to meet the

provisions of the latest energy codes become standard practice. This, in turn, allows for the adoption and implementation of even more efficient energy codes.

> **Gap**: Many consumers do not realize that there is a mandatory statewide energy code, or if their home meets the code and others are unaware of the amount of energy and money they would save if they lived in a home that was built to the latest model energy codes.
>
> **Recommendation #18:** NVEnergy and SCGH, as well as other stakeholder organizations, could promote energy codes to their audience to help transform the market to place higher demand for homes that meet the mandatory energy code.
>
> **Recommendation #19:** The state should seek partnerships with manufacturers and big box retailers to promote energy efficient products and services.

New Partnerships

A great opportunity exists for organizations to become more involved in code compliance and enforcement. UNR and BANN have worked with REEEA in the past and are collaborating on the new DOE code compliance proposal together, and this will give these organizations the opportunity to promote code compliance. However, NVEnergy and SCGH could also work with REEEA in some capacity to inform consumers of the benefits of energy codes specifically, which could in turn increase the demand for new homes that comply with the model energy codes.

Additionally, REEEA could look to form partnerships with other state agencies in Nevada. The Nevada State Office of Energy (NSOE), which was the previous agency responsible for the adoption of the statewide energy code, should work with REEEA to promote the energy code to consumers and local jurisdictions and provide resources for compliance. Other organizations that REEEA could work with to promote codes to consumers include the Nevada Division of Environmental Protection and the Nevada Real Estate Division.

> **Gap**: Product manufactures in the state are an untapped resource.
>
> **Recommendation #20:** The state should utilize the untapped resource of product manufacturers to grow the circle of energy code supporters at the state level. RECA (see above) is a perfect example of how industry can be organized to be involved in energy codes.

Stakeholders Summary

Current Best Practices

Many organizations have done an exemplary job of promoting energy efficiency to consumers in Nevada and helping them realize the benefits of incorporating it into their everyday lives. Moreover, SWEEP, SNHBA, BANN, and UNR are proponents of building energy codes on some level. These stakeholders have helped to move the code forward in Nevada through advocacy efforts, training, and outreach.

Gaps and Recommendations

While NVEnergy and SCGH have done an excellent job in consumer outreach on energy efficiency specifically, a gap still exists because of the lack of awareness among consumers of the energy code. Many consumers do not realize that there is a mandatory statewide energy code, or if their home meets the code and others are unaware of the amount of energy and money they would save if they lived in a home that was built to the latest model energy codes. NVEnergy and SCGH, as well as other stakeholder organizations, could promote energy codes to their audience to help transform the market to place higher demand for homes that meet the mandatory energy code. There is an opportunity for stakeholders to participate in projects that promote code compliance which will ultimately drive code awareness and compliance rates up.

> **Gap**: Many consumers do not realize that there is a mandatory statewide energy code, or if their home meets the code and others are unaware of the amount of energy and money they would save if they lived in a home that was built to the latest model energy codes.
>
> **Recommendation #18:** NVEnergy and SCGH, as well as other stakeholder organizations, could promote energy codes to their audience to help transform the market to place higher demand for homes that meet the mandatory energy code.
>
> **Recommendation #19:** The state should seek partnerships with manufacturers and big box retailers to promote energy efficient products and services.

In addition, there are a number of product manufacturers with stake in Nevada that could organize to promote codes. Many of these manufactures pride themselves on producing construction materials that significantly improve energy performance in homes and buildings. More stringent energy codes and greater compliance will benefit these businesses greatly, as use of the products they sell will become the standard of construction in Nevada. The following is an incomplete list of product manufacturer stakeholders who have an office or plant location in Nevada:

- ACH Foam Technologies, *Foam Insulation*
- CertainTeed Corporation, *Gypsum Board*
- Envirosep, *HVAC, Water Heaters, and Electrical Controls*
- Firestone Building Products, *Roofing Systems*
- Haws Corporation, *Water Distribution and Temperature Management Products*
- Honeywell Corporation, *HVAC Equipment and Supplies*
- Johns Manville, *Roofing Systems*
- Phoenix Door Manufacturing Company
- R Max, *Insulation Materials*
- United Solar Energy, *Passive Solar Hot Water Heaters*
- USG Interiors, *Mineral Fiber Board*

Gap: Product manufactures in the state are an untapped resource.

Recommendation #20: The state should utilize the untapped resource of product manufacturers to grow the circle of energy code supporters at the state level. RECA (see above) is a perfect example of how industry can be organized to be involved in energy codes.

