The 2013 State Energy Efficiency Scorecard

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Executive Summary

Conversations about energy use in the United States often revolve around the need to support the growth of our national economy through expanding the energy supply. There is, however, a resource that is cleaner, cheaper, and quicker to deploy than building new supply—energy efficiency. Energy efficiency improvements help businesses, governments, and consumers meet their needs by using *less* energy, saving them money, driving investment across all sectors of the economy, creating much needed jobs, and reducing the myriad of environmental impacts of the energy production system.

Governors, legislators, regulators, and citizens are increasingly recognizing that energy efficiency is a crucially important state resource. In fact, a great deal of the innovation in policies and programs that promote energy efficiency originates in states. The *2013 State Energy Efficiency Scorecard* captures this activity through a comprehensive analysis of state efforts to support energy efficiency.

In this seventh edition of ACEEE's *State Energy Efficiency Scorecard*, we rank states on their policy and program efforts, and provide recommendations for ways that states can improve their energy efficiency performance in a variety of policy areas. The *State Scorecard* serves as a benchmark for state efforts on energy efficiency policies and programs each year, encouraging states to continue strengthening their efficiency commitments as a pragmatic and effective strategy for promoting economic growth, securing environmental benefits, and increasing their communities' resilience in the face of the uncertain costs and supplies of the energy resources on which they depend.

KEY FINDINGS

- **Massachusetts** retained the top spot in the *State Energy Efficiency Scorecard* rankings for the third year in a row, having overtaken California in 2011, based on its continued commitment to energy efficiency under its Green Communities Act of 2008. Among other things, the legislation spurred greater investments in energy efficiency programs by requiring utilities to save a large and growing percentage of energy every year through efficiency measures.

- Joining Massachusetts in the top five are **California, New York, Oregon,** and **Connecticut**. These states continue to comprise the group of truly leading states that have made broad, long-term commitments to developing energy efficiency as a state resource. This is the first year that Connecticut has placed in the top five since 2009.

- **Rhode Island, Vermont, Washington, Maryland, and Illinois** rounded out the top tier. This is the first year that Illinois has broken into the top ten.

- This year's most improved states were **Mississippi, Maine, Kansas, Ohio,** and **West Virginia**. Most-improved states made large strides in both points gained and overall ranking. These five states have made strides in a variety of areas. In 2013, the Mississippi legislature passed laws setting a mandatory energy code for commercial and state-owned buildings, and began implementing enhanced lead by example programs. Efforts to ramp up utility programs to meet energy efficiency resource

standard (EERS) targets resulted in dramatically increased electricity savings in Ohio (even despite significant pushback efforts). Both Kansas and West Virginia committed to improving building codes, significantly increasing their scores in that policy area. Maine's rise in the ranks is due to legislation passed in June 2013 that returned full funding to Efficiency Maine for implementation of energy efficiency programs after several years in which programs had been under-funded.

- Other states have also made recent concentrated efforts related to energy efficiency. **Arkansas, Indiana,** and **Pennsylvania** continued to reap the benefits of their EERS policies, which led to substantially higher electricity efficiency program spending and savings compared to what we reported in the *2012 State Energy Efficiency Scorecard*. **Connecticut** also passed a major energy bill in June 2013, calling for the benchmarking of state buildings, expanding combined heat and power (CHP) programs, and doubling funding for energy efficiency programs.

- The leading states in utility-sector energy efficiency programs and policies, which are covered in Chapter 2, were **Massachusetts**, **Vermont**, and **Rhode Island**. All three of these states have long records of success and continued to raise the bar on the delivery of cost-effective energy efficiency programs and policies.

- Annual budgets for utility-sector natural gas efficiency programs totaled $1.3 billion nationally in 2012, an 18% increase over the previous year. Electric program budgets rose slightly to $5.98 billion in 2012.

- Savings from electric efficiency programs in 2011 totaled approximately 22.9 million MWh, a 20% increase over the previous year. Gas savings are reported for the first time at 232.3 million therms (MMTherms).

- Twenty-six states have adopted and adequately funded an EERS, which sets long-term energy savings targets and drives investments in utility-sector energy efficiency programs. The states with the most aggressive savings targets included **Arizona, Massachusetts, New York,** and **Rhode Island**.

- The leading states in building energy codes and compliance—covered in Chapter 4—were **California, Washington,** and **Rhode Island**. During the past year, seven states adopted the latest iteration of building energy codes.

- **California** and **New York** led the way in energy-efficient transportation policies. California's requirements for reductions in greenhouse gas (GHG) emissions have led it to identify several strategies for smart growth, while New York is one of the few states in the nation to have a concrete vehicle miles traveled reduction target.

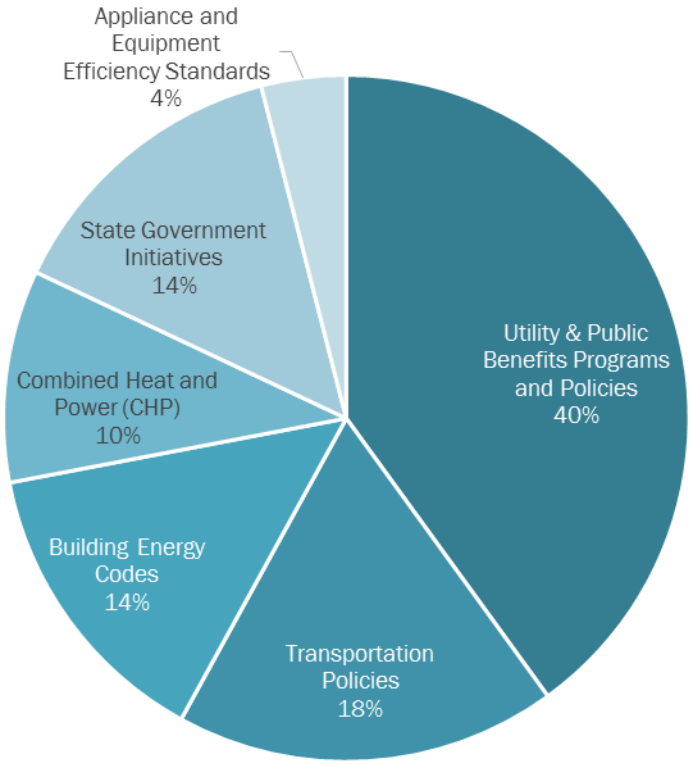
- Twenty states fell in the rankings this year, due to both changes in our methodology and substantive changes in their performance. **Idaho** fell the furthest, by nine spots, largely because it did not keep up with peer states in utility efficiency spending and savings. **Wisconsin** dropped six spots due to a significant drop in energy savings realized by the state's efficiency program.

METHODOLOGY

The *2013 State Energy Efficiency Scorecard* provides a broad assessment of policies and programs that improve energy efficiency in our homes, businesses, industries, and transportation systems. The *State Scorecard* examines the six policy areas in which states typically pursue energy efficiency: utility and "public benefits" programs and policies; transportation polices; building energy codes and compliance; CHP policies; appliance and equipment standards; and state government-led initiatives around energy efficiency. Figure ES-1 provides a percentage breakdown of the points assigned to each policy area.

The baseline year against which we assessed policy and program varies by policy area. Most scores were based on policies in place as of August 2013. In Chapter 2, Utility and Public Benefits Programs and Policies, however, we scored states based on data from 2012 and 2011, the latest years in which data were available for our metrics.

Figure ES-1. Percentage of Total Points by Policy Area



We reached out to each state utility commission to review spending and savings data for the customer-funded energy efficiency programs presented in Chapter 2. In addition, state energy officials were given the opportunity to review the material in ACEEE's State Energy Efficiency Policy Database (ACEEE 2013) and to provide updates to the information scored in Chapters 3 (Transportation), 4 (Building Codes), and 6 (State Government–Led Initiatives).

This year we updated the scoring methodology in three policy areas to better reflect potential energy savings, economic realities, and changing policy landscapes. In Chapter 2, Utility and Public Benefits Programs and Policies, we found that the median budget for both electricity and natural gas efficiency programs had risen significantly this year, and we updated our allocation of points to reflect this increase in spending. We similarly increased the stringency of our scoring for electricity savings, reflecting the rising savings targets of many states as they ramp up their efficiency programs. Notably, we also scored states on their natural gas savings this year as these programs continue to make up a larger portion of efficiency portfolios.

We have adjusted our scoring criteria for building energy codes in Chapter 4 to reflect ACEEE's increased effort to collect data on compliance activities. As in the past, five (5) points were awarded for code stringency. This year, the remaining two (2) points were awarded for specific compliance activities, including policy drivers for compliance such as a strategic compliance plan, and performance metrics such as completion of a baseline study, presence of an active stakeholder advisory group, and utility involvement in compliance.

In Chapter 6, State Government–Led Initiatives, we included an additional category for laws requiring disclosure of buildings' energy use. In the past, we scored disclosure laws in combination with financial incentives for energy efficiency. To account for an increased emphasis on building energy disclosure by policymakers, we chose to score disclosure laws independently from other state-offered incentives, and reallocated points accordingly. This year, one (1) point was awarded to states with commercial and residential disclosure rules. States could receive up to two and one-half (2.5) points for customer financial incentive programs. Data on research and development at the state level are inconsistent, so we removed one-half (0.5) point from this category, awarding states with at least three research and development programs one and one-half (1.5) points.

RESULTS

Figure ES-2 shows states' rankings in the *2013 State Energy Efficiency Scorecard*, dividing them into five tiers for ease of comparison. Table ES-1 provides details of the scores for each state. States could score a maximum of 50 points, allocated across six policy areas. An identical ranking for two or more states indicates a tie (e.g., New Jersey, Arizona, Michigan, and Iowa all rank 12th). Although we provide individual state scores and rankings, the difference between states is both easiest to understand and most instructive in tiers of roughly ten states, as the point differential between groups of states is generally much larger than between individual states.

Figure ES-2. *2013 State Scorecard* Rankings Map

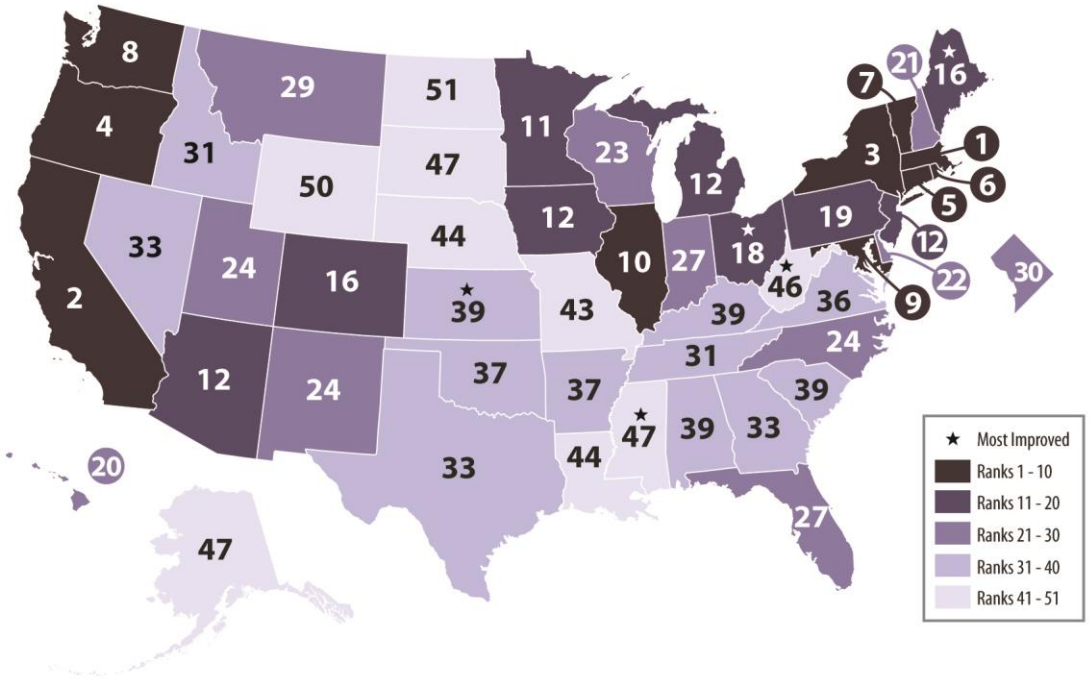


Table ES-1. Summary of States' Total Scores

Rank	State	Utility & Public Benefits Programs & Policies (20 pts.)	Trans-portation Policies (9 pts.)	Building Energy Codes (7 pts.)	Combined Heat & Power (5 pts.)	State Government Initiatives (7 pts.)	Appliance Efficiency Standards (2 pts.)	**TOTAL SCORE (50 pts.)**	Change in rank from 2012	Change in score from 2012
1	Massachusetts	19	7.5	5.5	4.5	5.5	0	**42**	0	-1.5
2	California	15	7.5	7	3	6.5	2	**41**	0	0.5
3	New York	16	8	5.5	2.5	6	0	**38**	0	-1
4	Oregon	14.5	7	5.5	3.5	5.5	1	**37**	0	-0.5
5	Connecticut	14	5.5	5.5	4	6	1	**36**	1	1.5
6	Rhode Island	18.5	5.5	6	2	3	0.5	**35.5**	1	2.5
7	Vermont	18.5	4.5	5.5	2	4	0	**34.5**	-2	-1
8	Washington	13	7	6	2.5	4.5	0.5	**33.5**	0	1.5
9	Maryland	8.5	6	5.5	2	5	0.5	**27.5**	0	-2.5
10	Illinois	9.5	4	5.5	2	5	0	**26**	4	1
11	Minnesota	15	2	3	1	4.5	0	**25.5**	-2	-4.5
12	New Jersey	8.5	6	4	2.5	3.5	0	**24.5**	4	0
12	Arizona	12	2.5	3.5	2.5	3.5	0.5	**24.5**	0	-1
12	Michigan	11	3	4	2	4.5	0	**24.5**	0	-1
12	Iowa	12	2	5.5	1.5	3.5	0	**24.5**	-1	-2
16	Maine	10.5	6	2.5	2	2	0	**23**	9	4
16	Colorado	10.5	2	4.5	1.5	4.5	0	**23**	-2	-2
18	Ohio	11	0	4	3.5	4	0	**22.5**	4	3
19	Pennsylvania	6	6	4	1.5	4.5	0	**22**	1	0.5
20	Hawaii	10	2.5	4	0.5	3.5	0	**20.5**	-2	-1.5
21	New Hampshire	8.5	1	4.5	1.5	4	0.5	**20**	-3	-2
22	Delaware	2.5	5.5	4.5	1.5	4.5	0	**18.5**	5	0
23	Wisconsin	7.5	1	3.5	2	4	0	**18**	-6	-4.5
24	New Mexico	7	2	4	1.5	3	0	**17.5**	3	-1
24	North Carolina	4.5	2.5	4	2	4.5	0	**17.5**	-2	-2
24	Utah	7.5	0.5	4.5	1.5	3.5	0	**17.5**	-3	-2.5
27	Indiana	8.5	0	3.5	1.5	2	0	**15.5**	6	1.5
27	Florida	2.5	4.5	4.5	1	3	0	**15.5**	2	-2
29	Montana	6	1	4	0.5	3.5	0	**15**	-4	-4
30	District of Columbia	3.5	3.5	3.5	1	2	0.5	**14**	-1	-3.5
31	Tennessee	2	2.5	2.5	1	5.5	0	**13.5**	1	-1.5
31	Idaho	5.5	0	4.5	0	3.5	0	**13.5**	-9	-6
33	Georgia	1.5	3	4	0.5	3.5	0.5	**13**	0	-1
33	Texas	2	1	4	2	3.5	0.5	**13**	0	-1
33	Nevada	5	0	4.5	1	2.5	0	**13**	-2	-3.5
36	Virginia	1	2.5	4	0.5	4.5	0	**12.5**	1	-0.5
37	Oklahoma	4	0.5	4	0	3.5	0	**12**	2	1
37	Arkansas	6	0	3.5	0.5	2	0	**12**	0	-1
39	Kansas	0.5	1	4	1	5	0	**11.5**	6	3
39	Alabama	2.5	0	4	0.5	4.5	0	**11.5**	1	1
39	South Carolina	3	1	4	0.5	3	0	**11.5**	1	1
39	Kentucky	3.5	0	3.5	0	4.5	0	**11.5**	-3	-2
43	Missouri	4	0	3	0.5	3	0	**10.5**	0	1.5
44	Louisiana	2.5	1	3.5	0.5	2	0	**9.5**	-1	0.5
44	Nebraska	1	0	5	0	3.5	0	**9.5**	-2	0
46	West Virginia	1	1.5	4	1	1.5	0	**9**	3	3
47	Mississippi	1	0.5	3	0	3.5	0	**8**	4	5.5
47	Alaska	0	1	1.5	0.5	5	0	**8**	-1	0
47	South Dakota	4	0	1	1	2	0	**8**	-1	0
50	Wyoming	2	0	2	0	1.5	0	**5.5**	-2	-1
51	North Dakota	0.5	1	1.5	0.5	0	0	**3.5**	-1	-0.5

STRATEGIES FOR IMPROVING ENERGY EFFICIENCY

Put in place, and adequately fund, an energy efficiency resource standard or similar energy savings target. These policies establish specific energy savings targets that utilities or independent statewide program administrators must meet through customer energy efficiency programs. They serve as an enabling framework for cost-effective investment, savings, and program activity. EERS policies can have a catalytic effect on increasing energy efficiency and its associated economic and environmental benefits.

Examples: Massachusetts, Arizona, Hawaii, Vermont

Adopt updated, more stringent building energy codes, improve code compliance, and enable the involvement of efficiency program administrators in code support. Buildings consume more than 40% of total energy in the United States, making them an essential target for energy savings. Mandatory building energy codes are one way to ensure a minimum level of energy efficiency for new residential and commercial buildings.

Examples: California, Rhode Island, Illinois, Mississippi

Adopt stringent tailpipe emissions standards for cars and trucks, and set quantitative targets for reducing vehicle miles traveled. Like buildings, transportation consumes a substantial portion of total energy in the United States. Although new federal fuel economy standards have been put in place, states will realize greater energy savings and pollution reduction if they adopt California's more stringent tailpipe emissions standards (a proxy for reducing energy use).

Examples: California, New York, Massachusetts, Oregon

Treat CHP as an energy efficiency resource equivalent to other forms of energy efficiency. Many states list CHP as an eligible technology within their EERSs or renewable portfolio (RPS) standards, but they relegate it to a bottom tier. ACEEE recommends that CHP be given equal footing, which requires the state to develop a specific methodology for counting energy savings attributed to the utilization of CHP. If CHP is allowed as an eligible resource, EERS target levels should be increased to take into account the CHP potential.

Example: Massachusetts

Expand state-led efforts and make them visible. Efforts may include putting in place sustainable funding sources for energy efficiency incentive programs; leading by example by incorporating energy efficiency into government operations; and investing in energy efficiency-related research, development, and demonstration centers. States have many opportunities to lead by example, including reducing energy use in public buildings and fleets, demonstrating the market for energy service companies that finance and deliver energy-saving projects, and funding research centers that focus on breakthroughs in energy-efficient technologies.

Examples: New York, Maryland, Alaska

Introduction

Conversations about energy use in the United States often revolve around the need to support the growth of our national economy through expanding the energy supply. There is, however, a resource that is cleaner, cheaper, and quicker to deploy than building new supply—energy efficiency. Energy efficiency improvements help businesses, governments, and consumers meet their needs by using *less* energy, saving them money, driving investment across all sectors of the economy, creating much needed jobs, and reducing the myriad of environmental impacts of the energy production system.

Governors, legislators, regulators, and citizens are increasingly recognizing that energy efficiency is a crucially important state resource. In fact, a great deal of the innovation in policies and programs that promote energy efficiency originates in states. The *2013 State Energy Efficiency Scorecard* captures this activity through a comprehensive analysis of state efforts to support energy efficiency.

The *State Energy Efficiency Scorecard* ranks states on their policy and program efforts, and allows us to document best practices, recognize leadership, and provide examples for other states to follow. It serves as a benchmark for state efforts on energy efficiency policies and programs each year, encouraging states to continue strengthening efficiency commitments as a pragmatic and effective strategy for promoting economic growth and environmental benefits.

The *State Scorecard* builds on previous ACEEE research that focused on each state's spending on energy efficiency programs by utilities and the resulting energy savings. In 2007, ACEEE brought together this state-focused research and released *The State Energy Efficiency Scorecard for 2006* (Eldridge et al. 2007), which provided a comprehensive approach to scoring and ranking states on energy efficiency policies. Due to the broad interest in the 2007 report and the continued demand for a state-by-state comparison on energy efficiency, we have continued to update the report on an annual basis and present the *2013 State Energy Efficiency Scorecard* as its seventh edition.

The report has eight chapters. In Chapter 1, we discuss our methodology for scoring states (including changes made this year), present the overall results of our analysis, and provide several strategies states can use to improve their energy efficiency. Chapter 1 also highlights the leading states, most improved states, and other trends in state-level energy efficiency that were revealed by the rankings.

Following this, we present the detailed results for each policy area that we review. Chapter 2 covers utility and "public benefits" programs and policies. Chapter 3 discusses transportation policies. Chapter 4 deals with building energy codes, and has updated methodology scoring state code compliance efforts. Chapter 5 scores states on their friendliness toward CHP projects. Chapter 6 deals with state government initiatives, including financial incentives; "lead-by-example" policies; and research, development and demonstration. This year, the chapter also includes a new metric on energy disclosure policies. Chapter 7 covers appliance and equipment efficiency standards. Finally, Chapter 8 discusses areas for future research and offers our closing thoughts on the report's findings.

Chapter 1: Methodology & Results

Author: Annie Downs

SCORING

Each state has different policy and regulatory environments, and to reflect this diversity we chose metrics that are flexible enough to capture the range of policy and program options that states employ. The policies and programs scored in the *State Scorecard* aim to:

- Directly reduce end-use energy consumption
- Set long-term commitments to energy efficiency
- Establish mandatory performance codes and standards
- Accelerate the adoption of the most energy-efficient technologies
- Reduce market, regulatory, and information barriers to energy efficiency
- Provide funding for energy efficiency programs

Table 1 lists six of the primary policy areas in which states have historically pursued energy efficiency. These include utility and public benefits programs[1] and policies, transportation policies, building energy codes, policies encouraging CHP systems, state government-led initiatives around energy efficiency, and appliance and equipment standards.

Table 1 also lists the associated scoring metrics, which are weighted according to their potential energy savings (i.e., state policies likely to result in the highest energy savings have the highest maximum score). The weighting of each major policy area is the same as in last year's scoring and is based on several considerations: state and regional studies done by ACEEE that have identified the relative energy savings impacts from state-level policies (SWEEP 2007; Neubauer et al. 2009, 2011; Molina, Elliot et al. 2010; Molina et al. 2011) and the judgment of ACEEE staff and outside experts about the impact that state policies (versus federal or local policies) can have on improving energy efficiency in the sectors of the economy covered here.

Our allocation of points among the policy areas is designed to reflect the relative magnitude of energy savings possible through the measures scored. Specifically, the savings potential of utility and public benefits programs is approximately 40% of the total energy savings potential of all policy areas scored. Likewise, building energy codes could contribute, on average, about 15% of the total savings potential, and improved CHP policies about 10%. Therefore, we allocated 40% of the total 50 possible points, or 20 points, to utility and public benefits program and policy metrics; about 15% of the points, or seven (7) points, to building energy codes; and 10%, or five (5) points, to improved CHP policies. The other policy area points were estimated using the same methodology. The assignment of points across all areas was reviewed by expert advisors.

[1] A public benefits fund provides long-term funding for energy efficiency initiatives, usually through a small surcharge on electricity consumption by customers.

Table 1. Scoring by Policy Area and Categories

Policy Category & Subcategory	Maximum Score	% of Total Points
Utility and Public Benefits Programs and Policies	20	40%
Budgets for Electricity Efficiency Programs	5	10%
Budgets for Natural Gas Efficiency Programs	3	6%
Annual Savings from Electricity Efficiency Programs	5	10%
Annual Savings from Natural Gas Efficiency Programs	1	2%
Energy Efficiency Resource Standards (EERS)	3	6%
Performance Incentives and Fixed Cost Recovery	3	6%
Transportation Policies	9	18%
Greenhouse Gas Tailpipe Emissions Standards	2	4%
Integration of Transportation and Land Use Planning	2	4%
Targets to Reduce Vehicle Miles Traveled	2	4%
Transit Funding	1	2%
Transit Legislation	1	2%
Complete Streets Policies	0.5	1%
High-Efficiency Vehicle Consumer Incentives	0.5	1%
Building Energy Codes	7	14%
Level of Code Stringency	5	10%
Code Enforcement and Compliance	2	4%
Combined Heat and Power	5	10%
Interconnection Standard	1	2%
Treatment under Energy Efficiency Resource Standards (EERS)/Renewable Portfolio Standards (RPS)	1	2%
Financial Incentives	1	2%
Net Metering Rules	0.5	1%
Emissions Treatment	0.5	1%
Financing Assistance	0.5	1%
Additional Policy Support	0.5	1%
State Government Initiatives	7	14%
Financial Incentives	2.5	5%
Energy Disclosure Policies	1	2%
Lead-by-Example Efforts in State Facilities and Fleets	2	4%
Research and Development	1.5	3%
Appliance and Equipment Efficiency Standards	2	4%
Maximum Total Score	**50**	**100%**

Within each policy area, we developed a scoring methodology based on a diverse set of criteria, detailed in each policy chapter. Some changes have been made to our scoring methodology in several sections. These changes are outlined in the following section, as well as in the relevant chapters. Finally, we assigned a score for each state based on these criteria and informed by surveys sent to state energy officials, public utility commission staff, and experts in each policy area. To the best of our knowledge, policy information for the *2013 State Energy Efficiency Scorecard* is accurate as of the end of August 2013.

We do not envision that the allocation of points both across and within sectors will forever remain the same. We continue to adjust our methodology to reflect the current energy efficiency landscape. As new studies of the potential of energy efficiency potential measures emerge, and new policy designs are implemented, we will consider changing the allocation of points, adding or subtracting new metrics, or even eliminating entire categories of scoring, all with the goal of best representing states' evolving efforts to capture the potential for energy efficiency in the systems and sectors of their economies.

Changes in Scoring Methodology from Last Year

This year we updated the scoring methodology in three policy areas to better reflect potential energy savings, economic realities, and changing policy landscapes. In Chapter 2, Utility and Public Benefits Programs and Policies, as in the past, we scored states on budgets for electricity and natural gas programs. We found that the median budget for both electricity and natural gas efficiency programs had risen significantly this year, and leading states continued to raise the bar on efficiency program performance. The *State Scorecard* is designed to reflect those states that are pushing themselves to improve each year. As states continue to dedicate more resources to energy efficiency, the boundaries of cost-effective energy efficiency continue to shift upward. To reflect the increase in planned efficiency expenditures, we increased the threshold required to earn the maximum points for electric and natural gas program budgets. Similarly, we increased the stringency of our scoring for electricity savings, reflecting states' rising savings targets as many states ramp up their efficiency programs. Notably, we have also scored natural gas efficiency program savings for this first time this year. Though data on these programs is not yet comprehensive, natural gas programs make up a growing portion of efficiency portfolios. We have attempted to reflect this in our scoring, allocating one point for natural gas savings. Last year, we included data collected directly from municipal utilities and rural electricity cooperatives. This data collection effort resulted in only minor changes to our data set and was a significant undertaking, and so was not included in this year's report. A large portion of these efficiency activities are picked up in our review nonetheless, as EIA data typically include data reported by these smaller utilities.

We have adjusted our scoring criteria for building energy codes in Chapter 4 to reflect ACEEE's increased effort in data collection on compliance activities. As in the past, five (5) points were allocated for building code stringency. This year, the remaining two (2) points in this policy area were awarded for specific compliance activities, including policy drivers for compliance, such as a strategic compliance plan, and performance metrics, such as completion of a baseline study, presence of an active stakeholder advisory group, and utility involvement in compliance.

In Chapter 6, State Government–Led Initiatives, we included an additional category for laws requiring disclosure of buildings' energy use. In the past, we scored disclosure laws in combination with financial incentives for energy efficiency. This year, we chose to give greater focus to disclosure policies, which studies have linked to significant decrease in building energy usage and with other benefits such as improved market transparency and competitiveness (EPA 2012, Burr et al. 2012). To account for an increased emphasis on building energy disclosure, some reallocation of points within this chapter was necessary. One (1) point was awarded to states with commercial and residential disclosure rules. States could receive up to two and one-half (2.5) points for customer financial incentive programs. Data on research and development at the state level are inconsistent, so we removed one-half (0.5) point from this category, now awarding states with at least three research and development programs one and one-half (1.5) points.

State Data Collection and Review

We continue to improve our outreach to state-level stakeholders to verify the accuracy and comprehensiveness of the policy information on which we score the states. As in past years, we asked each state utility commission to review spending and savings data for customer-funded energy efficiency programs presented in Chapter 2. Forty-three states responded, an improvement over the 36 responses last year. We also asked each state energy office to review information on transportation policies (Chapter 3), building energy codes (Chapter 4), and state government-led initiatives (Chapter 6). We received responses from 47 state energy offices (more than double the number of responses we received in past years). In addition, state energy office and utility commission officials were given the opportunity to review the material in ACEEE's State Energy Efficiency Policy Database (ACEEE 2013). These state officials were also given the opportunity to review and provide comments on a draft of the *2013 State Energy Efficiency Scorecard* prior to publication.

This year, we continued our attempts to improve the data we present on energy efficiency spending by utilities and efficiency program administrators by gathering data on actual spending in 2012 for both electricity and natural gas efficiency programs. While several states were able to supply this data point, we did not receive enough responses to draw comparisons among states. We also continued to solicit natural gas savings data from states. Although we did not receive responses from every state regarding natural gas spending, we felt that this year we had sufficient data to include savings from these programs in our scoring. The data are presented in Chapter 6. Additional utility spending and savings data collected through our survey of state officials is also presented in Appendix H.

For the first time, we conducted a survey of state agricultural offices to collect data on energy efficiency programs focused on the agricultural sector. We received 11 responses and found that many agricultural energy programs were intertwined with other comprehensive energy efficiency programs run through state energy offices. Due to the limited responses we received, we did not include the data we collected on agricultural energy efficiency in our *2013 State Scorecard*, but case studies are presented in Figure 10 in Chapter 6.

Data Limitations

The *State Scorecard* reflects state-level energy efficiency policy environments as well as states' performance in implementing programs. We have generally not included the energy

efficiency initiatives implemented by actors at the federal or local level or in the private sector (with the exception of investor-owned utilities and CHP facilities). Regions, counties, and municipalities have become very active in energy efficiency program development, a trend that we do not track in the *State Scorecard* but a positive development that should reinforce the energy efficiency efforts taking place at the state level. A few metrics in the *State Scorecard* do capture non-state efforts, such as local enforcement of building codes, local land use policies, and state financial incentives aimed at local energy efficiency efforts. As much as possible, however, we aim to focus specifically on state-level energy efficiency activities. Data on local energy efficiency efforts are captured in ACEEE's *City Energy Efficiency Scorecard* (Mackres et al. 2013).

Private-sector investments in efficient technologies outside of customer-funded or government-sponsored energy efficiency programs are also not covered in the *State Scorecard.* While utility and public programs are critical to leveraging private capital, the development of an independent metric measuring private sector investment falls outside the scope of this report.

"Best Practice" Policy and Performance Metrics

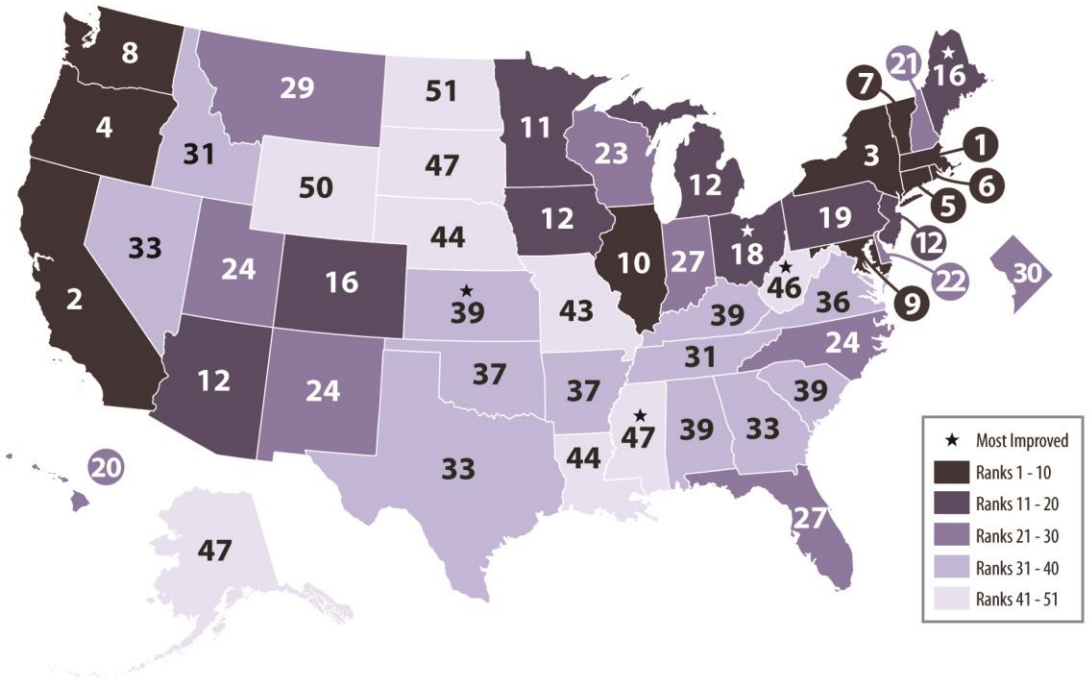
The scoring framework described above is our best attempt to represent the myriad efficiency metrics as a quantitative "score." There are clear limitations to converting spending data, energy savings data, and policy adoption metrics across six policy areas into one score. Quantitative energy savings performance metrics are confined mostly to efficiency with regard to electricity. Even other programs with measured savings, such as natural gas programs, pose difficulty Due to data lags, both natural gas and electricity efficiency performance metrics reflect activity in 2011 and 2012 rather than 2013. More current—although not always comprehensive—data are available for some states. These data are presented in Appendix H.

With the exception of utility policies, we have not scored energy efficiency policy areas on reported savings or spending data attributable to a particular policy action, and instead we have developed "best practice" metrics according to which to score the states. While these metrics do not score outcomes directly, they credit states that are implementing policies likely to lead to more energy-efficient outcomes. For example, *potential* energy savings from improved building energy codes and appliance efficiency standards have been documented, although *actual* savings from these policies are rarely evaluated. Therefore, we have relied on "best practice" metrics for building energy codes; in the case of building energy codes, we ranked states according to the level of stringency of their residential and commercial codes. Full discussions of the policy and performance metrics used can be found in each chapter.

2013 State Energy Efficiency Scorecard Results

The results of the *State Scorecard* are presented in Figure 1 and more fully described in Table 2. We then present some key highlights of changes in state rankings, discuss which states are making notable new commitments to energy efficiency, and provide a series of recommendations for states wanting to increase their energy efficiency.

Figure 1: 2013 State Scorecard Rankings Map



How to Interpret Results

Although we provide individual state scores and rankings, the differences between states are most instructive in tiers of ten. The difference between states' total scores in the middle tiers of the *State Scorecard* is small: only 4.5 points separate the states in the second tier; 6 points in the third tier; and 2 points in the fourth tier. For the states in these three tiers, small improvements in energy efficiency will likely have a significant effect on their rankings. Conversely, idling states will easily fall behind as other states in this large group ramp up efficiency efforts.

The top tier, however, exhibits more variation in scoring (with a 16-point range), representing more than one-third of the total variation in scoring among all the states. Massachusetts and California continued to score significantly higher than most other states and retained their spots at the top, despite our several methodological changes this year. Other states in the top ten are separated by only a few points – New York, ranked third, and Washington, ranked eighth, fall within 4.5 points of each other. All of the states in the top tier have made broad, long-term commitments to energy efficiency, indicated by their having remained at the top of the *State Scorecard* over the past seven years. Notably, the top tier did see some significant movement this year, with Connecticut moving back into the top five, and Illinois breaking into the top ten for the first time. Details on leading states are discussed further below.

2013 Leading States

Massachusetts retained the top spot in the *State Energy Efficiency Scorecard* rankings for the third year in a row, having overtaken California in 2011, based on its continued commitment to energy efficiency under its Green Communities Act of 2008. The legislation laid the foundation for greater investments in energy efficiency programs by requiring gas and electric utilities to save a large and growing percentage of energy every year through energy efficiency. In late 2012, Massachusetts finalized its three-year plan, setting annual electricity savings targets of 2.5–2.6% through 2015 and natural gas targets of 1.08–1.19% per year through 2015 (State of Massachusetts 2012). These are some of the most ambitious savings targets in the country, helping Massachusetts to earn the highest score in the utilities section of this year's *State Scorecard*.

Massachusetts also leads in other areas of the *State Scorecard*, including its commitment to reducing energy use in state buildings and fleets, and its policies to create a supportive environment for the development of CHP facilities in the state.

California was another truly leading state, following closely behind Massachusetts. New York, Oregon, Connecticut, Rhode Island, Vermont, and Washington were each separated by a point or less, showing that the top ten is increasingly dynamic, and many states have the potential to achieve the top rank. This is reflected in their standing in the *State Scorecard* over the past seven years, as listed in Table 3.

Table 3 shows the number of years that states have been in the top five and top ten spots in the *State Scorecard* rankings since 2007. In total, six states have occupied the top five spots, and 14 have appeared somewhere in the top ten. Both California and Oregon have been in the top five spots all seven years, followed by Massachusetts and New York for six years, Vermont for five years, and Connecticut for four. Rounding out the top 10 are Washington, which has been included in the top ten for all seven years; Maryland for three years; and Maine and New Jersey twice. Illinois earned a top ten spot for the first time this year, while Minnesota did not place in the top ten this year for the first time. Wisconsin was included in the top ten once, in 2008. All 14 of these states have made broad, long-term commitments to energy efficiency in the past, and most continue to do so. In recent years, however, that commitment has wavered in New Jersey, Wisconsin, and Maine; among other actions, they have not allocated budgets for energy efficiency at the same levels as in the past. In 2013, Maine re-authorized and expanded funding for its energy efficiency programs, pushing it significantly higher up in the rankings, although not high enough to put it in the top ten.

Table 2. Summary of State Scores

Rank	State	Utility & Public Benefits Programs & Policies (20 pts.)	Trans-portation Policies (9 pts.)	Building Energy Codes (7 pts.)	Combined Heat & Power (5 pts.)	State Government Initiatives (7 pts.)	Appliance Efficiency Standards (2 pts.)	**TOTAL SCORE (50 pts.)**	Change in rank from 2012	Change in score from 2012
1	Massachusetts	19	7.5	5.5	4.5	5.5	0	**42**	0	-1.5
2	California	15	7.5	7	3	6.5	2	**41**	0	0.5
3	New York	16	8	5.5	2.5	6	0	**38**	0	-1
4	Oregon	14.5	7	5.5	3.5	5.5	1	**37**	0	-0.5
5	Connecticut	14	5.5	5.5	4	6	1	**36**	1	1.5
6	Rhode Island	18.5	5.5	6	2	3	0.5	**35.5**	1	2.5
7	Vermont	18.5	4.5	5.5	2	4	0	**34.5**	-2	-1
8	Washington	13	7	6	2.5	4.5	0.5	**33.5**	0	1.5
9	Maryland	8.5	6	5.5	2	5	0.5	**27.5**	0	-2.5
10	Illinois	9.5	4	5.5	2	5	0	**26**	4	1
11	Minnesota	15	2	3	1	4.5	0	**25.5**	-2	-4.5
12	New Jersey	8.5	6	4	2.5	3.5	0	**24.5**	4	0
12	Arizona	12	2.5	3.5	2.5	3.5	0.5	**24.5**	0	-1
12	Michigan	11	3	4	2	4.5	0	**24.5**	0	-1
12	Iowa	12	2	5.5	1.5	3.5	0	**24.5**	-1	-2
16	Maine	10.5	6	2.5	2	2	0	**23**	9	4
16	Colorado	10.5	2	4.5	1.5	4.5	0	**23**	-2	-2
18	Ohio	11	0	4	3.5	4	0	**22.5**	4	3
19	Pennsylvania	6	6	4	1.5	4.5	0	**22**	1	0.5
20	Hawaii	10	2.5	4	0.5	3.5	0	**20.5**	-2	-1.5
21	New Hampshire	8.5	1	4.5	1.5	4	0.5	**20**	-3	-2
22	Delaware	2.5	5.5	4.5	1.5	4.5	0	**18.5**	5	0
23	Wisconsin	7.5	1	3.5	2	4	0	**18**	-6	-4.5
24	New Mexico	7	2	4	1.5	3	0	**17.5**	3	-1
24	North Carolina	4.5	2.5	4	2	4.5	0	**17.5**	-2	-2
24	Utah	7.5	0.5	4.5	1.5	3.5	0	**17.5**	-3	-2.5
27	Indiana	8.5	0	3.5	1.5	2	0	**15.5**	6	1.5
27	Florida	2.5	4.5	4.5	1	3	0	**15.5**	2	-2
29	Montana	6	1	4	0.5	3.5	0	**15**	-4	-4
30	District of Columbia	3.5	3.5	3.5	1	2	0.5	**14**	-1	-3.5
31	Tennessee	2	2.5	2.5	1	5.5	0	**13.5**	1	-1.5
31	Idaho	5.5	0	4.5	0	3.5	0	**13.5**	-9	-6
33	Georgia	1.5	3	4	0.5	3.5	0.5	**13**	0	-1
33	Texas	2	1	4	2	3.5	0.5	**13**	0	-1
33	Nevada	5	0	4.5	1	2.5	0	**13**	-2	-3.5
36	Virginia	1	2.5	4	0.5	4.5	0	**12.5**	1	-0.5
37	Oklahoma	4	0.5	4	0	3.5	0	**12**	2	1
37	Arkansas	6	0	3.5	0.5	2	0	**12**	0	-1
39	Kansas	0.5	1	4	1	5	0	**11.5**	6	3
39	Alabama	2.5	0	4	0.5	4.5	0	**11.5**	1	1
39	South Carolina	3	1	4	0.5	3	0	**11.5**	1	1
39	Kentucky	3.5	0	3.5	0	4.5	0	**11.5**	-3	-2
43	Missouri	4	0	3	0.5	3	0	**10.5**	0	1.5
44	Louisiana	2.5	1	3.5	0.5	2	0	**9.5**	-1	0.5
44	Nebraska	1	0	5	0	3.5	0	**9.5**	-2	0
46	West Virginia	1	1.5	4	1	1.5	0	**9**	3	3
47	Mississippi	1	0.5	3	0	3.5	0	**8**	4	5.5
47	Alaska	0	1	1.5	0.5	5	0	**8**	-1	0
47	South Dakota	4	0	1	1	2	0	**8**	-1	0
50	Wyoming	2	0	2	0	1.5	0	**5.5**	-2	-1
51	North Dakota	0.5	1	1.5	0.5	0	0	**3.5**	-1	-0.5

Table 3. Leading States in the State Scorecard, by Years at the Top

State	Year in Top 5	Years in Top 10
California	7	7
Oregon	7	7
Massachusetts	6	7
New York	6	7
Vermont	5	7
Connecticut	4	7
Washington	0	7
Minnesota	0	6
Rhode Island	0	6
Maryland	0	3
Maine	0	2
New Jersey	0	2
Wisconsin	0	1
Illinois	0	1

Changes in Results Compared to the *2012 State Energy Efficiency Scorecard*

Changes in states' overall scores this year compared to previous *State Scorecards* are a function of both changes in states' efforts to improve energy efficiency and changes to our scoring methodology. As a result, comparisons to last year's rankings cannot be understood as solely due to changes in states' efforts *per se*. Because of the number of metrics covered in the *State Scorecard* and states' differing efforts, relative movement among the states should be expected.