Conclusion

Building energy codes are one of the easiest and most cost-effective ways for Nevada to secure its energy future. Not only will they help consumers save money on their energy bill, code compliance will reduce the load on the grid, resulting in a cleaner environment and a protected and diverse energy supply. In many parts of the state the attitude and the infrastructure is already in place, but stressing that the code is mandatory statewide, ensuring high compliance rates, and creating a demand for compliance will help Nevada continued in the right direction toward greater energy efficiency.

Through continued communication and assumed authority as the organization responsible for the implementation of the statewide energy codes, REEEA can help pave the way toward energy efficiency through codes. Together with other state agencies and local level governments, REEEA can provide the training and resources necessary to keep the building community up-to-speed on the current energy code and its requirements. They can also shape the local building departments to take an even more active role in energy code enforcement, and the design and construction communities to encourage more awareness and familiarity of the code and the benefits of energy efficiency. By intensifying the implementation of the model energy code, Nevada will ensure that it reaps all of the benefits they have the potential to provide.

The recommendations made as a result of this gap analysis, summarized below in figure 6, are meant to guide the stakeholders in Nevada to meet these goals for code adoption and implementation and help in the development of a compliance action plan. Though some recommendations may require increased funding over extended periods of time, an action plan will help make sure that new construction in Nevada achieves 100% compliance to model energy codes now and in the future.

Figure 6. Recommendations Table

Adoption	Page
State Policy	
Nevada should adopt and automatic code update process for future code iterations	18, 25
The state could take the extra measure of outreach to rural parts of the state	18, 26
The code for state-funded buildings should be more stringent than that for private construction	19, 26
Nevada integrate codes into its statewide energy efficiency plans	19, 26
The state should assess the impact of rural noncompliance of the energy code	23, 26
Implementation	**Page**
Outreach	
REEEA should continue outreach at the local level on the importance and benefits of energy codes	28, 37
The state should add the BCAP energy code calculator to its website to educate visitors	35, 40
Training	
The state should provide stakeholders with adequate training, especially when standards change	32, 38
The state should provide a calendar of events and incentives for participation	32, 39
The state could subsidize future EduCode/IECC training events	32, 39
Enforcement Community	
The state should oversee enforcement of codes in areas that lack sufficient infrastructure	30, 38
The state could provide assistance in complex building plan review	30, 38
The state could continue to utilize DOE PNNL resources to offer localized technical assistance	30, 38
The state could set enforcement standards at the state level	31, 38
The state should help 3rd party inspections where necessary	31, 38
The state should provide materials, resources, and services to support compliance	31, 38
Design/Construction Community	
Professional organizations should require credentialing, with energy efficiency included, in membership	35, 39
The state could oversee energy code training specific to each trade	35, 39
The state should forge strategic alliances with community colleges receiving grants for “green jobs”	35, 39
The state should work with AIA and NCARB to integrate energy codes into education requirements	35, 40
Measurement and Verification	
The state should employ an M&V strategy which follows DOE’s guidance on measuring compliance	36, 40
The state should assess current infrastructure and put in a plan for reassessment throughout the year	36, 40
The state should advocate for a Systems Benefits Charge	36, 40
Communities that received EECBG funding should be contacted for potential collaboration	36, 40
Stakeholders	**Page**
Stakeholder organizations could promote energy codes to their audiences to help transform the market	44, 45
The state should seek partnerships with manufacturers and big box retailers	44, 45
The state should utilize manufacturers to grow the circle of energy code supporters at the state level	44, 46

Appendix A

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

Resource Guides for Code Officials

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

Energy Code Compliance Training Materials:

1. Commercial PowerPoint Training with links to videos
   http://www.energycodes.gov/becu/documents/Commercial_90_Percent_Eval_Inspect_Training.pdf

2. Residential PowerPoint Training with links to videos
   http://www.energycodes.gov/becu/documents/Residential_90_Percent_Eval_Inspect_Training.pdf

Primer on Res*check* and Com*check*

1. Commercial Compliance
   http://www.energycodes.gov/comcheck/

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

Available Downloads

1. Commercial Basic Requirements Download
   http://www.energycodes.gov/comcheck/download.stm
2. Residential Basic Requirements Download
   http://www.energycodes.gov/rescheck/download.stm

Users Guides

1. COM*check* Software Guide
   http://www.energycodes.gov/comcheck/documents/com_software_users_guide_2004_2006_and_2009_IECC.pdf
2. RES*check* Software Guide
   http://www.energycodes.gov/rescheck/documents/rescheck_users_guide_1008.pdf