Table 4 presents the results of the *2013 State Energy Efficiency Scorecard* compared to last year, by policy area and direction of change. Overall, 17 states gained points and 29 states lost points compared to last year, with five states having no change in score.[2] Many of these changes in points awarded are due to methodological changes, and the number of states losing points should not be interpreted as a sign that states are necessarily losing ground. For example, Massachusetts, the top performing state for three years in a row, continued to push forward its energy efficiency policies and programs, but nonetheless scored fewer points overall. This point deduction does not reflect a diminished effort. Rather, we have raised the bar, awarding points for more ambitious programs and policies.

[2] The *State Scorecard* looks at all 50 states and the District of Columbia, which, while not a "state," is grouped under that heading for convenience.

Table 4. Number of States Gaining or Losing Points Compared to 2012, by Policy

Policy Category	States Gaining Points		No Change		States Losing Points	
Utility & Public Benefits	10	20%	6	12%	35	69%
Transportation	19	37%	29	57%	3	6%
Building Energy Codes	24	47%	14	27%	13	25%
Combined Heat and Power	11	22%	25	49%	15	29%
State Gov't Initiatives	15	29%	18	35%	18	35%
Appliance Standards	1	2%	50	98%	0	0%
Total Score	17	33%	5	10%	29	57%

The landscape for energy efficiency is clearly in constant flux and many opportunities for states to lead the way in energy efficiency remain. Last year, our updated scoring methodology suggested the most room for improvement existed in CHP. This year, we have again made changes to our methodology to reflect the deeper savings states are realizing—and will continue to realize—through energy efficiency programs delivered to utility customers. States have made significant efforts over the past year in utility policies and programs and state government initiatives. For example, in 2012 national spending by utilities on natural gas efficiency programs totaled $1.3 billion, an 18% increase over the previous year. Savings from electric efficiency program in 2011 totaled approximately 22.8 million MWh, a 20% increase over a year earlier.

This year, 35 states lost points in Chapter 2, Utility and Public Benefits Programs and Policies, while only ten gained points. This overall decrease in points awarded does not reflect diminished effort on the part of most states. While several states did backslide in terms of policy, most continued to make progress. Rather, this overall loss in points reflects the fact that we were significantly more stringent in our scoring of utility energy efficiency program spending and savings. The increased stringency is an accurate reflection of the direction many states are moving, but is nonetheless forward thinking. Several states that scored top marks in these metrics in the past did not receive full points this year, despite achieving similar levels of savings. However, energy savings targets and multi-year plans suggest that more states will receive full points in the future as their efficiency programs expand.

Our updated scoring of building code stringency and compliance affected several states, particularly those with stringent codes but limited compliance activities. Thirteen states lost points in the building codes category, while 24 jumped ahead. Only one state, California, earned full credit for code compliance programs and policies. It is relatively easy for states to fall behind in terms of scoring of building codes, since these policies require continual updating.

In Chapter 6, State Government–Led Initiatives, a large number of states lost points due to our increased focus on building energy use disclosure laws and de-emphasis of state-led research and development programs. Changes to other chapters of the *State Scorecard* were slight, and so the amount of movement in those chapters is more closely tied to policy development (or lack thereof).

"Most Improved" States

Nineteen states rose in the rankings this year, and while all should be applauded, several states saw a notable increase in overall points earned compared to last year. In order to be considered for "most improved" status, a state needed to have increased in points (reflecting their efforts this year relative to last) as well as rank (reflecting their efforts relative to other states) when compared to the *2012 State Energy Efficiency Scorecard*. States that increased in rank but did not earn additional points were not considered, nor were states that increased in points but not rank.

This year's most improved states were Mississippi, Maine, Kansas, Ohio, and West Virginia. Maine and Kansas made significant jumps up the ranking in addition to their increase in score. Mississippi made a slightly smaller gain in rank but gained more points than any other state compared to last year. Ohio and West Virginia each earned three additional points compared to last year and pushed themselves upward in ranking.

Table 5. Changes in Score and Rank Compared to 2012 for Most-Improved States

	Change in Score	Change in Rank	2013 Ranking
Mississippi	+5.5	+4	47
Maine	+4	+9	16
Kansas	+3	+6	39
Ohio	+3	+4	18
West Virginia	+3	+3	46

Though the *State Scorecard* places significant emphasis on utility-sector programs and policies, these states have made strides in many policy areas. In 2013, the Mississippi legislature passed laws setting a mandatory energy code for commercial and state-owned buildings (ASHRAE 90.1-2010). The state is working with local jurisdictions and code officials to implement the new standard and ensure compliance. Mississippi has also formed the Building Energy Code Collaborative, a stakeholder group that meets quarterly to implement code training and enforcement activities. The state also began to implement enhanced lead-by-example programs for state agencies, including developing energy savings targets for public buildings and efficiency goals for state fleets. Due to these lead-by-example programs and building code improvements, Mississippi more than tripled its score from 2012 to 2013, moving off the bottom of the *State Scorecard* rankings.

The most dramatic change in ranking in this year's *State Scorecard* was Maine, where legislation passed in June 2013 re-allocated and expanded funding to Efficiency Maine for implementation of energy efficiency programs. In the *2012 Scorecard*, Maine fell 13 spots, due in large part to the state legislature's decision not to fully fund its third-party efficiency program administrator. The recent decision of legislators to override the governor's veto of an omnibus energy bill has restored Maine nearly to its previous ranking in the *Scorecard* – an increase of nine places from last year. Maine also set targets for vehicle miles traveled this year, significantly increasing its score in the transportation section of the *Scorecard*.

Kansas made great progress in the rankings this year due to the adoption of more stringent building codes by the majority of the state's jurisdictions. To continue its upward climb in

the *State Scorecard*, Kansas will need to expand its energy efficiency programs to other policy areas, most notably the utility sector.

Ohio more than doubled its electricity savings between 2010 and 2011, allowing the state to earn significantly more points in Chapter 2 of this year's *State Scorecard*. Despite political pushback targeted at the state's energy efficiency resource standard, Ohio has consistently surpassed its electricity savings targets. Opposition to energy efficiency policies continues in Ohio, and the events of the next year will be critical in determining the future of energy efficiency within the state.

This year is the first year West Virginia has reported budgets for electricity efficiency programs, and the state's pending performance incentive for electric utilities suggests that spending on efficiency programs will continue to rise. West Virginia has also made other notable policy improvements over the past year, passing Complete Streets legislation and implementing more efficient building energy codes.

Other states have also made recent efforts related to energy efficiency. Arkansas, Indiana, Illinois, and Pennsylvania continue to reap the benefits of their EERS policies, which led to substantially higher electricity efficiency program spending and savings compared to what we reported in last year's *State Scorecard*. Connecticut also passed a major energy bill in June 2013 calling for benchmarking of state buildings, expanding CHP programs, and doubling funding for efficiency programs.

States Losing Ground

Twenty-nine states lost points this year, due to several factors—changes to the scoring methodology in several of our policy areas (utilities, state-led initiatives, and building codes) and to relatively faster progress by other states. Here we can see the complex relationship between changes in total score and changes in rank. Of the 29 states that lost points overall compared to last year, 16 fell in the rankings. The rankings of nine others did not change, and four states were able to increase their rank despite a loss in points. Meanwhile one state—Louisiana—that gained points compared to last year, nonetheless dropped in the rankings. Because of the number of metrics covered in the *State Scorecard* and states' differing efforts, relative movement among the states should be expected. As mentioned earlier, the difference among states' total scores in the second, third, and fourth tiers of the *State Scorecard* is small, meaning that idling states will easily fall behind as others ramp up efforts to become more energy efficient.

Table 6. Changes in Score and Rank Compared to 2012 for States Losing Ground

	Change in Score	Change in Rank	2013 Ranking
Idaho	-6	-9	31
Minnesota	-5	-2	11
Wisconsin	-4.5	-6	23

For example, Minnesota earned fewer points than last year, losing four and one-half points. Minnesota's score suffered from the methodological changes made in the Utilities and

Public Benefits Policies and Programs this year. Despite the drop in score, the state continued to report high levels of electricity and natural gas savings.

However, many states lost ground due to changes in efficiency implementation. Wisconsin also lost four and one-half points this year, causing it to drop in the rankings by six spots compared to the *2012 State Energy Efficiency Scorecard*. This change in rank was due mainly to a significant drop in performance by the state's public benefits programs. 2012 was a transition year for Wisconsin's third-party efficiency program administrator, and the change resulted in far lower spending and savings than in past years.

Idaho fell the furthest in the rankings, by nine spots this year, largely because it did not keep up with peer states in utility spending and savings. Spending on electric efficiency programs, while still fairly high, fell from 2.67% of revenues to 2.39%. The state's budget for natural gas efficiency programs also dropped, from $2.2 million in 2011 to $1.9 million in 2012.

STRATEGIES FOR IMPROVING ENERGY EFFICIENCY

No state received the full 50 points in the *2013 State Energy Efficiency Scorecard*, reflecting the fact that there are a wide range of opportunities in all states—including leading states—to improve energy efficiency. For states wanting to improve their standing in the *State Scorecard* and, more importantly, wanting to capture greater energy savings and the concomitant public benefits, we offer the following recommendations from among the metrics that we track:

Put in place, and adequately fund, an energy efficiency resource standard or similar energy savings target. These policies establish specific energy savings targets that utilities or independent statewide program administrators must meet through customer energy efficiency programs, and serve as an enabling framework for cost-effective investment, savings, and program activity that, as seen in many of the leading states, can have a catalytic effect on increasing energy efficiency and its associated economic and environmental benefits. The long-term goals associated with an EERS send a clear signal to market actors about the importance of energy efficiency in utility program planning, creating a level of certainty that encourages large-scale, productive investment in energy efficiency technology and services. Long-term energy savings targets require leadership, sustainable funding sources, and institutional support to deliver on their goals. See Chapter 2 for further details.

Examples: Massachusetts, Arizona, Hawaii, Vermont

Adopt updated, more stringent building energy codes; improve code compliance; and enable the involvement of efficiency program administrators in code support. Buildings consume more than 40% of total energy in the United States, making them an essential target for energy savings. Mandatory building energy codes are one way to ensure a minimum level of energy efficiency for new residential and commercial buildings. Model codes are only as effective as the level to which they are implemented, however, and improved compliance activities, including training and code compliance surveys, are increasingly important. Another emerging policy driver for capturing energy savings from

codes is enabling involvement of utility and program administrators in compliance activities. See Chapter 4 for further details.

Examples: California, Rhode Island, Illinois, Mississippi

Adopt stringent tailpipe emissions standards for cars and trucks, and set quantitative targets for reducing vehicle miles traveled. Like buildings, transportation consumes a substantial portion of total energy in the United States. States that have adopted California's stringent tailpipe emissions standards (which will yield major reductions in energy use) will help to bring advanced vehicle technologies into the market and to ensure continuing progress on federal fuel economy standards. Codified targets for reducing vehicle miles traveled (VMT) are an important step towards states achieving substantial reductions in energy use and certain pollutants. See Chapter 3 for further details.

Examples: California, New York, Massachusetts, Oregon

Treat combined heat and power as an energy efficiency resource equivalent to other forms of energy efficiency. Several states list CHP as an eligible technology within their Energy Efficiency Resource Standard or Renewable Portfolio Standard, but relegate it to a bottom tier, letting other renewable technologies and efficiency resources take priority within the standard. ACEEE recommends that CHP be given equal footing, which does require that the state develop a specific methodology for counting CHP savings. If CHP is allowed as an eligible resource, target levels should take into account CHP potential. Massachusetts has accomplished this in their Green Communities Act.

Example: Massachusetts

Expand and make visible state-led efforts, such as funding for energy efficiency incentive programs, benchmarking requirements for state building energy use, and investments in energy efficiency-related research and development centers. State-led initiatives complement the existing landscape of utility programs, leveraging resources from the state's public and private sectors to generate energy and cost savings that benefit taxpayers and consumers. States have many opportunities to "lead by example," including reducing energy use in public buildings and fleets, enabling the market for energy service companies (ESCOs) that finance and deliver energy-saving projects, and funding research centers that focus on energy-efficient technology breakthroughs. See Chapter 6 for further details.

Examples: New York, Maryland, Alaska

Chapter 2: Utility and Public Benefits Programs and Policies

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INTRODUCTION

The utility sector is critical to the implementation of energy efficiency throughout the economy, as electric and natural gas utilities and independent statewide program administrators deliver a substantial share of U.S. electricity and natural gas efficiency programs.[3] Utility customers fund these programs, either through utility rates or statewide "public benefits funds." Utilities and independent statewide program administrators in some states have been delivering energy efficiency programs for decades, driven by regulation from state utility commissions, offering various efficiency services for residential, commercial, industrial, and low-income customers.[4] Today, utilities in 48 states and the District of Columbia implement energy efficiency programs.[5] Utilities' approaches to delivering energy efficiency may include financial incentives such as rebates and loans, technical services such as audits and retrofits, and educational campaigns about the benefits of energy efficiency improvements. In addition to these common approaches, utilities and independent program administrators continually develop new and creative ways of delivering energy efficiency to their customer bases.

This chapter reviews and ranks the states based on their performance in implementing utility-sector efficiency programs and enabling policies that are evidence of states' commitment to energy efficiency. The six subsets of scoring in this chapter are:

- Utilities' electricity program budgets as a percentage of statewide utility revenues
- Utilities' natural gas program budgets per residential natural gas customer
- Incremental electricity program savings as a percentage of retail sales[6]
- Incremental natural gas program savings as a percentage of residential and commercial sales
- States' enabling policies such as energy efficiency resource standards
- Financial incentives for utilities, including performance incentives and mechanisms for addressing lost revenue

Electricity and Natural Gas Efficiency Program Budgets

The structure and delivery of customer-funded electric energy efficiency programs have changed dramatically over the past two decades, mostly in conjunction with restructuring efforts.[7] In the 1980s and 1990s, such programs were almost exclusively the domain of utilities, which administered and implemented programs under regulatory oversight.

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[3] The other major programs are run by state governments and are discussed in Chapter 6.

[4] For more information on the historical growth of utility energy efficiency programs, see ACEEE's *Three Decades and Counting: A Historical Review and Current Assessment of Utility Energy Efficiency Activity in the States* (York et al. 2012).

[5] Alaska and North Dakota report no spending on electric efficiency programs.

[6] Incremental annual savings represent new savings from programs in each program cycle, while cumulative savings represent all savings accrued over the life of a particular program.

[7] By "customer-funded energy efficiency" programs—also known as "ratepayer-funded energy efficiency" programs, we mean energy efficiency programs funded through charges wrapped into customer rates or as some type of charge on customer utility

Efforts in the mid-1990s to restructure and deregulate the electric utility markets led numerous states to put in place "public benefits" charges as a new source of funding for efficiency programs. These public benefits programs established new structures and, in some cases, tasked organizations other than public utilities with the responsibility of administering and delivering energy efficiency and related energy programs (including energy programs for low-income customers and renewable energy programs).[8]

Not all public benefits programs are administered or delivered by non-utility organizations, however. In many cases, funds from a public benefits program go to a state's utilities to administer and implement energy efficiency programs themselves. Thus, while there have been changes in funding and administrative structures for customer programs over the past 20 to 30 years, utilities are still the primary administrator of such programs on a national basis.

Despite the enactment of public benefits programs in many states, restructuring resulted in a precipitous decline in funding for customer-funded electricity energy efficiency programs, from almost $1.8 billion in 1993 to about $900 million in 1998 (nominal dollars). The principal reasons for this decline included utilities' uncertainty about newly restructured markets and the expected loss of cost recovery mechanisms for their energy efficiency programs.[9] Generally, utilities did not see customer-funded energy efficiency programs as being compatible with competitive retail markets.

After restructuring efforts slowed in some states over the past decade, utility commissions have placed renewed focus and importance on energy efficiency programs. From its low point in 1998, spending for electricity programs increased five-fold by 2010, from approximately $900 million to $4.6 billion. And in 2012, total budgets for electricity efficiency programs reached $5.9 billion. Adding this to natural gas program budgets of $1.3 billion, we estimate total efficiency program budgets of $7.2 billion in 2012 (see Figure 2).

Given states' increasing commitments to energy efficiency, this growth will likely continue over the next decade. In one analysis of customer-funded energy efficiency program budgets, funding for electric and natural gas programs is estimated to more than double from 2010 levels to $10.8 billion by 2025, if current savings targets are met, and more than triple to $16.8 billion if states give energy efficiency a prominent role as an energy resource (Goldman et al. 2012). A follow-up study predicts a slightly more modest, although still significant, increase in funding—rising to $15.6 billion by 2025 due to the impact of all cost-effective efficiency policies in leading states, successful achievement of EERS targets, and peer learning (Barbose et al. 2013). These analyses also suggest a significant broadening of the U.S. energy efficiency market, with a large portion of the projected increases in spending

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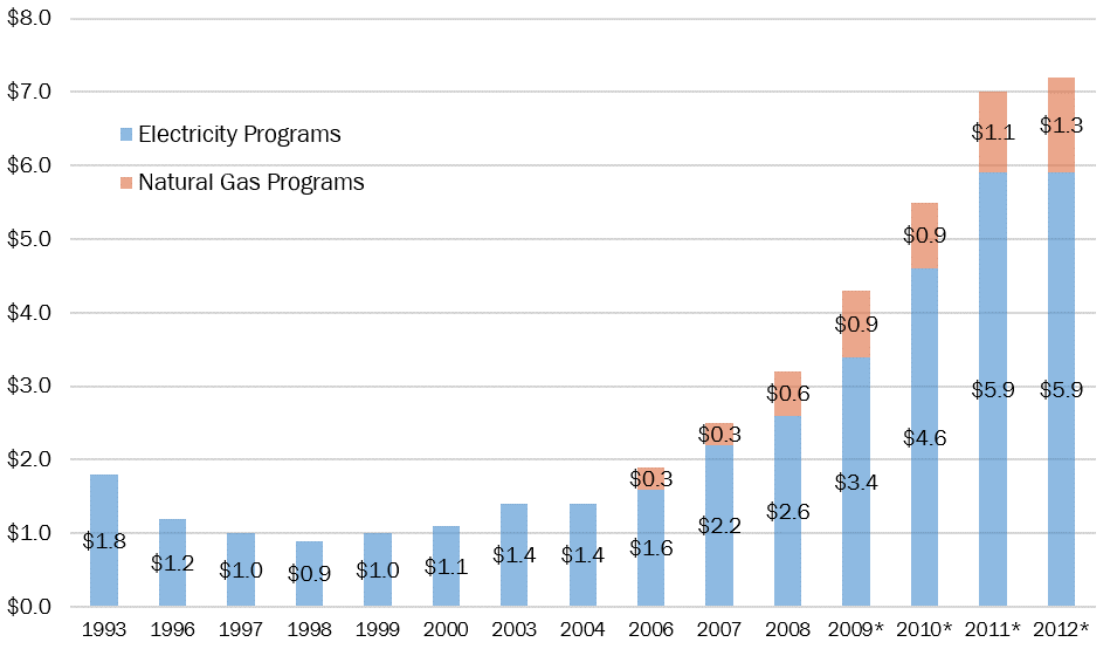
bills. This includes both utility-administered programs and public benefits programs administered by other entities. We do not include data on separately funded low-income programs, load management programs, or energy efficiency research and development.

[8] States that have established non-utility administration of efficiency programs include Vermont, New York, Oregon, Wisconsin, Delaware, New Jersey, Maine, and the District of Columbia.

[9] Under traditional regulatory structures, utilities do not have an economic incentive to help their customers become more energy efficient because their revenues and profits fall in line with falling energy sales from energy efficiency programs. To address this disincentive, state regulators allow utilities to recover, at a minimum, the costs of running energy efficiency programs through charges on customer bills.

coming from states in the Midwest and South that historically had relatively low levels of funding for energy efficiency.

Figure 2. Annual Electric and Natural Gas Energy Efficiency Program Spending or Budgets



* From 1993–2008, values represent actual program spending (including customer-funded programs); from 2009 on, they represent program budgets. Natural gas spending is not available for the years 1993–2004. Sources: Nadel et al. (2000); York and Kushler (2002, 2005); Eldridge et al. (2008, 2009); Molina, Neubauer et al. (2010); Sciortino, Neubauer et al. (2011); Foster et al. (2012)

Savings from Electric Efficiency Programs

We assessed the overall performance of electricity energy efficiency programs by the amount of reported electricity saved. Utilities and non-utility program administrators pursue numerous strategies to achieve energy efficiency savings. Program portfolios may initially concentrate on the low-hanging fruit such as energy-efficient lighting and appliances. As utilities gain experience and customers become aware of the benefits of energy efficiency, the number of approaches available to efficiency program portfolios increases. Utilities calculate the energy savings that occur from the programs, which are then subject to internal or third-party evaluation, monitoring, and verification (EM&V), and are typically reported to the public utility commission on a semi-annual or annual basis.

In states ramping up funding levels in response to aggressive energy efficiency resource standards, programs will necessarily shift focus from "widget-based" approaches (e.g., installing a new, more efficient water heater) to more comprehensive deep savings approaches, which seek to generate more energy efficiency savings per program participant by, instead of installing a single piece of equipment, conducting whole-building or system

retrofits. Some deep savings approaches also draw on savings from complementary efficiency efforts, such as the enforcement of building energy codes.[10] Deep savings approaches may also add to the emphasis on whole-building retrofits and comprehensive changes in systems and operations by including behavioral elements that empower customers with contextual information on energy use.

Energy Efficiency Resource Standards

States' enabling policies such as EERS and their financial incentives for utilities (see the next section) are critical to leveraging energy efficiency funding and encouraging savings over the near and long term. Twenty-six states now have fully funded EERS that establish specific energy savings targets that utilities or independent statewide program administrators must meet through customer energy efficiency programs. These policies set multi-year targets for electricity or natural gas savings, such as 1% or 2% incremental savings per year or 20% cumulative savings by 2025.[11]

EERS policies aim explicitly for quantifiable energy savings, reinforcing the idea that energy efficiency is a utility system resource on par with supply-side resources. These standards also help utility system planners more clearly anticipate and project the impact of energy efficiency programs on utility system loads and resource needs. Energy savings targets are generally set at levels that push efficiency programs to achieve higher savings than they otherwise would have, typically based on analysis of the energy efficiency savings potential in the state that ensures the targets are realistic and achievable. EERS policies maintain strict requirements for cost-effectiveness so that efficiency programs are guaranteed to provide overall benefits to customers. And these standards help to ensure a long-term commitment to energy efficiency as a resource, building essential customer engagement as well as the workforce and market infrastructure necessary to sustain the high levels of savings.[12]

EERS policies encompass three distinct approaches to achieving a single outcome—binding, long-term targets for energy efficiency savings from utility programs (Sciortino, Nowak et al. 2011). ACEEE considers states that implement any of the following three approaches to have an energy efficiency resource standard:

1. Statewide explicit EERS
2. Long-term energy savings targets set by utility commissions and tailored to individual utilities or statewide independent administrators
3. Energy efficiency incorporated as an eligible resource in a RPS

While the latter two options may not technically be a "standard" in the traditional sense, ACEEE has defined all three approaches as an EERS to highlight the key similarity of all these policies—establishing binding, long-term energy savings targets. Table 7 describes key distinctions among these three policies and identifies the states that utilize them.

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[10] See ACEEE's *Energy Efficiency Resource Standards: Strategies for Higher Savings* (Nowak et al. 2011) for a full discussion on this topic.

[11] "Multi-year" is defined as three or more years. EERS policies may set specific targets as a percentage of sales, as specific GWh energy savings targets without reference to sales in previous years, or as a percentage of load growth.

[12] ACEEE's *Energy Efficiency Resource Standards: A Progress Report on State Experience* analyzed current trends in EERS implementation and found that most states were meeting or were on track to meet energy savings targets (Sciortino et al. 2011).

Table 7. Key Distinctions of Energy Efficiency Resource Standards

Policy Type	Description	Applicable States
Statewide Energy Efficiency Resource Standard	Typically set by state legislatures and/or utility commissions, a statewide EERS requires utilities to achieve a prescribed level of savings. In some states, legislatures require utilities to invest in all cost-effective efficiency, with specific targets set by stakeholder councils and public utilities commissions.	Arizona, Arkansas, California, Connecticut, Illinois, Indiana, Maine, Maryland, Massachusetts, Michigan, Minnesota, New Mexico, New York, Ohio, Pennsylvania, Rhode Island, Texas
Tailored Target	Initiated in a variety of ways, long-term energy efficiency targets in these states are tailored to each specific utility or third-party program administrator. In each case, law or regulation calls for the establishment of multi-year (three years or more), specific energy savings targets, often incorporated as part of the integrated resource planning (IRP) process.	Colorado, Iowa, Oregon, Vermont, Washington, Wisconsin
Combined Energy Efficiency Resource Standard and Renewable Portfolio Standard	Energy efficiency is classified as an eligible resource in state renewable portfolio standards. In these cases, energy efficiency is measured on a cumulative, rather than annual, incremental basis.	Hawaii, Nevada, North Carolina

Financial Incentives Affecting Utility Investment in Efficiency: Earning a Return and Addressing Lost Revenues

Under traditional regulatory structures, utilities do not have an economic incentive to help their customers become more energy efficient. In fact, they typically have a disincentive, because falling energy sales from energy efficiency programs reduce utilities' revenues and profits, an effect referred to as "lost revenues" or "lost sales." Since utilities' earnings are usually based on the total amount of capital invested in certain asset categories (such as transmission and distribution infrastructure and power plants) and the amount of electricity sold, the financial incentives are very much tilted in favor of increased electricity sales and expanding supply-side systems.

This dynamic has led industry experts to devise ways of addressing possible loss of earnings and profit that can result from customer energy efficiency programs in order to remove utilities' financial disincentive to promote energy efficiency. There are three key policy approaches to properly aligning utility incentives and removing barriers to energy efficiency. The first is to ensure that utilities can recover the direct costs associated with energy efficiency programs. This is a minimum threshold requirement for utilities and related organizations to fund and offer energy efficiency programs, and virtually every state allows this in some form. Given the wide acceptance of program cost recovery, we do not address it in the *State Scorecard*.

The other two mechanisms are fixed cost recovery (decoupling and other lost revenue adjustment mechanisms) and performance incentives. Decoupling—the disassociation of a utility's revenues from its sales—makes the utility indifferent to decreases or increases in

sales, removing what is known as the "throughput incentive." Although decoupling does not necessarily make the utility more likely to promote efficiency programs, it removes the disincentive for it to do so. Additional mechanisms for addressing lost revenues include modifications to customers' rates that permit utilities to collect the revenues "lost" either through a lost revenue adjustment mechanism (LRAM) or other ratemaking approach. ACEEE views decoupling as the preferred approach to address the "throughput incentive," and the lost revenue adjustment mechanism as a second-best approach. Performance incentives are financial incentives that reward utilities (and in some cases, non-utility organizations) for reaching or exceeding specified program goals. These include a shareholder incentive that is awarded based on achievement of energy savings targets and an incentive based on spending goals. Of the two, ACEEE recommends the former, shareholder incentives based on achieved savings. A number of states have enacted mechanisms such as these that align utility incentives with energy efficiency, as seen in Table 20.

METHODOLOGY & RESULTS

A state could earn up to 20 points in this category, or 40% of the total possible 50 points in the *State Scorecard*. Among efficiency programs, studies suggest that electricity programs typically achieve at least three times more primary energy savings than natural gas programs (Eldridge et al. 2009; SWEEP 2007). Therefore, we allocated ten (10) points in this policy area to performance metrics for electricity programs (annual budgets and savings data) and three points to performance metrics for natural gas programs (annual budgets).[13] Table 8 lists states' overall scoring in this category.

For this chapter of the *State Scorecard,* we gathered statewide data on:

- Utility sales to end-users in 2011
- Utility revenues from sales to end-users in 2011
- Number of residential natural gas customers in 2011
- Budgets for electricity and natural gas energy efficiency programs in 2012
- Actual spending on electricity and natural gas energy efficiency programs in 2011
- Incremental savings from electricity and natural gas energy efficiency programs in 2011

[13] Energy savings data for natural gas programs are not tracked through a national clearinghouse and are not readily reported by states; therefore, these data do not appear in our scoring. This year we did attempt to collect such data, but the response did not warrant inclusion in our scoring. Similarly, programs that help customers conserve home heating fuel or propane do not systematically report energy savings.

Table 8. Summary of State Scoring on Utility and Public Benefits Programs and Policies

State	2012 Electricity Program Budgets (5 pts.)	2012 Gas Program Budgets (3 pts.)	2011 Electricity Program Savings (5 pts.)	2011 Natural Gas Program Savings (1 pt.)	Energy Efficiency Resource Standard (3 pts.)	Performance Incentives & Fixed Cost Recovery (3 pts.)	Total Score (20 pts.)
Massachusetts	5	3	4.5	0.5	3	3	19
Rhode Island	5	3	4	0.5	3	3	18.5
Vermont	5	3	5	1	3	1.5	18.5
New York	3.5	2	4	0.5	3	3	16
California	4	1.5	4.5	0.5	1.5	3	15
Minnesota	3	1.5	4	1	3	2.5	15
Oregon	4.5	2.5	3	0.5	2.5	1.5	14.5
Connecticut	3	2	4	0.5	2.5	2	14
Washington	5	1	3	0.5	2	1.5	13
Arizona	2	0.5	4.5	0	3	2	12
Iowa	3	3	3	0.5	2.5	0	12
Michigan	1.5	1.5	3	0.5	2	2.5	11
Ohio	1.5	1	4	0	2	2.5	11
Colorado	2	0.5	2	0.5	3	2.5	10.5
Maine	2	1.5	3.5	0.5	3	0	10.5
Hawaii	1	0.5	4	0.5	2	2	10
Illinois	2	1.5	2	0	3	1	9.5
Indiana	0.5	0.5	1.5	0.5	3	2.5	8.5
Maryland	2	0.5	1.5	0	3	1.5	8.5
New Hampshire	1.5	3	2	0.5	0	1.5	8.5
New Jersey	3.5	2	2	0.5	0	0.5	8.5
Utah	1.5	2	2.5	0.5	0	1	7.5
Wisconsin	1	0.5	1.5	0.5	1	3	7.5
New Mexico	1	0	1.5	0	2	2.5	7
Arkansas	1.5	1	0	0	2	1.5	6
Montana	2	1	1.5	0.5	0	1	6
Pennsylvania	2	0.5	3	0	0.5	0	6
Idaho	2.5	0.5	2.5	0	0	0	5.5
Nevada	1.5	0.5	2	0	0	1	5
North Carolina	0.5	0	1	0	0.5	2.5	4.5
Missouri	0	0.5	1	0	0	2.5	4
Oklahoma	0.5	0.5	0.5	0	0	2.5	4
South Dakota	0.5	0.5	0.5	0	0	2.5	4
District of Columbia	1	0	0	0	0	2.5	3.5
Kentucky	0.5	0	0.5	0	0	2.5	3.5
South Carolina	0.5	0	1	0	0	1.5	3
Alabama	0	0	0	0	0	2.5	2.5
Delaware	0	0.5	0.5	0	0	1.5	2.5
Florida	1	1	0.5	0	0	0	2.5
Louisiana	0	0	0	0	0	2.5	2.5

State	2012 Electricity Program Budgets (5 pts.)	2012 Gas Program Budgets (3 pts.)	2011 Electricity Program Savings (5 pts.)	2011 Natural Gas Program Savings (1 pt.)	Energy Efficiency Resource Standard (3 pts.)	Performance Incentives & Fixed Cost Recovery (3 pts.)	Total Score (20 pts.)
Tennessee	0.5	0	1	0	0	0.5	2
Texas	0.5	0	0.5	0	0	1	2
Wyoming	0.5	0.5	0	0	0	1	2
Georgia	0	0	0	0	0	1.5	1.5
Mississippi	0	0	0	0	0	1	1
Nebraska	0.5	0	0.5	0	0	0	1
Virginia	0	0	0	0	0	1	1
West Virginia	0.5	0	0	0	0	0.5	1
Kansas	0	0	0	0	0	0.5	0.5
North Dakota	0	0	0	0	0	0.5	0.5
Alaska	0	0	0	0	0	0	0

Our data sources include the Consortium for Energy Efficiency (CEE 2013), the U.S. Energy Information Administration (EIA 2012a, 2013a, 2013b, 2013c), regional efficiency groups, and information requests sent to state utility commissions. Energy efficiency program data were subject to revision and updating depending on the timing of reporting and completeness of the reporting entities. For these reasons, we sent the utility program data we gathered to state utility commissions and independent statewide administrators for review. We also asked commissions and program administrators for data on natural gas program savings, and whether program savings were reported as gross or net.[14] Overall scores for utility programs and policies are given in Table 8. Tables 11, 12, 14, and 16 provide data on electricity and natural gas efficiency budgets and savings in the most recent years for which data are available.

Our methodology for this policy area, while comprehensive, does lead to some unintended impacts on state rankings. For example, our methodology disadvantages several states because of the types of energy used or fuels offered to consumers. Hawaii, for example, has the lowest natural gas consumption among all the states, the bulk of which is accounted for by the commercial sector (EIA 2012b); therefore, energy efficiency efforts in that state are aimed at reducing electricity consumption only. In past years, Hawaii has not earned points in the *State Scorecard* for natural gas efficiency budgets. This year, we attempted to rectify our likely underevaluation of relative efficiency efforts in Hawaii by awarding them points for natural gas efficiency budgets equivalent to the proportion of points earned for electricity efficiency program budgets. Elsewhere, particularly in the Northeast, energy efficiency efforts often aim to reduce the consumption of fuel oil. In some cases, we captured these efforts in budgets for electricity programs, but we have not specifically accounted for fuel oil savings from non-electricity programs.

[14] "Gross" savings refer to savings that are expected from energy efficiency programs, according to planning assumptions. In contrast, "net" savings are those actually attributable to the program, and are typically calculated by removing "freeriders," or program participants who would have implemented or installed the energy efficiency measures even without any incentive, or with a reduced incentive. However, states differ in how they define, measure and account for freeridership and other components of the net savings calculation (Haeri and Khawaja 2012).

This year, as previously noted, we awarded points for natural gas savings. These data are not publicly available from a single source, and thus we relied on our contacts at state utility commissions to supply the data used for scoring. States whose utility commissions did not respond to our request for data thus did not receive points in this category, whether or not they realized savings from natural gas efficiency programs in 2011.

Finally, our choice to report programs' incremental annual savings (new savings from programs in each program cycle) and not cumulative energy savings (all savings accrued over the life of a particular program) could be seen as disadvantaging states with long-standing energy efficiency efforts. We choose to report incremental savings in the *State Scorecard* for two reasons. First, basing our scoring on cumulative energy savings would invite several new levels of complexity which are beyond the scope of the *State Scorecard*, including identifying the start year for the cumulative series, accurately accounting for the life of energy efficiency measures, and measuring the persistence of savings. Second, the *State Scorecard* aims to provide a snapshot of states' ongoing energy efficiency programs, and incremental savings give a clearer picture of recent efforts.

Scoring on Electricity Program Budgets

In this category, we scored states on reported annual electricity energy efficiency program budgets for 2012. The data presented in this section are for customer-funded energy efficiency programs, that is, energy efficiency programs funded through charges included in utility customers' rates or as a line item on customer bills. This includes budgets for utility-administered programs—which may include investor-owned utilities, municipal utilities, cooperative utilities, other public power companies or authorities—and for customer-funded public benefits programs administered by independent statewide program administrators. We did not collect data on the federal Weatherization Assistance Program, which gives money to states on a formula basis. We did include revenues from the Regional Greenhouse Gas Initiative that contribute to customer-funded energy efficiency program portfolios of member states. (Where Regional Greenhouse Gas Initiative funds were channeled to energy efficiency initiatives implemented by state governments, we included them in Chapter 6, State Government-Led Initiatives.)

In the 2010 edition of the *State Energy Efficiency Scorecard*, we began reporting energy efficiency program *budgets* rather than actual spending figures. This was done to make our reporting more timely and to better represent the rapid increases in energy efficiency funding being made in states.[15] This year, as in previous years, we gathered energy efficiency program budget data from several sources: the Consortium for Energy Efficiency's *2012 Annual Industry Report*, *Efficiency Program Industry by State and Region Appendices* (CEE 2013), data requests to state utility commissions, regional efficiency groups, and other state sources.[16] This year, we also attempted to collect data on actual program spending in 2012. However, these data are not publically available through any single

[15] Prior to 2010, we depended on actual spending data from the U.S. EIA, which has a two-year time lag.
[16] CEE surveys administrators of public benefits programs annually to capture trends in aggregated budgets and expenditures. CEE has granted ACEEE permission to reference survey results as of a point in time for the purpose of capturing updates to the non-load management portion of the results. The full report is viewable at http://library.cee1.org/content/2012-state-efficiency-program-industry-report/.

source, and only a handful of states were able to provide complete spending numbers. Therefore, we continued to rely on budgets for this year's scoring.

Our reliance on budgets means data may fluctuate, and we capture data only as they are calculated at a particular point in time. As mentioned earlier, program data are subject to a certain degree of revision and updating by states depending on the timing of reporting and differences in reporting requirements of utilities and other program administrators. It is also important to note that budget data are subject to some level of subjectivity. Several states report shareholder incentives as part of their utility efficiency program budgets, which could lead to slightly inflated numbers. As in past years, we sent budget data gathered from the sources above to state utility commissions for review. Tables 11 and 12 report electricity and natural gas efficiency program budgets, respectively.

It is important to clarify that budget data capture intention rather than the execution of actual energy efficiency spending, and that the difference between spending and budgets varies from state to state. From year to year, however, the ratio of spending to budgets has remained fairly constant. For 2009, the first year for which we tracked both spending and budgets, we found that actual spending nationwide on electricity efficiency programs was 89% of the reported budget figures, with a total spending gap of $301 million. In 2010, the spending gap rose to $505 million but actual spending remained at 89% of reported electricity program budgets nationwide. In 2011, the spending gap grew to more noticeable levels—about $1 billion. Actual spending was only about 83% of reported budgets. Although this diverges slightly from the relationship between budgets and spending we had seen in the past, we believe that budgets remain the fairest and most timely way to benchmark states. We will continue to monitor the difference between spending and budgets in future years.

Table 9. Scoring of Electric Efficiency Program Budgets

Budgets as % of Revenues	Score
4.00% or greater	5
3.60%–3.99%	4.5
3.20%–3.59%	4
2.80%–3.19%	3.5
2.40%–2.79%	3
2.00%–2.39%	2.5
1.60%–1.99%	2
1.20%–1.59%	1.5
0.80%–1.19%	1
0.40%–0.79%	0.5
Less than 0.40%	0

States could receive up to five (5) points based on the percentage of electric utility revenues represented by energy efficiency budgets.[17] To reflect the rise in median expenditure in proportion to revenue,[18] and the general upward trend of efficiency program spending, our scoring was adjusted upward from last year's *State Scorecard*. Budgets representing at least 4% of revenues earned the maximum of five (5) points. For every 0.4% less than 4%, a state's score decreased by one-half (0.5) point. This is a significant change from last year, when

[17] Statewide revenues are from EIA (2013a). We measure budgets as a percentage of revenues to normalize the level of energy efficiency spending. Blending utility revenues from all customer classes gives a more accurate measure of utilities' overall spending on energy efficiency than expressing budgets per capita, which might skew the data for utilities that have a few very large customers. An alternative metric, statewide electric energy efficiency budgets per-capita, is presented in Appendix A.
[18] In 2011, the median electric efficiency program budget as a percent of utility revenues was 0.96%. In 2012, the median rose to 1.08%.

states received the maximum points for electricity efficiency budgets that were set at 2.5% of revenues or greater. Table 9 lists the scoring bins for each level of spending and Table 11 shows state-by-state results and scores for this category.