Plan Check and Field Inspection

1. Commercial Plan Review Quick Reference Guide
   http://www.energycodes.gov/training/pdfs/comm_review_guide1.pdf
2. Residential Plan Review Quick Reference Guide
   http://www.energycodes.gov/rescheck/documents/res_review_guide.pdf
3. Code Notes
   http://www.energycodes.gov/help/notes.stm

References

[1] http://tonto.eia.doe.gov/energyexplained/index.cfm?page=us_energy_use
[2] http://www.bls.gov/web/laus/laumstrk.htm
[3] http://www.census.gov/const/www/C40/annualhistorybystate.pdf
[4] http://www.uli.org/~/media/Documents/ResearchAndPublications/EmergingTrends/Americas/2011/ET_US2011.ashx
[5] http://www.eia.doe.gov/emeu/states/_seds.html
[6] http://www.nvenergy.com/renewablesenvironment/renewables/solar.cfm
[7] http://tonto.eia.gov/state/state_energy_profiles.cfm?sid=NV
[8] http://www.eia.gov/cneaf/electricity/epm/epmxlfile5_6_a.xls
[9] http://www.eia.gov/emeu/states/hf.jsp?incfile=sep_sum/plain_html/rank_use_per_cap.html
[10] http://bcap-ocean.org/incremental-cost-analysis
[11] http://bcap-ocean.org/sites/default/files/publ_109-058.pdf
[12] http://frwebgate.access.gpo.gov/cgi-bin/getdoc.cgi?dbname=111_cong_bills&docid=f:h1enr.pdf
[13] http://www.energy.gov/InYourState.htm, Nevada page
[14] http://energy.state.nv.us/energy-efficiency/programs/eecbg-grants.html
[15] http://renewableenergy.state.nv.us/documents/Comments/NoticeOfRequestForCommentsNRS701-220.pdf
[16] http://spwb.state.nv.us/PDFs/adopted-standards-2010.pdf
[17] http://www.usgbc.org/DisplayPage.aspx?CMSPageID=1852#NV
[18] http://gov.state.nv.us/Climate/FinalReport/ClimateChangeReport.pdf
[19] http://www.leg.state.nv.us/74th/Reports/history.cfm?billname=AB621
[20] http://www.usgbc.org/LEED/Project/CertifiedProjectList.aspx
[21] https://ssl27.cyzap.net/gbcicertonline/onlinedirectory/
[22] http://www.energystar.gov/index.cfm?fuseaction=new_homes_partners.locator Nevada page
[23] http://www.census.gov/popest/states/NST-ann-est.html
[24] http://apps1.eere.energy.gov/buildings/building_america/cfm/project_locations.cfm
[25] http://www.usmayors.org/climateprotection/ClimateChange.asp
[26] http://www.iclei.org/index.php?id=global-members
[27] http://www.usgbc.org/DisplayPage.aspx?CMSPageID=1852#NV
[28] http://library6.municode.com/default-now/template.htm?view=browse&doc_action=setdoc&doc_keytype=tocid&doc_key=1db3c86b2bea1008a30bee4b31efd0c3&infobase=16249
[29] http://www.cityofhenderson.com/city_clerk/Ordinances_Pending_Codification/pdf/OrdinanceNo2842_DevelopmentCode.pdf
[30] http://www.lasvegasnevada.gov/files/GreenBuildingProgramFINAL.pdf
[31] http://library.municode.com/index.aspx?clientId=16023&stateId=28&stateName=Nevada
[32] http://library.municode.com/HTML/14345/level2/C18.08_AIII.html#C18.08_AIII_s18.08.301
[33] http://www.leg.state.nv.us/75th2009/Reports/history.cfm?ID=153
[34] http://www.leg.state.nv.us/75th2009/reports/history.cfm?ID=978
[35] http://www.leg.state.nv.us/Statutes/71st/Stats200109.html#Stats200109page1245
[36] https://av.iccsafe.org/EWEB/DynamicPage.aspx?Site=icc&WebKey=b7afd990-2e14-4013-a186-aeb405641a95&FromSearchControl=Yes
[37] http://educode.snicc.org/welcome.html
[38] http://www.resnet.us/directory/auditor/nv/89/home-energy-raters-hers-raters/1
[39] http://www.energystar.gov/index.cfm?fuseaction=NEW_HOMES_PARTNERS.showStateResults&s_code=NV
[40] http://www.nvcontractorsboard.com/index.html
[41] http://www.leg.state.nv.us/NAC/NAC-624.html#NAC624Sec140
[42] http://reca-codes.org/