Scoring on Natural Gas Program Budgets

We scored states on natural gas efficiency program budgets by awarding up to three (3) points based on 2012 program budget data gathered from utility commission filings, the Consortium for Energy Efficiency (CEE 2013), and a survey of state utility commissions and independent statewide administrators. In order to directly compare spending data among the states, we normalize spending by the number of residential natural gas customers in each state, as reported by the EIA (2013b).[19] Table 10 shows scoring bins for natural gas program spending.

Table 10. Scoring of Natural Gas Utility and Public Benefits Budgets

Budget Range ($ per customer)	Score
$50 or greater	3
$41.00–49.99	2.5
$32.00–40.99	2
$23.00–31.99	1.5
$14.00–22.99	1
$5.00–13.99	0.5
Less than $5.00	0

This year, we continued to see dramatic variation in spending on natural gas efficiency programs. Overall budgets for natural gas programs rose by more than $200 million compared to last year, with many states spending more than $50 per residential customer. We have adjusted our scoring to reflect the increase in spending by high-ranking states.[20] However, overall natural gas efficiency budgets remained significantly lower than budgets for electricity programs. Table 12 shows states' scores.

[19] We use spending per residential customers for natural gas because reliable natural gas revenue data are sparse, and per capita unfairly penalizes states with natural gas service to only a portion of the state's population (such as Vermont). State data on the number of residential customers is from EIA (2013b).

[20] In 2012, states received full points for natural gas program spending of $36 per customer.

Table 11. 2012 Electric Efficiency Program Budgets by State

State	2012 Budget ($million)	% of Statewide Utility Revenues	Score (5 pts.)
Rhode Island	61.4	7.61%	5
Massachusetts[1]	515.7	6.78%	5
Washington[2]	344.8	5.37%	5
Vermont[3]	39.3	5.20%	5
Oregon[4]	153.0	3.98%	4.5
California	1166.6	3.28%	4
New Jersey[5]	329.4	3.16%	3.5
New York[6]	668.9	3.09%	3.5
Connecticut[7]	128.1	2.79%	3
Minnesota[8]	156.0	2.60%	3
Iowa[9]	90.6	2.56%	3
Idaho	38.7	2.39%	2.5
Maryland[10]	139.2	1.99%	2
Montana[11]	21.0	1.84%	2
Pennsylvania	257.0	1.80%	2
Illinois	208.6	1.72%	2
Maine[12]	23.4	1.71%	2
Arizona	124.0	1.69%	2
Colorado[13]	81.4	1.62%	2
Utah	36.1	1.55%	1.5
New Hampshire[14]	22.9	1.48%	1.5
Michigan[15]	169.2	1.47%	1.5
Ohio	200.7	1.45%	1.5
Arkansas[16]	50.3	1.42%	1.5
Nevada[17]	42.0	1.34%	1.5
Hawaii[18]	35.6	1.09%	1
Wisconsin[19]	78.7	1.08%	1
New Mexico[20]	19.7	0.96%	1
District of Columbia[21]	12.2	0.92%	1
Florida	200.0	0.87%	1
Oklahoma	34.1	0.77%	0.5
Indiana	62.7	0.73%	0.5
Nebraska[22]	17.5	0.70%	0.5
Tennessee	58.2	0.65%	0.5
South Carolina[23]	40.5	0.58%	0.5
Kentucky	36.4	0.57%	0.5
North Carolina	61.7	0.53%	0.5
Wyoming[24]	6.0	0.49%	0.5
South Dakota[25]	4.8	0.48%	0.5
Texas	144.4	0.46%	0.5
West Virginia	9.9	0.40%	0.5
Missouri	26.3	0.38%	0
Kansas[26]	12.3	0.33%	0
Delaware[27]	3.8	0.30%	0
Mississippi	11.9	0.29%	0
Georgia	29.9	0.25%	0
Alabama	10.1	0.13%	0
Louisiana	3.7	0.06%	0
Virginia	0.2	0.00%	0
Alaska	0.0	0.00%	0
North Dakota	0.0	0.00%	0
US Total	5988.9	1.63%	
Median	40.5	1.09%	

Sources & notes: Budget data are from CEE (2013) except where noted. Statewide revenue data are from EIA (2013a). [1]MA DOER (2013); [2]Includes share of budget based on 2011 allocation of BPA incentive dollars across states (2013); [3]VEIC (2013); [4]Energy Trust of Oregon (2013), includes share of budget from BPA incentive dollars (2013); [5]AEG (2013); [6]Includes NYSERDA (2013), NY DPS (2013), and LIPA (2013); [7]CT DEEP (2013); [8]MN DOC (2013); [9]Includes share of budget from BPA incentive dollars(2013); [10]MD PSC (2013); [11]Includes share of budget from BPA incentive dollars (2013); [12]Efficiency Maine (2013); [13]CO PUC (2013); [14]NH PUC (2013); [15]MI PSC (2013); [16]AR PSC (2013); [17]NV PUCN (2013), BPA (2013); [18]Jim Flanagan Associates (2013); [19]Actual spending from WI PSC (2013); [20]NM PRC (2013); [21]Actual spending from DDOE (2013); [22]NE NEO (2013); [23]Actual spending from SC ORS (2013); [24]Includes share of budget from BPA incentive dollars; [25]SD PUC (2013); [26]KCC (2013); [27]DNREC (2013)

Table 12. 2011 Natural Gas Efficiency Program Budgets by State

State	2012 Budget ($million)	$ Per Residential Customer	Score (3 pts.)
Massachusetts[1]	137.0	97.28	3
New Hampshire[2]	7.9	81.11	3
Rhode Island[3]	13.7	60.67	3
Iowa[4]	46.7	52.84	3
Vermont	2.0	51.49	3
Oregon	31.4	45.59	2.5
New York[5]	154.7	35.53	2
Connecticut[6]	19.1	38.59	2
Utah	28.3	34.09	2
New Jersey	86.9	32.68	2
Illinois	120.2	31.17	1.5
Minnesota[7]	42.9	29.87	1.5
Michigan[8]	83.9	26.60	1.5
California	263.7	24.82	1.5
Maine[9]	0.5	23.15	1.5
Florida	14.9	21.96	1
Washington[10]	23.0	21.31	1
Arkansas[11]	11.3	20.48	1
Ohio	48.1	14.86	1
Montana[12]	3.7	14.28	1
Oklahoma	11.7	12.69	0.5
Wisconsin	20.2	12.08	0.5
Maryland[13]	12.4	11.51	0.5
Indiana[14]	17.6	10.31	0.5
Colorado[15]	16.9	10.27	0.5
Delaware[16]	1.3	8.55	0.5
Nevada	6.5	8.41	0.5
Pennsylvania	21.6	8.10	0.5
Missouri[17]	9.2	6.85	0.5
Arizona	6.8	5.93	0.5
South Dakota	1.0	5.85	0.5
Wyoming	0.9	5.80	0.5
Idaho	1.9	5.42	0.5
Hawaii	0.0	0.00	0.5*
New Mexico[18]	2.8	4.91	0
District of Columbia[19]	0.7	4.81	0
Virginia	5.2	4.54	0
Kentucky	3.2	4.22	0
Kansas[20]	1.2	1.40	0
North Carolina	1.3	1.15	0
North Dakota	0.1	0.80	0
South Carolina	0.4	0.69	0
Texas	2.9	0.67	0
Alabama	0.0	0.00	0
Alaska	0.0	0.00	0
Georgia	0.0	0.00	0
Louisiana	0.0	0.00	0
Mississippi	0.0	0.00	0
Nebraska	0.0	0.00	0
Tennessee	0.0	0.00	0
West Virginia	0.0	0.00	0
US Total	**1294.5**	**18.32**	
Median	**6.5**	**8.55**	

Sources & notes: *Hawaii uses a very limited amount of natural gas. Points are commensurate with points earned for electric efficiency budget.

Budget data is from CEE (2013) unless otherwise noted. [1]MA DOER (2013); [2]NH PUC (2013); [3]RI PUC (2013); [4]IUB (2013); [5]Includes data from NYSERDA (2013) and NY DPS (2013); [6]CT DEEP (2013); [7]MN DOC (2013); [8]MI PSC (2013); [9]Efficiency Maine (2013); [10]WA UTC (2013); [11]AR PSC (2013); [12]Actual spending from MT PSC (2013); [13]MD PSC (2013); [14]IN URC (2013); [15]CO PUC (2013); [16]DNREC (2013); [17]MO PSC (2013); [18]NM PRC (2013); [19]Actual spending; [20]KCC (2013)

Scoring on Annual Savings in 2011 from Electric Efficiency Programs

We scored states on net annual incremental electricity savings[21] that resulted from energy efficiency programs offered in 2011.[22] Data for electricity sales and savings were based on EIA's *Monthly Electric Utility Sales and Revenue Data* (2013a) and *Annual Electric Power Industry Report* (2012a), which we supplemented with data from a survey of state utility commissions and independent statewide utility program administrators.

States use different methodologies for determining energy savings from efficiency programs, differences that can produce inequities when making comparisons.[23] A state's EM&V process plays a key role in determining how savings are quantified. This is particularly true of a state's treatment of "free riders" (savings attributed to a program that would have occurred anyway in the absence of the program) and "free-drivers" (savings *not* attributed to a program that would *not* have occurred without it). Energy savings are reported as either "net" or "gross," with net savings accounting for free-riders and free-drivers, and gross savings not accounting for these. Our research specifically focuses on net savings figures.

A national survey of evaluation practices for state energy efficiency programs found that of the 45 jurisdictions with formally approved customer-funded energy efficiency programs, 21 jurisdictions reported net savings, 12 reported gross savings, and nine reported both (for different purposes). (Kushler et al. 2012)[24] These findings point to several important caveats to the electric program savings data. First, a number of states do not estimate or report net savings. In these cases, we have applied a standard factor of 0.9 to convert gross savings to net savings (a "net-to-gross ratio").[25] Doing so allows for more straightforward comparison with other states that report net electricity savings. Savings (or some portion of which) reported as gross[26] are marked by an asterisk (*) in Table 14. In Arizona, a monitoring and evaluation study confirmed that net savings are equal to gross savings within the state (SWEEP 2013b). In such cases, we have not applied a conversion factor, and consider reported savings to be net.

A second caveat is that gross savings are calculated differently by some states: Many states that report only gross savings apply "deemed savings" methodologies that do take into account free- ridership; therefore, these states' gross savings figures are likely closer to net figures than those of states that do not calculate gross savings in this way.

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[21] Net incremental electricity savings are new savings achieved from measures implemented in the reporting year.

[22] While 2012 savings data are available in some states, it is not feasible to compare 2012 data for all 50 states due to significant differences in the timing of reporting across and within the states. Readers should also note that programs that have been running for several years at a high level of funding are achieving the highest levels of *cumulative* electricity savings (total energy savings achieved to date from efficiency measures). *Incremental* savings data, which measure new savings achieved in the current program year, are the best way to directly compare state efforts due to the difficulty in tracking the duration of programs and their savings.

[23] See Sciortino, Nowak et al. (2011).

[24] This includes 44 states and the District of Columbia. Three states did not offer a response to this question.

[25] A net-to-gross ratio of 0.9 falls within the range of factors used by several states in calculating net efficiency program savings, including Massachusetts (MAGEEPA 2010), Maryland (Itron 2011), New York (NY DPS 2010), Vermont (Efficiency Vermont 2012), and Michigan (ACEEE survey).

[26] Savings were determined to be gross based on Kushler et al. (2012) and on responses to our survey of public utility commissions.

We have reported 2011 statewide energy efficiency savings from EIA (2012a) as a percentage of retail electricity sales in 2011 and scored the states on a scale of 0 to 5. This year, in an attempt to achieve a point allocation that will remain relevant in the long-term, we adjusted our scoring to reflect the increased savings achieved in many states. Since 2011, median savings has risen from 0.38% to 0.58% as a percentage of total retail sales. This year, states that achieved savings equivalent to at least 1.5% of electricity sales earned five (5) points, with scores decreasing by on-half (0.5) point for every 0.15%-decrease.[27]

Table 13 lists the scoring bins for each level of savings and Table 14 shows state-by-state results and scores. Across the nation, reported savings from utility and public benefits electricity program in 2011 totaled 22 million megawatt-hours (MWh), equivalent to 0.60% of sales. By way of comparison, savings from 2010 totaled just over 18 million MWh (0.49% of sales). Savings in 2011 therefore represented an increase of 20% over the previous year, and an increase in savings as a percentage of sales of more than one-tenth of a percentage point. We have adjusted our scoring bins to reflect this trend and to leave room for expected future increases in savings as states continue to ramp up their utility programs.

Table 13. Scoring Methodology for Utility and Public Benefits Electricity Savings

Savings as % of Sales	Score
1.5% or greater	5
1.35%–1.49%	4.5
1.2%–1.34%	4
1.05%–1.19%	3.5
0.90%–1.04%	3
0.75%–0.89%	2.5
0.60%–0.74%	2
0.45%–0.59%	1.5
0.30%–0.44%	1
0.15%–0.29%	0.5
Less than 0.15%	0

[27] Last year, states earned full credit for reported net annual incremental sales of 1.2% of sales.

Table 14. 2011 Net Incremental Electricity Savings by State

State	2011 Net Incremental Savings (MWh)	% of Retail Sales	Score (5 pts.)
Vermont[1]	117,940	2.12%	5
Massachusetts[2]	789,894	1.43%	4.5
Arizona[3]	1,028,378	1.38%	4.5
California	3,399,300	1.35%	4.5
Connecticut[4]	394,266	1.32%	4
Hawaii[5]	130,108	1.31%	4
New York[6]	1,791,302	1.25%	4
Rhode Island	96,009	1.25%	4
Ohio	1,880,629	1.22%	4
Minnesota[7]	818,512*	1.21%	4
Maine[8]	120,211	1.05%	3.5
Iowa[9]	475,964	1.04%	3
Pennsylvania	1,553,739	1.04%	3
Michigan[10]	1,000,437	1.00%	3
Oregon[11]	465,211	0.99%	3
Washington	853,253	0.92%	3
Utah	245,308	0.85%	2.5
Idaho	189,082	0.82%	2.5
Nevada[12]	250,559*	0.74%	2
New Jersey[13]	530,453	0.69%	2
Illinois	951,055	0.67%	2
Colorado	347,132	0.65%	2
New Hampshire[14]	69,409*	0.64%	2
Maryland	397,748	0.58%	1.5
Montana[15]	80,592	0.58%	1.5
Indiana	605,904	0.58%	1.5
Wisconsin[16]	408,221	0.57%	1.5
New Mexico[17]	106,891	0.47%	1.5
Missouri	369,438	0.44%	1
North Carolina[18]	514,195	0.39%	1
Tennessee	333,563	0.33%	1
South Carolina	255,110	0.32%	1
Nebraska[19]	80,000	0.27%	0.5
Florida	583,171	0.26%	0.5
Kentucky	224,585	0.25%	0.5
Oklahoma	117,826	0.20%	0.5
Texas	721,445	0.20%	0.5
South Dakota[20]	20,532	0.18%	0.5
Delaware[21]	20,478	0.18%	0.5
Mississippi	66,913	0.14%	0
Arkansas	63,677	0.13%	0
Georgia	152,771	0.11%	0
Virginia	109,224	0.10%	0
Wyoming	14,001	0.08%	0
Kansas[22]	30,918	0.08%	0
Alabama	69,537	0.08%	0
North Dakota	9,491	0.07%	0
West Virginia	7,888	0.03%	0
Alaska	1,276	0.02%	0
Louisiana[23]	15,813	0.02%	0
District of Columbia[24]	0	0.00%	0
US Total	**22,879,359**	**0.62%**	
Median	**245,308**	**0.58%**	

*** At least a portion of savings reported as gross. The gross portion has been adjusted by a net-to-gross factor of 0.9 to make it more comparable to net savings figures reported by other states.**

Sources and Notes: All savings data are as reported in EIA (2013a), unless noted.[1]VEIC (2013); [2]MA DOER (2013); [3]SWEEP (2013); [4]CT DEEP (2013); [5]Jim Flanagan Associates (2013); [6]Includes NYSERDA (2013), NY DPS (2013), NYPA (2013), and LIPA (2013); [7]MN PUC (2013); [8]Efficiency Maine (2013); [9]Includes savings from IUB (2013); [10]MI PSC (2013); [11]Energy Trust of Oregon (2013), includes savings from BPA (2013); [12]Includes gross savings from NV PUC (2013) that have been adjusted; [13]AEG (2013); [14]NH PUC (2013); [15]MT PSC (2013); [16]Includes savings from WI PSC (2013); [17]NM PRC (2013); [18]NC PUC (2013);[19]NEO (2013); [20]SD PUC (2013); [21]DNREC (2013); [22]KCC (2013); [23]Entergy New Orleans Program Year 1 Savings from Entergy (2012); [24]No savings were reported due to transition year between energy efficiency program administrators

Scoring on Annual Savings in 2011 from Natural Gas Efficiency Programs

This year, we analyzed savings from natural gas efficiency programs for the first time. Increasingly, utilities are beginning to incorporate natural gas programs in their portfolio of energy efficiency activities. However, data on savings resulting from these programs are still limited. In this category, we awarded points to states that were able to track savings from their natural gas efficiency programs and that realized savings of at least 0.25% as a percentage of sales in the residential and commercial sectors. We relied on data from state utility commissions and the Northeast Energy Efficiency Partnership's Regional Energy Efficiency Database (NEEP-REED 2013). Table 15 lists scoring criteria for natural gas program savings.

Table 15. Scoring Methodology for Natural Gas Program Savings

Natural Gas Savings as % of Sales	Score
1% or greater	1
0.25%–0.99%	0.5
Less than 0.25%	0

Note: States that did not provide natural gas savings data were treated as having no 2011 savings

Table 16 shows states' scores for natural gas program savings.

Scoring on Energy Efficiency Resource Standards

In this category, we credited states that had mandatory savings targets codified in EES policies. We relied on legislation and utility commission dockets for our research in this section.

A state could earn up to three (3) points for an EERS policy based on a number of factors. As shown in Table 17, the major considerations included savings targets, whether the EERS covered both electricity and natural gas, and whether the policy was binding. Some EERS policies also contain "cost caps" that limit spending, or allow large industrial customers to "opt out" of efficiency programs both of which reduce the effectiveness of the EERS policy. We reduced a state's score by one-half (0.5) point for each of these criteria.

Table 16. State Scores for 2011 Natural Gas Efficiency Program Savings

State	2011 Net Incremental Savings (MMTherms)*	% of Retail Sales**	Score (1 pt.)
Vermont[1]	1.11	1.91%	1
Minnesota[2]	27.99	1.25%	1
Michigan[3]	39.2	0.80%	0.5
Massachusetts[4]	15.18	0.71%	0.5
Iowa[5]	8.40	0.69%	0.5
Oregon[6]	4.84	0.61%	0.5
Wisconsin[7]	12.30	0.56%	0.5
New Hampshire[8]	0.90	0.55%	0.5
Washington[9]	7.20	0.50%	0.5
California[10]	33.84	0.44%	0.5
Rhode Island[11]	1.19	0.42%	0.5
Utah[12]	4.60	0.41%	0.5
New York[13]	27.24	0.39%	0.5
Montana[14]	1.60	0.36%	0.5
Connecticut[15]	3.22	0.35%	0.5
Maine[16]	0.26	0.32%	0.5
Colorado[17]	5.20	0.27%	0.5
Indiana[18]	5.69	0.27%	0.5
New Jersey[19]	10.30	0.25%	0.5
Hawaii[20]	0	0.00%	0.5
Arizona[21]	1.68	0.23%	0
Arkansas[22]	1.70	0.23%	0
Illinois[23]	15.1	0.23%	0
South Dakota[24]	0.40	0.16%	0
Nevada[25]	0.846	0.12%	0
Maryland[26]	0.98	0.07%	0
New Mexico[27]	0.40	0.07%	0
Idaho[28]	0.28	0.06%	0
Kansas[29]	0.46	0.05%	0
Delaware[30]	0.08	0.04%	0
Oklahoma[31]	0.12	0.01%	0
Alabama	0	0.00%	0
Alaska	0	0.00%	0
District of Columbia	0	0.00%	0
Florida	0	0.00%	0
Georgia	0	0.00%	0
Kentucky	0	0.00%	0
Louisiana	0	0.00%	0
Mississippi	0	0.00%	0
Missouri	0	0.00%	0
Nebraska	0	0.00%	0
North Carolina	0	0.00%	0
North Dakota	0	0.00%	0
Ohio	0	0.00%	0
Pennsylvania	0	0.00%	0
South Carolina	0	0.00%	0
Tennessee	0	0.00%	0
Texas	0	0.00%	0
Virginia	0	0.00%	0
West Virginia	0	0.00%	0
Wyoming	0	0.00%	0

Notes: *States that did not provide natural gas savings data were treated as having no 2011 savings.
**Sales include only those attributed to commercial and residential sectors. All sales data from EIA (2013b).

Sources: [1]NEEP-REED (2013); [2]MEEA (2013); [3]MI PSC (2013); [4]NEEP-REED (2013); [5]IUB (2013); [6]Energy Trust of Oregon (2013); [7]WI PSC (2013); [8]NH PUC (2013); [9]WA UTC (2013); [10]CPUC (2013) [11]RI PUC (2013); [12]UT PSC (2013); [13]NEEP-REED (2013); [14]MT PSC (2013); [15]NEEP-REED (2013); [16]Efficiency Maine (2013); [17]CO PUC (2013); [18]IURC (2013); [19]AEG (2013); [20]Hawaii is awarded points commensurate with electricity savings; [21]SWEEP (2013); [22]AR PSC (2013); [23]IL DCEO (2013); [24]SD PUC (2013); [25]NV PUCN (2013); [26]NEEP-REED (2013); [27]NM PRC (2013); [28]Avista (2012); [29]KCC (2013); [30]DNREC (2013); [31]Includes only savings for ONG and CenterPoint, OCC (2013)

Table 17. Scoring Methodology for Energy Savings Targets

Percent Savings Target or Current Level of Savings Met	Score
1.5% or greater	3
1% to 1.49%	2
0.5% to 0.99%	1
Less than 0.5%	0

Other Considerations	Score
Cost cap is in place	-0.5
Industrial opt out	-0.5
EERS includes natural gas	+0.5

To aid in comparing states, we estimate an average annual savings target over the period specified in the policy. For example, Arizona plans to achieve 22% cumulative savings by 2020, so the annual average target is 2.4%.

States with pending targets had to be on a clear path toward establishing a binding mechanism in order to earn points in this category. Examples of a clear path included draft decisions by commissions awaiting approval within six months, or agreements among major stakeholders on targets. It is under this stipulation that we add Connecticut to our list this year. States with a pending EERS policy that had not yet established a clear path toward implementation include Alaska, Tennessee,[28] Oklahoma, New Hampshire, Utah,[29] Delaware, and Virginia. See Table 18 below for scoring results, and Appendix B for full policy details.

Since the publication of the 2012 edition of the *State Energy Efficiency Scorecard*, there have been changes in the status of EERS policies in four states. In New Mexico, 2020 targets were lowered from 10% to 8% as part of a piece of compromise legislation. Efficiency advocates accepted the reduced target in order to permanently set spending requirements for energy efficiency and load management programs for investor-owned utilities at 3% of revenue and update the methodology of cost effectiveness tests used by utilities to evaluate potential programs. In Nevada, legislators voted this year to phase energy efficiency allowances out of the state's RPS by 2020. This resulted in a significant decrease in predicted energy savings. Though Maine failed to earn points in this category in 2012, recent legislation has significantly increased funding to Efficiency Maine, allowing the state's savings targets to be considered for points in the *State Scorecard* this year. Maine's legislators voted to override the governor's veto of LD 1559 in June, immediately increasing funding levels for Maine's third-party efficiency program administrator and expanding natural gas program eligibility. With funding set at levels that make achieving Maine's mandate to pursue all cost-effective efficiency measures possible, we once again consider the state for points in this section. Connecticut also passed notable legislation in 2013, closing the funding gap for achieving the state's all cost-effective energy efficiency mandate. With a secure and sufficient funding

[28] In its 2011 Integrated Resource Plan (TVA 2011), the Tennessee Valley Authority recommends increased use of energy efficiency and demand response resources, the use of which is estimated to achieve energy savings of approximately 11-14,000 GWh by 2020. Because TVA generates the vast majority of Tennessee's power, the state could receive points in this section in the future if the IRP recommendations are implemented.

[29] Utah has both a legislative goal (House Joint Resolution 9) and a Renewable Portfolio Goal (S.B. 202) that includes energy efficiency savings targets. Neither of these goals has been codified into regulatory language by the Public Service Commission, so they remain advisory, not binding.

mechanism in place, Connecticut is on a clear path toward implementing its energy savings targets.

Table 18. State Scores for Energy Efficiency Resource Standards

State	Approx. Annual Electricity Savings Target (2013+)	Cost Cap or Opt Out[1]	Natural Gas	Score (3 pts.)
Massachusetts	2.6%	Binding	•	3
Arizona	2.4%	Binding	•	3
Rhode Island	2.3%	Binding	•	3
New York	2.1%	Binding	•	3
Vermont	2.0%	Binding		3
Illinois	1.8%	Cost Cap	•	3
Maryland[2]	1.6%	Binding		3
Maine	1.6%	Opt Out	•	3
Minnesota	1.5%	Binding	•	3
Colorado	1.5%	Binding	•	3
Indiana	1.5%	Binding		3
Connecticut	1.4%	Binding	•	2.5
Iowa	1.4%	Binding	•	2.5
Oregon	1.0%	Binding	•	2.5
Washington	1.4%	Binding		2
Hawaii	1.4%	Binding		2
Ohio	1.2%	Binding		2
Arkansas	1.1%	Opt Out	•	2
New Mexico	1.0%	Binding		2
Michigan	1.0%	Cost Cap	•	2
California	0.9%	Binding	•	1.5
Wisconsin	0.7%	Cost Cap	•	1
Pennsylvania	0.8%	Cost Cap		0.5
North Carolina	0.5%	Opt Out		0.5
Nevada	0.2%	Binding		0
Texas	0.1%	Cost Cap, Opt Out		0

Note: [1]Though several states have loosely structured self-direct policies, we considered only true opt out programs in our scoring. [2]Only the portion of Maryland's target assigned to utilities is considered here.

Sources: See Appendix B

Long-term energy savings targets require leadership, sustainable funding sources and institutional support for states to achieve their goals. Several states currently have or have had in the past EERS-like structures in place, but have lacked one or more of these enabling elements, and thus have undercut the achievement of their savings goals. States in this situation have included Florida,[30] New Jersey, and Delaware, none of which has earned points in this category this year. On the whole, however, most states with EERS policies or other energy savings targets in place are currently meeting their goals and on are track to meet future goals.

Scoring on Financial Incentives Affecting Utility Investment in Efficiency: Earning a Return and Addressing Lost Revenues

Like an EERS, regulatory mechanisms that provide incentives and remove disincentives for utilities to pursue energy efficiency (i.e., performance incentives and decoupling/lost revenue adjustment mechanisms) are critical to leveraging energy efficiency funding and encouraging savings over the near and long terms. A state could earn up to three (3) points for having adopted financial incentive mechanisms for utilities' efficiency program for electric and natural gas and for having implemented decoupling to address lost revenues for its electric and natural gas utilities. States with a policy in place for at least one major utility were given credit. Information about individual state decoupling policies and financial incentive mechanisms is available on ACEEE's State Energy Efficiency Policy Database (ACEEE 2013). Details describing the scoring methodology are provided in Table 19.

[30] In Florida, cumulative energy savings targets of ~3.3% by 2019 remain in place for seven utilities (5 IOUs), but the Florida Public Service Commission approved program plans in 2011 for Progress Energy and Florida Power & Light, which represent three-quarters of electric load in the state, that will fall short of the targets. The five other utilities subject to targets are slated to meet their tailored utility targets.

Table 19. Scoring Methodology for Utility Financial Incentives

Scoring Criteria for Addressing Fixed Cost Recovery	Score
Decoupling has been established for at least one major utility, for both electric and natural gas.	1.5
Decoupling has been established for at least one major utility, either electric or natural gas. LRAM or ratemaking approach for recovery of lost revenues established for at least one major utility, for both electric and natural gas.	1
The legislature or commission has authorized or recommended decoupling within the last three years, but it has not yet been implemented. A lost revenue adjustment mechanism (LRAM) or ratemaking approach for recovery of lost revenues has been established for a major utility, for either electric or natural gas.	0.5
Scoring Criteria for "Performance Incentives"	**Score**
Performance incentives have been established for a major utility (or statewide independent administrator), for both electric and natural gas.	1.5
Performance incentives have been established for a major utility (or statewide independent administrator), for either electric or natural gas.	1
The legislature or commission has authorized or recommended a performance incentive within the last three years, but the use of a given mechanism has not yet been implemented.	0.5

This year's scores remain largely unchanged compared to last year, though there were some important steps forward in a handful of states. In states that were considering these policies some took positive action including Illinois, Missouri, Rhode Island, and Washington. The only state showing negative progress is Idaho, which continues to consider its options in a docket, but in the meantime has allowed its decoupling pilot to expire without renewal.

This year 30 states have a performance incentive in place or pending for electric utilities, up from 28 states last year. The number of states with a performance incentive in place or pending for gas utilities increased from 18 states last year to 21 this year.

The number of states with decoupling pending or in place for at least one major electric utility has stayed constant at 17, while the number of states with natural gas decoupled (or pending) for at least one major utility has increased from 19 to 21.

Table 20. Utility Efforts to Address Lost Revenues and Financial Incentives

	Decoupling or LRAM		Performance Incentives		
	Electric	Natural Gas	Electric	Natural Gas	Score (3 pts.)
California	Yes	Yes	Yes	Yes	3
Massachusetts	Yes	Yes	Yes	Yes	3
New York	Yes	Yes	Yes	Yes	3
Rhode Island	Yes	Yes	Yes	Yes	3
Wisconsin	Yes	Yes[3]	Yes	Yes	3
Alabama	Yes[2]	Yes[2]	Yes	Yes	2.5
Colorado	Yes[2]	Yes[2]	Yes	Yes	2.5
District of Columbia	Yes	No	Yes	Yes	2.5
Indiana	Yes[3]	Yes	Yes	No	2.5
Kentucky	Yes[2]	Yes[2]	Yes	Yes	2.5
Louisiana	Yes[2]	Yes[2]	Yes	Yes	2.5
Michigan	No	Yes	Yes	Yes	2.5
Minnesota	No	Yes	Yes	Yes	2.5
Missouri	Yes[2]	Yes[2]	Yes	Yes[1]	2.5
New Mexico	Yes[2]	Yes[2]	Yes	Yes	2.5
North Carolina	Yes[3]	Yes	Yes	No	2.5
Ohio	Yes[3]	Yes[2]	Yes	Yes	2.5
Oklahoma	Yes[2]	Yes	Yes	Yes	2.5
South Dakota	Yes[2]	Yes[2]	Yes	Yes	2.5
Arizona	Yes[2]	Yes[3]	Yes	No	2
Connecticut	Yes[3]	Yes[2]	Yes	Yes[1]	2
Hawaii	Yes	No	Yes	No	2
Arkansas	Yes[2]	Yes[2]	Yes[1]	Yes[1]	1.5
Delaware	Yes	Yes	No	No	1.5
Georgia	Yes[2]	No	Yes	No	1.5
Maryland	Yes	Yes	No	No	1.5
New Hampshire	No	No	Yes	Yes	1.5
Oregon	Yes	Yes	No	No	1.5
South Carolina	Yes[2]	No	Yes	No	1.5
Vermont	Yes[1]	Yes[2,1]	Yes	No	1.5
Washington	Yes	Yes	No	No	1.5
Illinois	No	Yes	No	No	1
Mississippi	Yes[2]	Yes[2]	Yes[1]	Yes[1]	1
Montana	Yes[2]	Yes[2]	No	No	1
Nevada	Yes[2]	Yes[3]	No	No	1
Texas	No	No	Yes	No	1
Utah	No	Yes	No	No	1

	Decoupling or LRAM		Performance Incentives		
	Electric	Natural Gas	Electric	Natural Gas	Score (3 pts.)
Virginia	No	Yes	No	No	1
Wyoming	Yes[2]	Yes	No	No	1
Kansas	Yes[2]	No	No	No	0.5
New Jersey	Yes[2,1]	Yes[2]	No	No	0.5
North Dakota	No	Yes[2]	No	No	0.5
Tennessee	No	Yes[2]	No	No	0.5
West Virginia	No	No	Yes[1]	No	0.5
Alaska	No	No	No	No	0
Florida	No	No	No	No	0
Idaho	No	No	No	No	0
Iowa	No	No	No	No	0
Maine	No	No	No	No	0
Nebraska	No	No	No	No	0
Pennsylvania	No	No	No	No	0

Notes: [1] Decoupling for electric or gas utilities, or both, or performance incentives are authorized according to legislation or commission order but are not yet implemented. [2] No decoupling, but some other mechanism for lost revenue adjustment. [3] Both decoupling and some other mechanism for lost revenue adjustment.

Potential Metrics

This year, we attempted to capture additional data for use in this chapter of the *State Energy Efficiency Scorecard*. Through our data request to state public utility commissions and energy offices, we also requested information on 2012 savings from efficiency programs and 2013 utility energy efficiency budgets. A comprehensive collection of these metrics would allow our judgment of states to be more current and precise. Thirty-two of the fifty states we surveyed responded with 2012 electric efficiency savings data. Twenty-six responded with 2013 electric efficiency program budget information. For natural gas programs, the response rate was somewhat lower. Twenty-six states responded with 2012 savings figures, while twenty offered 2013 budgets. This data is not scored, but is presented in Appendix H. In the future we will continue to work toward reporting the most up-to-date data possible.

Figure 3. Leading and Trending States: Utility and Public Benefits Programs

Massachusetts: Massachusetts has a long record of success in implementing energy efficiency programs, which are implemented by electricity and natural gas distributors. The state took a major leap forward in 2008, when it passed the Green Communities Act, which established energy efficiency as the "first-priority" energy resource and created an Energy Efficiency Advisory Council to collaborate with utilities to develop statewide efficiency plans in three-year cycles. The first three-year plan aimed to achieve annual electric savings equal to 2.4% of sales and annual natural gas savings equal to 1.5% of sales in 2012, making it one of the most aggressive EERS targets in the nation. In late 2012, Massachusetts finalized its second three-year plan for statewide energy efficiency programs. The plan sets electricity targets of 2.5–2.6% and natural gas targets of 1.08-1.19% from 2013 to 2015.

Vermont: Vermont pioneered the third-party administration model of implementing energy efficiency programs, which has been replicated in many states, including Maine, New Jersey, Delaware, Oregon, and the District of Columbia. Efficiency Vermont, the state's "energy efficiency utility," runs energy efficiency programs for a wide range of customers and leads the nation in producing consistent energy savings. Vermont's excellent performance is due in large part to a strategic commitment by the Vermont Public Service Board to fund programs at aggressive levels in order to reach new customers and achieve deep savings. The Public Service Board has also put in place an optimal mix of policies, including an EERS and performance incentives to encourage successful programs.

Michigan: Michigan utility sector energy efficiency programs are in the midst of a multi-year resurgence, following several years of minimal program activity. Michigan is one of several large Midwestern states with substantial manufacturing bases, including Illinois and Ohio, currently ramping up energy savings to meet requirements of EERS targets established in 2007 and 2008. While Michigan's EERS has an annual (first year) net savings level that tops out at 1%, and other states' grow to 1.5% or 2%, the EERS in Michigan applies to all utilities, not only regulated investor-owned utilities. The Commission has approved financial incentive mechanisms that encourages utilities to pursue cost effective energy efficiency programs that significantly exceed the statutory minimum targets. Michigan reported net electric energy savings for 2012 up 16% above those from 2011. This was on top of a statewide increase of 26% from 2010 to 2011.

Connecticut: Connecticut may be on the move as House Bill 6360, An Act Concerning Implementation of Connecticut's Comprehensive Energy Strategy, passed on June 5, 2013 contains numerous provisions related to energy efficiency. While a law requiring all cost-effective energy efficiency has been on the books in the past but not implemented, the new act passed this year allows funding for cost-effective electric energy efficiency to increase to double the current base rate of 3 mills charged on customer bills, potentially up to 6 mills. The new bill also requires implementation of decoupling for gas and electric utilities, loan funding for residential energy efficiency, and mandates "tailored targets" by having gas companies and electric distribution companies to create energy conservation plans every three years.

Maine: Efficiency Maine was established in 2002, funded through system benefits charges and the Regional Greenhouse Gas Initiative. The independent trust operates under a mandate to pursue all cost effective efficiency measures. Efficiency Maine suffered from funding shortfalls in recent years, but full funding was restored in June 2013 with the passage of LD 1559. Natural gas efficiency programs were also expanded during 2013. The trust pursues a variety of strategies to meet its energy efficiency goals, including technical assistance, cost-sharing, training, education, and awareness programs.

Chapter 3: Transportation Policies

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INTRODUCTION

The energy efficiency score for the transportation category is based on a review of state actions that go beyond federal policies to achieve a more energy-efficient transportation sector. These may be actions to improve the efficiency of vehicles purchased or operated in the state, policies to increase the use of more efficient modes of transportation, or the integration of land use and transportation planning so as to reduce the need to drive.

Tailpipe Emission Standards

Vehicles' greenhouse gas (GHG) emissions are largely proportional to their fuel use. In 2002, California passed the Pavley Bill (AB1493), the first U.S. law to address GHG emissions from vehicles. The law required the California Air Resources Board to regulate GHGs as part of the California Motor Vehicle Program. In 2004, the California Air Resources Board adopted a rule requiring automakers to begin in the 2009 model year to phase in lower-emitting cars and trucks that will collectively emit 22% lower levels of GHGs in model year 2012 than 2002-model-year vehicles and 30% lower levels in model year 2016. The GHG reductions are being achieved largely through improved fuel efficiency, making these standards, to a large degree, energy efficiency policies.

States may choose to adopt either the federal vehicle emissions standards or California's. Fourteen states and the District of Columbia have adopted California's GHG regulations in addition to California. These include Connecticut, Delaware, the District of Columbia, Florida, Maine, Maryland, Massachusetts, New Jersey, New Mexico, New York, Oregon, Pennsylvania, Rhode Island, Vermont and Washington (Clean Cars Campaign 2013).

In 2010, the Environmental Protection Agency (EPA) and the U.S. Department of Transportation (DOT) issued harmonized national standards for fuel economy and GHG emissions for model years 2012 to 2016, matching California's GHG tailpipe standards in stringency and calling for a fleet-wide average fuel economy of 34.1 miles per gallon by 2016.

As a longtime leader in the vehicle emissions standard setting process, California has been instrumental in prodding the federal government to establish a trajectory of continuing improvement that helps to draw new efficiency technologies into the market. The state's success in this role is due in part to auto manufacturers' preference for minimizing the number of distinct regulatory regimes for vehicles. In 2012, the California Air Resources Board adopted new GHG standards for model years 2017 to 2025. The DOT and EPA subsequently finalized new standards as well, calling for a fleet-wide average between 48.7 and 49.7 miles per gallon by 2025. The three programs are now harmonized, but California has, in addition, an updated zero-emission vehicle (ZEV) program that requires increasing production of plug-in hybrid and fuel-cell vehicles from 2018 to 2025

Integration of Policies for Land Use and Transportation Planning

Sound land use planning is vital to support alternatives to driving in the United States. Successful strategies for changing land use patterns in order to reduce the need to drive vary widely among states due to differences in their existing infrastructure, geography, and political structure; however, core principles of smart growth need to be embodied in state comprehensive plans. Energy-efficient transportation is inherently tied to the integration of transportation and land use policies, and for a state to reduce vehicle miles traveled, it must have an approach to planning that successfully addresses land use and transportation considerations simultaneously. Such an approach includes measures that encourage the creation of:

- Transit-oriented development, including mixed land uses (mix of jobs, stores, and housing) and good street connectivity that makes neighborhoods friendly to all modes of transportation
- Areas of compact development
- Convenient modes of transportation that provide alternatives to automobiles
- Centers of activity where popular destinations are close together

Vehicle Miles Traveled Reduction Targets

Increasing vehicle fuel economy will not adequately address energy use in the transportation sector in the long term if growth in total vehicle miles traveled goes unchecked. While vehicle miles traveled on U.S. highways have not increased in recent years, an economic recovery could bring a return to an upward trend. Projections by the Energy Information Administration (EIA) predict a 26% increase in light-duty vehicle miles traveled between now and 2030, substantially outpacing anticipated population growth in the United States (EIA 2013c). Other analyses indicate, however, that the plateau in growth rates for vehicle miles traveled may persist. Relatively high fuel prices, and gradually rising mode shares for public transit, biking, and walking after years of decline could sustain a reduced rate of growth in vehicle miles traveled into the future (Dutzik and Baxandall 2013).

In any case, reducing vehicle miles traveled is a key component of managing transportation energy use. Achieving an ambitious vehicle miles traveled reduction target requires the coordination of transportation and land use planning. State and local governments play vital roles in this coordination.

State Transit Funding

While states receive some federal funds for public transit, they provide a significant proportion of transit funding from their own budgets. A state's investment in public transit is a key indicator of its interest in promoting energy-efficient modes of transportation, although realizing the potential for energy savings through transit typically requires land use planning changes as well.

Dedicated Transit Revenue Stream

As states find themselves faced with increasingly uncertain federal funding streams and federal transportation policies that remain highway-focused, they are taking the lead when it comes to finding dedicated funding sources for long-term public transit expenditures.

To generate a sustainable stream of capital and operating funds, a number of states have adopted legislation that identifies specific sources of funding for public transit and other alternatives to highway modes of transportation. North Carolina, for instance, established an intermodal transportation fund in 2009 that allocates money to local governments for the express purpose of maintaining and developing public transportation systems. Likewise, in 2010 the state of New York passed Assembly Bill 8180, which directs certain vehicle registration and renewal fees toward public transportation.

Not only do such bills enable the growth of multimodal transit facilities, they can lead to environmental benefits from reduced vehicle emissions and can encourage economic development around transportation nodes in expanded transit networks.

Complete Streets Policies

Complete streets policies focus on the interconnectivity of streets and aim to create safe, easy access to roads by all pedestrians, bicyclists, motorists, and public transportation users. Complete streets foster increased use of alternative modes of transportation to driving and, therefore, can have a significant impact on a state's fuel consumption. According to the National Complete Streets Coalition, modest increases in biking and walking can potentially save 2.4 billion gallons of fuel annually across the country (NCSC 2012b). A complete streets policy directs states' transportation agencies to evaluate and incorporate complete streets principles. Transportation planners are tasked with ensuring that all roadway infrastructure projects allow for equitable access and use of those roadways.

Incentives for High-Efficiency Vehicles

The high cost of advanced-technology fuel-efficient vehicles is a major barrier to their entry into the marketplace. To encourage consumers to purchase these vehicles, states may offer a number of financial incentives, including tax credits, rebates, and sales tax exemptions. In the *State Scorecard,* we focus on policies that specifically promote fuel-efficient vehicles. Several states offer tax incentives to individual purchasers of alternative-fuel vehicles, which typically include vehicles that run on compressed natural gas, ethanol, propane, or electricity, and in some cases hybrid vehicles (electric or hydraulic). While alternative-fuel vehicles can provide substantial environmental benefits by reducing pollution, they do not necessarily mean increased fuel efficiency, and policies to promote their purchase therefore are not specifically included in the *State Scorecard*. However, electric vehicles and hybrids typically do have higher fuel efficiency. Furthermore, with the arrival of a wide range of plug-in vehicles in recent years, tax credits for electric and hybrid vehicles are playing an important role in spurring their adoption.

A state "feebate" policy that provides a rebate or charges a fee for the purchase of a vehicle, depending on its fuel efficiency, would also receive credit in our scoring of transportation policies. However, although several states have considered feebates, none has yet put such a policy in place. We do not give credit for incentives for the use of high occupancy vehicle lanes and preferred parking programs for high-efficiency vehicles, as they may promote automobile use and consequently have questionable net energy benefit. Additionally, a number of states (e.g., Virginia and North Carolina) have adopted or are exploring the implementation of fees on hybrid and electric vehicles as a way to recoup lost gasoline tax

revenues. We plan to evaluate these policies for possible inclusion in the 2014 edition of the *State Scorecard*.

METHODOLOGY & RESULTS

States could earn up to nine (9) points in this chapter, based on their performance in seven metrics. Scoring methodology is described below, and results are presented in Table 21.

Major steps have been taken recently at the federal level to reduce fuel consumption in the United States. In 2012, the EPA and DOT finalized new GHG and fuel economy standards for model year 2017 to 2025 light-duty vehicles and model year 2014 to 2018 heavy-duty vehicles. Nevertheless, states continue to play a crucial role in driving improvements in vehicle fuel economy. Consequently, states that have chosen to adopt California's GHG tailpipe emissions standards earned two (2) points in this chapter. Additionally, states with consumer incentives for the purchase of high efficiency vehicles were awarded one-half (0.5) point.

States lead the way in improving not only fleets, but also the efficiency of transportation systems more broadly. Several states have made significant progress towards developing financially stable, comprehensive transit systems. Illinois more than doubled its per capita spending on transit from fiscal year 2010 to fiscal year 2011. Spending increased from approximately $46 per capita to almost $103 per capita. Indiana, Virginia, and Washington all adopted some form of transit legislation in late 2012 or early 2013, providing sustainable funding sources for the expansion and maintenance of transit facilities. Policies adopted in Indiana and Virginia directed revenues from sales tax implementation towards public transit facilities while Washington's new legislation created a transit service mitigation program that provides grants to transit agencies in the state. States that have adopted legislation that provides a dedicated stream of revenues for transit investment earn one (1) point in this year's *State Scorecard*. Currently, 16 states have such legislation in place. For details, see Appendix D. States also receive points based on the magnitude of their transit spending: relatively large investments (of $50 per capita or more) received one (1) point, while investments ranging from $20 to $50 per capita received one-half (0.5) point.

Policies to promote compact development and ensure the accessibility of major destinations are essential to reducing energy use in transportation in the long term. Given the significant energy savings potential of these policies, states with codified growth management legislation that identify specific growth boundaries scored one (1) point, as did those with smart growth statutes, which includes the creation of zoning overlay districts such as the Massachusetts Chapter 40R program, as well as various other incentives to encourage sustainable growth. For further detail, refer to ACEEE's *State Energy Efficiency Policy Database* (ACEEE 2013).Those adopting targets for vehicle miles traveled statewide were also eligible for two (2) points. This year two more states earned points for their targets: Oregon and Maine. We also awarded one-half (0.5) point to states with complete streets legislation that ensures proper attention to the needs of pedestrians and cyclists in all road projects.

Table 21. State Scoring on Transportation Policies

State	GHG Tailpipe Emissions Standards (2 pts.)[1]	Integration of Transportation and Land Use Planning (2 pts.)[2]	VMT Targets (2 pts.)[3]	Transit Funding (1 pt.)[4]	Dedicated Transit Revenue Stream Legislation (1 pt.)[5]	Complete Streets Legislation (0.5 pt.)[6]	High-Efficiency Vehicle Consumer Incentives (0.5 pt.)[7]	Total Score (9 pts.)
New York	2	1	2	1	1	0.5	0.5	8
California	2	1	2	0.5	1	0.5	0.5	7.5
Massachusetts	2	1	2	1	1	0.5	0	7.5
Oregon	2	2	2	0.5	0	0.5	0	7
Washington	2	1	2	0	1	0.5	0.5	7
Maine	2	2	2	0	0	0	0	6
Maryland	2	2	0	1	0	0.5	0.5	6
New Jersey	2	2	0	1	0	0.5	0.5	6
Pennsylvania	2	1	0	1	1	0.5	0.5	6
Connecticut	2	2	0	1	0	0.5	0	5.5
Delaware	2	2	0	1	0	0.5	0	5.5
Rhode Island	2	2	0	1	0	0.5	0	5.5
Florida	2	1	0	0	1	0.5	0	4.5
Vermont	2	2	0	0	0	0.5	0	4.5
Illinois	0	1	0	1	1	0.5	0.5	4
District of Columbia	2	0	0	1	0	0	0.5	3.5
Georgia	0	1	0	0	1	0.5	0.5	3
Michigan	0	1	0	0.5	1	0.5	0	3
Tennessee	0	1	0	0	1	0.5	0	2.5
Hawaii	0	2	0	0	0	0.5	0	2.5
North Carolina	0	1	0	0	1	0.5	0	2.5
Virginia	0	1	0	0.5	0.5	0.5	0	2.5
Arizona	0	2	0	0	0	0	0.5	2.5
Colorado	0	0	0	0	1	0.5	0.5	2
Iowa	0	1	0	0	1	0	0	2
Minnesota	0	0	0	0.5	1	0.5	0	2
New Mexico	2	0	0	0	0	0	0	2
West Virginia	0	0	0	0	1	0.5	0	1.5
Alaska	0	0	0	1	0	0	0	1
Kansas	0	0	0	0	1	0	0	1
Louisiana	0	0	0	0	0	0.5	0.5	1
Montana	0	1	0	0	0	0	0	1
New Hampshire	0	1	0	0	0	0	0	1
North Dakota	0	1	0	0	0	0	0	1
South Carolina	0	0	0	0	0	0.5	0.5	1

State	GHG Tailpipe Emissions Standards (2 pts.)[1]	Integration of Transportation and Land Use Planning (2 pts.)[2]	VMT Targets (2 pts.)[3]	Transit Funding (1 pt.)[4]	Dedicated Transit Revenue Stream Legislation (1 pt.)[5]	Complete Streets Legislation (0.5 pt.)[6]	High-Efficiency Vehicle Consumer Incentives (0.5 pt.)[7]	Total Score (9 pts.)
Wisconsin	0	0	0	0.5	0	0.5	0	1
Texas	0	0	0	0	0	0.5	0.5	1
Mississippi	0	0	0	0	0	0.5	0	0.5
Oklahoma	0	0	0	0	0	0	0.5	0.5
Utah	0	0	0	0	0	0	0.5	0.5
Indiana	0	0	0	0	0	0	0	0
Alabama	0	0	0	0	0	0	0	0
Arkansas	0	0	0	0	0	0	0	0
Idaho	0	0	0	0	0	0	0	0
Kentucky	0	0	0	0	0	0	0	0
Missouri	0	0	0	0	0	0	0	0
Nebraska	0	0	0	0	0	0	0	0
Nevada	0	0	0	0	0	0	0	0
Ohio	0	0	0	0	0	0	0	0
South Dakota	0	0	0	0	0	0	0	0
Wyoming	0	0	0	0	0	0	0	0

Sources and Notes: [1] Clean Cars Campaign (2013); [2] State legislation; [3] State legislation and Center for Climate and Energy Solutions (2012); [4] AASHTO (2013), see Appendix D for a complete description of state transit funding; [5] State legislation; [6] NCSC (2012a); [7] DOE (2013a).

Table 22 outlines the consumer incentives available for the purchase of high-efficiency vehicles, by state.

Table 22. State Purchase Incentives for High-Efficiency Vehicles

State	Tax Incentive
Arizona	Electric vehicles in Arizona pay a significantly reduced vehicle license tax as part of the state's Reduced Alternative Fuel Vehicle License Tax program. The vehicle license tax on an AFV is $4 for every $100 in assessed value.
California	AB 118 funds a voucher program, targeted at medium- and heavy-duty trucks, whose goal is to reduce the upfront incremental cost of purchasing a hybrid vehicle. Vouchers range from $6,000 to $45,000, depending on vehicle specifications, and are paid directly to fleets that purchase hybrid trucks for use within the state. California also offers tax rebates of up to $2,500 for light-duty zero emission electric vehicles and plug-in hybrid electric vehicles on a first come, first served basis, effective until 2015. .
Colorado	In 2013, Colorado extended out to 2021 financial incentives available for purchasers of high-efficiency vehicles. Consumers can claim up to $6,000 for the purchase of a plug-in or hybrid vehicle. Individuals that convert a personal vehicle to plug-in hybrid technology can claim up to $7,500.
District of Columbia	The Department of Motor Vehicles Reform Amendment Act of 2004 exempts owners of hybrid-electric and all-electric vehicles from the vehicle excise tax and reduces the vehicle registration charge.
Georgia	An income tax credit is available to individuals who purchase or lease a new Zero Emission Vehicle (ZEV). A ZEV vehicle is defined as a vehicle that has zero tailpipe and evaporative emission. The amount of the tax credit is 20% of the vehicle cost, up to $5,000
Illinois	Residents of Illinois may claim a rebate for 80% of the incremental cost of purchasing an electric vehicle (up to $4,000) as part of the Illinois Alternative Fuels Rebate Program.
Louisiana	Louisiana offers an income tax credit equivalent to 50% of the incremental cost of purchasing an electric vehicle under the state's alternative fuel vehicle tax credit program. Alternatively, taxpayers may claim the lesser of 10% of the total cost of the vehicle or $3,000.
Maryland	Purchasers of qualifying all-electric and plug-in hybrid-electric light-duty vehicles may claim up to $1,000 against the vehicle excise tax in the state of Maryland. Vehicles must meet certain speed, weight, and motor requirements to qualify.
New Jersey	All zero emission vehicles in the state of New Jersey are exempt from state sales and use taxes.
New York	The state of New York started the New York Truck Voucher Incentive Program this year. Vouchers of up to $40,000 are available for the purchase of hybrid and all-electric class 3-8 trucks.
Oklahoma	A one-time tax credit equal to 50% of the incremental cost of purchasing an electric vehicle is available to residents of Oklahoma. If the incremental cost of the vehicle cannot be determined, the state will provide a tax credit equivalent to 10% of the total purchase price of an electric vehicle (up to $1,500). The program expires January 1, 2015.
Pennsylvania	The state's Alternative Fuels Incentive Grant Program provides rebates of up to $3,000 for qualifying electric and plug-in hybrid vehicles.

State	Tax Incentive
South Carolina	South Carolina offers up to $2,000 in tax credits for the purchase of a plug-in hybrid-electric vehicle. The credit is equal to $667, plus $111 if the vehicle has at least 5 kilowatt-hours (kWh) of battery capacity, and an additional $111 for each additional kWh above 5 kWh.
Texas	Electric vehicles that weigh 8,500 lbs. or less and are purchased after September 1st, 2013 are eligible for a $2,500 rebate.
Utah	Until December 31, 2014, electric vehicles qualify for up to $605 in tax credits.
Washington	Electric vehicles are exempt from state motor vehicle sales and use taxes under the Alternative Fuel Vehicle Tax Exemption Program.

Source: DOE (2013a)

Potential Future Metrics

In an effort to continually improve our scoring methodology, ACEEE is considering including additional performance and policy metrics to the transportation section of the *State Scorecard*. While these metrics are not a part of the rankings this year, descriptions of each are included below to solicit feedback from states regarding their applicability.

Vehicle Miles Traveled Per Capita

The success of transportation efficiency policies will ultimately be measured by the resulting change in VMT. In states that work to change land use patterns, encourage the use of alternative modes of transport, and use transportation demand management strategies, people will begin to drive less. While the United States as a whole has seen a reduction in annual miles driven by the average driver in recent years, this trend is not necessarily representative of changes in VMT in every state.

In order to compare progress across states of widely varying population and population density, we propose to score states on the percentage change in VMT per capita over a five-year period. This time scale will capture to some extent the lag time between implementation of travel efficiency policies and the actual reduction in miles traveled. We plan to base states' scores on data from the Federal Highway Administration's Highway Statistics series. Data for the 2007 to 2011 period are shown below in Table 23. We welcome suggestions for how best to normalize these data to account for the impact on VMT of economic fluctuations.

Figure 4. Leading States: Transportation Policies

New York: New York has steadily moved up the ranks in recent years with its strong efforts toward transportation efficiency. Ranked second this year, the state has made a number of recent changes targeted at reducing fuel consumption in the transportation sector. New York is one of the few states in the nation to have a concrete VMT reduction target. A goal set in 2008 calls for a 10% reduction in ten years.

Additionally, the state passed Assembly Bill 8180 in 2010 directing a portion of vehicle registration and license renewal fees to public transportation. The bill also created the Metropolitan Transit Authority Financial Assistance Fund to support subway, bus and rail service and capital improvements. In 2011 New York adopted a new "complete streets" policy, aimed at providing accessibility for multiple modes of transport. Finally, the state of New York implemented the New York Truck Voucher Incentive Program in 2013. Vouchers of up to $40,000 are available for the purchase of hybrid and all-electric class 3-8 trucks.

California: As part of its plans to implement AB 32, which requires a 25% reduction from 1990 levels in GHG emissions by 2020, California has identified several strategies for smart growth and reduction of VMT. In 2008, the state passed SB 375, which requires the California Air Resources Board to develop regional transportation-specific GHG reduction goals in collaboration with metropolitan planning organizations. These goals must subsequently be reflected by regional transportation plans that create compact, sustainable development across the state and thus reduce the growth of VMT. The California Air Resources Board finalized targets in 2011 that recommended a 5–8% reduction in vehicle-associated GHG emissions by 2020 for the four largest metropolitan planning organizations in the state (CARB 2011).

Additional efforts to reduce VMT include the passage of California's Transportation Development Act, which provides two sources of funding for public transit: the Location Transportation Fund and the State Transit Assistance Fund. Monies are allocated to each county based on population, taxable sales, and transit performance and are used for the development and maintenance of transit infrastructure.

On the vehicle efficiency side, California passed AB 118 in 2009, a "clean transportation" program that includes funding for a hybrid vehicle voucher program targeted at medium- and heavy-duty vehicles. The goal of the Hybrid Truck and Bus Voucher Incentive Project is to reduce the high upfront costs associated with the purchase of high-efficiency vehicles. The program is currently in its fourth year. Rebates range from $8,000 to $65,000 per vehicle depending on vehicle specification. A "plus-up" program is available in the San Joaquin Valley that can add an additional $30,000 to the value of the voucher. California also offers tax rebates of up to $5,000 for light-duty zero-emission electric vehicles and plug-in hybrid-electric vehicles.

Oregon: The state of Oregon has made steady progress toward reducing its fuel consumption and VMT in recent years. In 2011, Oregon adopted transportation-specific GHG reduction goals for six of its largest metropolitan areas, calling for a reduction of 17% to 21% below 2005 levels by 2035. In combination with the state's stringent growth management act, these new goals have helped to move Oregon toward the top of the rankings in this policy area.

The state also passed HB 2186 in 2009 calling for all metropolitan planning organizations to have create a GHG emissions task force that looks for alternative land use and transportation planning scenarios that would meet community growth needs while reducing GHG emissions across the state.

Transit Ridership

Transit ridership is a key performance metric for state policies to encourage the use of alternative modes of transportation and to achieve an efficient transportation system. Transit ridership has increased significantly in recent years nation-wide. According to the American Public Transportation Association, the number of individuals taking some form of public transportation rose by 30% between 2000 and 2012 (APTA 2012). This increase may have been spurred by residents' growing preference for downtown, transit-oriented living in communities across the country (T4A 2012).

Increased transit ridership can also result from a number of targeted state policies. Strategies such as transit fare adjustments, service coordination and educational campaigns can all make public transit a much more attractive option for the average commuter. Likewise, ensuring that a given transit network is well-connected and funded by a sustainable financing source ensures future VMT reduction. We propose to score states on the change in annual trips per urban resident between 2008 and 2011. This allows for a more meaningful comparison across states with different levels of urbanization. Table 23 shows the data for each state for the change between years 2008 and 2011.

Adoption of Electric Vehicles and Infrastructure Support

As more electric vehicles become available to drivers, states have a significant role to play in overcoming the barriers to their widespread adoption. States can provide a number of financial benefits to encourage the purchase of electric vehicles as well as the construction of the required fueling infrastructure by reducing the high upfront costs associated with these products. Additionally, non-financial benefits such as emissions testing exemptions make it more convenient to own an electric vehicle.

Table 23 shows the number of electric vehicle charging stations located in each state and the number of electric vehicles currently registered in each state.[31] We propose to use these metrics to measure the state's investment and success in making electric vehicles a feasible vehicle option. We will consider including a metric that measures utility company electric vehicle preparedness as well.

Freight

Many states, though not all, have freight transportation plans in place. With the passage of the 2012 federal transportation funding authorization bill MAP-21, the U.S. DOT now requires that states have such plans in place in order to be eligible for a 95% federal match on freight projects. MAP-21 also requires that plans include a description of the freight policies, strategies, and performance measures that will guide the freight-related transportation investment decisions of the State (MAP-21, Section 1118).

We propose to assign points based on two considerations relating to state freight plans: first, whether the plan includes an energy efficiency performance measure, and second, whether the plan includes concrete steps to improve modal balance which means taking steps to

[31] EV registrations shown are EIA's estimates based on a fleet survey. If possible, we will base this metric on actual data in 2014.

optimize the use of all freight modes, including energy-efficient modes such as rail and waterborne freight. We may use these considerations in two separate metrics or combine them into a single metric.

1. Energy efficiency performance measure—The adoption of energy efficiency as a performance measure should mean tracking and reporting the energy efficiency of freight movement in the state as a whole, as well as the use of energy efficiency as a criterion for selecting freight projects. Energy efficiency performance targets may be formulated in terms of gallons per ton-mile of freight moved and should reflect performance across all freight modes. Closely related performance measures such as grams of GHG emitted per ton-mile of freight will be eligible for points under this metric as well.

2. Measures to improve modal balance. A state's plan will be considered for points under this metric if it establishes targets for freight mode split or commits to achieving robust rail or waterborne freight systems through other means, such as funding targets or the inclusion of a particular multimodal network of freight facilities.

Table 23. Data for Proposed Transportation Performance Metrics

State	Vehicle Miles Traveled per Capita (% change 2007-2011)[1]	Public Transit Ridership (change in trips per capita 2008-2011)[2]	Electric Vehicle Registrations per 100,000 People (2011)[3]	Electric Vehicle Charging Locations per 100,000 people[4]
Alabama	2.1%	-0.3	11.8	0.5
Alaska	-16.0%	-0.4	7.7	0.1
Arizona	-6.9%	0.9	74.6	3.7
Arkansas	-3.9%	0.3	4.8	0.6
California	-6.1%	-3.3	92.9	3.6
Colorado	-9.4%	-2.2	5.7	1.7
Connecticut	-5.3%	-0.3	4.2	2.3
Delaware	-9.3%	1.1	0.0	0.8
District of Columbia	-6.3%	-44.4	57.2	5.5
Florida	-10.8%	-0.5	4.0	2.1
Georgia	-6.4%	-2.3	6.8	1.4
Hawaii	-9.8%	-3.7	29.5	9.7
Idaho	-4.4%	0.6	3.2	0.3
Illinois	-4.6%	-0.4	2.0	1.7
Indiana	4.2%	-0.9	0.2	1.0
Iowa	-2.7%	1.8	2.9	1.3
Kansas	-3.4%	0.7	7.3	1.5
Kentucky	-2.5%	-0.8	2.7	0.5
Louisiana	-1.9%	1.1	13.4	0.5
Maine	-6.0%	0.0	1.3	1.1
Maryland	-4.0%	-1.3	21.6	3.2

State	Vehicle Miles Traveled per Capita (% change 2007-2011)[1]	Public Transit Ridership (change in trips per capita 2008-2011)[2]	Electric Vehicle Registrations per 100,000 People (2011)[3]	Electric Vehicle Charging Locations per 100,000 people[4]
Massachusetts	-2.1%	0.5	27.7	2.7
Michigan	-7.8%	0.0	11.8	2.3
Minnesota	-3.8%	-0.2	3.7	1.2
Mississippi	-12.0%	0.2	5.8	0.5
Missouri	-2.2%	-3.6	3.9	0.9
Montana	-1.1%	0.7	3.1	0.1
Nebraska	-5.6%	0.0	1.0	0.6
Nevada	3.1%	-5.3	8.5	1.3
New Hampshire	-5.5%	2.3	5.2	1.1
New Jersey	-6.2%	-3.4	3.6	0.9
New Mexico	-9.9%	1.5	4.2	0.6
New York	-7.0%	-1.2	34.8	1.1
North Carolina	-5.9%	0.6	13.2	1.7
North Dakota	8.5%	0.9	0.0	0.3
Ohio	1.1%	-2.5	2.7	0.7
Oklahoma	-4.8%	-0.2	13.3	0.4
Oregon	-7.3%	-0.3	29.1	8.7
Pennsylvania	-10.3%	-0.1	0.9	0.9
Rhode Island	-8.1%	-2.5	36.9	1.0
South Carolina	-9.7%	0.1	8.0	2.4
South Dakota	-3.3%	0.3	3.8	0.5
Tennessee	-4.1%	-0.3	7.4	4.7
Texas	-9.3%	-1.4	8.1	1.9
Utah	-7.5%	0.2	5.6	1.4
Vermont	-8.1%	0.7	95.9	2.9
Virginia	-6.0%	-1.1	9.7	1.4
Washington	-5.2%	-2.2	5.6	5.3
West Virginia	-10.0%	0.3	3.3	0.7
Wisconsin	-10.3%	-1.7	1.0	1.6
Wyoming	-8.9%	-0.1	3.2	0.2

Source: [1] DOT (2013a); [2]DOT (2013b); [3] EIA (2013d); [4]DOE (2013b)

Chapter 4: Building Energy Codes

Author: Max Neubauer

INTRODUCTION

Buildings consume 74% of electricity and 41% of total energy used in the United States, and account for 40% of U.S. carbon dioxide emissions (DOE 2011a). This makes buildings an essential target for energy savings. However, because buildings have long lifetimes and are not easily retrofitted, it is crucial to encourage building efficiency measures during construction. Mandatory building energy codes are one way to target energy efficiency by requiring a minimum level of energy efficiency for new residential and commercial buildings.

In 1978, California enacted the first statewide building energy code in its Title 24 Building Standard. Several states (including Florida, New York, Minnesota, Oregon, and Washington) followed with state-developed codes in the 1980s. During the 1980s and 1990s, the International Code Council (ICC) and its predecessor developed the Model Energy Code (MEC), later renamed the International Energy Conservation Code (IECC). Today, most states use a version of the MEC or IECC for their residential building code, which requires a minimum level of energy efficiency in new residential construction. Most commercial building codes are based on ASHRAE 90.1, jointly developed by the American Society of Heating, Refrigerating and Air Conditioning Engineers (ASHRAE) and the Illuminating Engineering Society (IES). The IECC commercial building provisions also include prescriptive and performance requirements based primarily on ASHRAE requirements.

The most recent versions of the IECC and ASHRAE codes for which the Department of Energy (DOE) has completed its determination process are the 2012 IECC and the ASHRAE 90.1-2010 standards. California, Illinois, Maryland, Massachusetts and Rhode Island have officially adopted the latest standards for both residential and commercial buildings. Mississippi recently adopted the ASHRAE 90.1-2010 standard for both commercial and state-owned buildings, making it the first state in the Southeast to do so. North Carolina and Oregon have also adopted ASHRAE 90.1-2010 for commercial buildings. Several states are in the process of adopting or updating to the most recent building energy codes.

Historically, the commercial provisions in the IECC have consistently differed from those in ASHRAE 90.1 so that the ASHRAE 90.1 standard has generally been considered to be more stringent. According to a DOE analysis comparing the 2012 IECC and ASHRAE 90.1-2010, both exceed the energy savings of ASHRAE 90.1-2007 and the 2009 IECC; therefore, their adoption meets or exceeds the standards referenced in the American Recovery and Reinvestment Act (ARRA) (see the ARRA section below). Therefore, states can adopt either commercial provision and still meet the requirements stipulated in ARRA (DOE 2011b).

The Department of Energy's Building Code Determinations

With the publication of each new edition of the IECC and ASHRAE standards, DOE issues determinations on the codes to ascertain their relative impact when compared to older versions and, if justified, establish the latest iteration as the base code with which all states must comply. While no enforcement mechanism is in place to address non-compliance,

states are required to send letters either certifying their compliance, requesting an extension, or explaining their decision not to comply within two years of the final determination.

On May 17, 2012, the DOE issued its final determination on the 2012 IECC, reporting that the 2012 IECC achieves greater energy efficiency than its predecessor editions (DOE 2012). DOE estimates that the 2012 IECC achieves about 20% greater site energy savings than the 2009 IECC (DOE 2012). States were required to file certification statements with DOE by July 19, 2013.

On October 19, 2011, the DOE issued its final determination on ASHRAE Standard 90.1-2010, reporting that ASHRAE 90.1-2010 achieves greater energy efficiency than its predecessor editions, generating 18.2% greater site energy savings than ASHRAE 90.1-2007 (DOE 2011b). States needed to file certification statements with DOE by October 18, 2013. States may elect to file a single certification to address both Standard 90.1-2007 and Standard 90.1-2010 determinations. The certification must be filed by July 20, 2013.

Building Codes and the American Recovery and Reinvestment Act

The impact of ARRA on building code adoption has shown that federal policy can catalyze tremendous progress at the state level. The appropriation of stimulus funding through DOE's State Energy Program has spurred the majority of states to adopt the 2009 IECC and ANSI/ASHRAE/IESNA Standard 90.1-2007 (hereafter referred to as the "ARRA codes").

In this year's *State Scorecard*, 40 states and the District of Columbia have either adopted or are on a clear path towards the adoption of codes at least equivalent to the ARRA codes for either residential or commercial buildings, or both. Additionally, there are jurisdictions in most "home rule" states—where adoption and enforcement are under the control of local jurisdictions—that have adopted codes at least equivalent to the ARRA codes.[32] Undoubtedly, ARRA has served as a major catalyst in the adoption of building codes across the country. While a few states still have not yet complied with the ARRA requirements, the vast majority of new construction across the country, both residential and commercial, is subject to compliance with the ARRA codes.

Some states have acknowledged the value of regularly adopting the latest iterations of the IECC and ASHRAE 90.1 code standards and have already moved beyond the ARRA codes, having either adopted the 2010/2012 code iterations or begun the process toward adoption. Some states have also adopted mandatory codes where there were none previously in place. While these efforts to adopt stringent building energy codes are laudable, the key to ensuring that states will reap the benefits of their proactivity lies in the implementation of the codes. As a result, DOE designated the six regional energy efficiency organizations as support organizations to states in their geographic areas to aid with adoption and compliance efforts.

[32] Home rule decentralizes power, allowing localities to exercise certain powers of governance within their own administrative area.

ARRA and Building Code Compliance

ARRA called for states to achieve 90% compliance with the ARRA minimum standard building energy code (2009 IECC for residential; ASHRAE 90.1-2007 for commercial) by 2017. While some states have made progress in funding and training code officials to ensure enforcement, for all states to attain the 90% compliance goal will require a much more concerted effort on the part of states, utilities, and other stakeholders, incorporating facets beyond training.

A variety of methods exist to increase compliance with building codes, many of which are promoted and facilitated by the Building Codes Awareness Project (BCAP). The project began its Compliance Planning Assistance program that "works with states to help them take practical steps toward achieving full compliance with the model energy codes." The Compliance Planning Assistance program is divided into two phases:

- Phase one helps states conduct a gap analysis report, which documents a state's existing energy code infrastructure to assess the current gaps, identify best practices, and offer initial recommendations for improvement.
- In phase two, BCAP works with states to develop a strategic compliance plan, a targeted, state-specific plan with practical near- and long-term action items to move a state toward full energy code compliance.

Along with the Compliance Planning Assistance program, BCAP has also been working with the National Association of State Energy Officials (NASEO) and the Northwest Energy Efficiency Alliance (NEEA) to promote Energy Codes Compliance Collaboratives. The collaboratives are made up of groups of stakeholders exploring the adoption of and compliance with energy codes. The idea of establishing state collaboratives came out of Idaho, which was the first state to create a compliance collaborative in 2001. The success of the group, its structure and its practices were communicated to BCAP in 2009 by the Northwest Energy Efficiency Alliance. BCAP based its efforts on the Idaho model and supplemented it with its own work in the CPA program, where BCAP worked with 18 states to research and document gaps and best practices for building energy codes. The research found that establishing a collaborative was pivotal in several states not only to the success of state adoption of building codes, but also to supporting education and training, developing key messaging, advocacy, and other related activities. Ultimately, the purpose of a collaborative is to formulate a stakeholder group that is "willing to participate toward a common goal of energy code compliance for the purpose of achieving ultimate energy code value."

Other measures that states can take to support code compliance include the following:

- Conducting a study to determine actual rates of energy code compliance, which should also focus on determining compliance patterns, creating protocols for measuring compliance, and developing best practice training programs, being sure to update the study every several years
- Establishing a system through which utilities are encouraged to support code compliance (discussed below in greater detail)

- Providing and supporting training programs and outreach for code compliance in order to increase the number and effectiveness of contractors and code officials that monitor and evaluate compliance

Nearly every state in the country incorporates at least one of these methods for boosting compliance; a handful of states utilize approaches that incorporate most or all of these methods. Now that enough momentum and education has been built to encourage states to at least adopt the ARRA codes, in the future increasing efforts will need to be dedicated to ensuring compliance with new codes. Our scoring methodology changes reflect this need for a more specific focus on compliance, which we discuss below.

Utility Involvement in Building Codes

In several states that have passed EERS, programs have been established that allow utilities to claim savings for code enhancement activities, both for adoption and for compliance. Utilities are in a unique position to assist with state compliance goals, as they offer energy efficiency programs that target building energy efficiency and also collect important data on building energy consumption through customers' bills. Many utilities across the country offer energy efficiency programs that target improving energy efficiency in new construction specifically; therefore, combining code compliance efforts with efforts to improve energy efficiency beyond code requirements is something that, ideally, would happen concomitantly.

There are a number of ways that utilities can augment compliance with state and local building codes. Utilities can fund and/or administer training and certification programs, assist local jurisdictions with the implementation of tools that streamline enforcement, provide funding for the purchase of diagnostic equipment, and assist with compliance evaluation. Prudent regulatory mechanisms must be in place, such as program cost recovery or shared savings policies, to compensate utilities for their efforts in order to encourage them to participate. It is not enough to allow utilities to take credit for savings generated through their participation, as any program costs incurred directly reduce utility earnings.

METHODOLOGY & RESULTS

Our scoring methodology has changed noticeably from last year to reflect trends in building energy code policies. In light of the growing number of states that have adopted or will be adopting building energy codes that are at least equivalent to the ARRA codes, states must begin making a more concerted effort at ensuring compliance with their codes. Adopting stringent codes is an important first step, but energy savings will not be realized unless buildings are actually being constructed to meet code requirements.

States earn scores on two measures of building energy codes: the level of stringency of residential and commercial codes and the level of efforts to enforce compliance of codes. States can earn a maximum of 5 points for stringency and 2 points for compliance. Though the allocation of points for stringency and compliance is the same as in past years, we have shifted the stringency scoring slightly to award more points for states that are in compliance with the latest iteration of the codes, as opposed to compliance with the ARRA codes. We have also added new metrics to the compliance scoring in order to better capture the various facets that lead to high, verifiable rates of compliance.

Scoring on Code Stringency

Our review of state building energy code stringency is based predominantly on publicly available information such as that provided by the Online Code Environment and Advocacy Network (OCEAN), which maintains maps and state overviews of building energy codes, as well as the DOE's Building Energy Codes Program. Very recent code adoptions may not be captured by OCEAN, so we also rely on surveys sent to various state contacts to acquire the latest code developments. We assigned each state a score of 0 to 2.5 for residential and commercial building energy codes, with 2.5 being assigned to the most stringent codes (see Table 24), for a total of five possible points for building code stringency. For detailed information on building code stringency in each state, visit ACEEE's State Energy Efficiency Policy Database: http://www.aceee.org/sector/state-policy or see Appendix E.

Several states are still in the process of updating their building energy codes, so we awarded full credit (commensurate with the degree of code stringency as noted in Table 24) to those states that have exhibited progress and show a clear path leading toward the adoption and implementation of codes within the next year, or September 1, 2014. In other words, we have not limited qualification to codes that have already become effective. There are also states that have begun the process of updating their codes but have not yet officially adopted them nor have they demonstrated a clear path toward their adoption with a definitive effective date for implementation. Nonetheless, it is important to note that the processes in these states have begun and are moving along. In Table 26, we denote those states with a clear path toward adoption and implementation with an asterisk and award them full credit. Those states that have begun the adoption process but implementation has either stalled or the effective date is uncertain are denoted with a "+" and are awarded credit only for the code versions that are currently effective. Once their efforts have culminated in a clear path toward adoption and implementation of the new codes, the changes will be reflected in future editions of our Scorecard and those states will be awarded full credit.

We also award credit for states without statewide mandatory building energy codes for various levels of adoptions by major jurisdictions. Many "home rule" states, such as Arizona, Colorado, Kansas, Missouri, and Oklahoma, do not have mandatory statewide codes and, instead, adopt and enforce building energy codes at the local level. In these states, some of the local jurisdictions are major urban areas that have adopted the ARRA and 2012 codes and should be given credit for their efforts. We have not developed a quantitative method for determining the overall impact of jurisdictional code adoptions relative to statewide energy consumption or some other normalizing metric, but we have flagged this for incorporation into the next iteration of our Scorecard.

Table 24. Scoring Methodology for State Residential and Commercial Building Energy Codes: Stringency

Residential Building Code	Commercial Building Code	Score
Exceeds 2012 IECC or equivalent	Exceeds 2012 IECC or ASHRAE 90.1-2010 or equivalent	2.5
Meets 2012 IECC or equivalent	Meets 2012 IECC or ASHRAE 90.1-2010 or equivalent	2
Meets or exceeds 2009 IECC or equivalent	Meets or exceeds 2009 IECC or equivalent or ASHRAE 90.1-2007	1.5
Meets or exceeds 1998-2006 MEC/IECC (meets EPCA[33]) or equivalent, or significant adoption in major jurisdictions	Meets or exceeds 1998-2006 MEC/IECC or ASHRAE 90.1-1999/2001—ASHRAE 90.1-2004 or equivalent, or significant adoptions in major jurisdictions	1
No mandatory state energy code, but some adoption in major jurisdictions	No mandatory state energy code, but some adoption in major jurisdictions	0.5
No mandatory state energy code or precedes 1998 MEC/IECC (does not meet EPAct of 1992	No mandatory state energy code or precedes ASHRAE 90.1-1999 or equivalent (does not meet EPAct of 1992)	0

Note: Full credit is awarded to states that have adopted the 2012 versions of the IECC and ASHRAE 90.1 as well as those states that are on a clear path toward their adoption within the twelve months following September 1, 2013.

Scoring on Code Compliance

In addition, we also scored states' efforts to enforce compliance with state building codes. Scoring states on compliance is difficult due to the lack of data on actual compliance rates and the fact that other efforts taken to enforce compliance are largely qualitative. It is difficult to determine, for example, the change in compliance rates that is catalyzed by improvements to training programs, but it is generally agreed that training is critical to compliance efforts. The metrics we use to measure compliance are therefore limited to whether or not a state actively engaged in the areas we described above, which are also laid out in Table 25. Due to limited data in most states, we have made no attempt to score states based on actual compliance rates nor did we attempt to qualify the efficacy of compliance efforts. We have flagged these as methodological improvements for the next iteration of the *State Scorecard*.

In order to collect information on code compliance and enforcement activities, we distributed a survey to energy offices and other knowledgeable officials in each state requesting information regarding their efforts to measure and enforce code compliance. We have grouped the metrics as either policy- or performance-focused: a policy metric was one that develops a foundation for achieving high rates of compliance, and a performance metric was one that builds upon this foundation and directly impacts the level of compliance achieved.

[33] Under the federal Energy Policy and Conservation Act, states are required to review and adopt the MEC/IECC and the most recent version of ASHRAE Standard 90.1 for which DOE has made a positive determination for energy savings (currently 90.1-2010) or submit to the Secretary of Energy its reason for not doing so.

Table 25 below shows six compliance metrics and the scoring methodology for measure state compliance efforts. Two (2) points are possible, based on the number of compliance efforts undertaken by the state. Two (2) points are allocated for those states meeting all six of the criteria, with partial credit awarded for states undertaking fewer qualifying actions.

For more information on state compliance efforts, visit ACEEE's State Energy Efficiency Policy Database: http://www.aceee.org/sector/state-policy or see Appendix F.

Table 25. Scoring Methodology for State Compliance Efforts

Metrics for State Compliance Efforts		Number of Compliance Metrics Achieved	Score (2 pts.)
Policy	Assessments / Gap Analysis / Strategic Compliance Plan	6	2
	Baseline Compliance Study Completed	4-5	1.5
Performance	Stakeholder Advisory Group / Compliance Collaborative	2-3	1
	Updated Baseline Compliance Study in Last Two (2) Years	1	0.5
	Training and Outreach	0	0
	Utility Involvement		

Table 26 presents state scores for building energy code stringency and compliance efforts.

Table 26. Scoring for State Building Energy Codes: Stringency & Compliance

State	Residential Code Stringency (2.5 pts.)	Commercial Code Stringency (2.5 pts.)	Compliance (2 pts.)	Score (7 pts.)
California*	2.5	2.5	2	7
Washington	2.5	2	1.5	6
Rhode Island	2	2	2	6
New York*	2	2	1.5	5.5
Massachusetts*	2	2	1.5	5.5
Maryland	2	2	1.5	5.5
Illinois	2	2	1.5	5.5
Oregon	1.5	2.5	1.5	5.5
Iowa*	2	2	1.5	5.5
Vermont*	2	2	1.5	5.5
Connecticut*	2	2	1.5	5.5
Nebraska	1.5	1.5	2	5
Florida+	1.5	1.5	1.5	4.5
Nevada	1.5	1.5	1.5	4.5
New Hampshire	1.5	1.5	1.5	4.5
Idaho+	1.5	1.5	1.5	4.5
Delaware+	1.5	1.5	1.5	4.5
Colorado	1.5	1.5	1.5	4.5
Utah*	1.5	2	1	4.5
Alabama	1.5	1.5	1	4

State	Residential Code Stringency (2.5 pts.)	Commercial Code Stringency (2.5 pts.)	Compliance (2 pts.)	Score (7 pts.)
Montana	1.5	1.5	1	4
Virginia+	1.5	1.5	1	4
West Virginia*	1.5	1.5	1	4
Georgia	1.5	1.5	1	4
Michigan+	1.5	1.5	1	4
New Mexico	1.5	1.5	1	4
North Carolina*	1.5	2	0.5	4
Pennsylvania	1.5	1.5	1	4
South Carolina	1.5	1.5	1	4
Hawaii	1.5	1.5	1	4
Kansas	1.5	1	1.5	4
Oklahoma	1.5	1.5	1	4
Ohio	1.5	1.5	1	4
Texas+	1.5	1.5	1	4
New Jersey	1.5	1.5	1	4
Arkansas+	1	1.5	1	3.5
Indiana	1.5	1.5	0.5	3.5
Kentucky	1.5	1.5	0.5	3.5
Louisiana*	1.5	1.5	0.5	3.5
District of Columbia+	1.5	1.5	0.5	3.5
Wisconsin	1	1.5	1	3.5
Arizona	1.5	1	1	3.5
Mississippi	0	2	1	3
Missouri	1	1	1	3
Minnesota+	1	1	1	3
Maine	1	1	0.5	2.5
Tennessee	1	1	0.5	2.5
Wyoming	0.5	0.5	1	2
Alaska+	0.5	0	1	1.5
North Dakota	0.5	0.5	0.5	1.5
South Dakota	0.5	0.5	0	1

Sources: Stringency scores derived from BCAP (2013) as of September 2013. Compliance and enforcement scores based on information gathered through surveys of state building energy code contacts. See ACEEE's State Energy Efficiency Policy Database for more information on state codes and compliance: http://www.aceee.org/sector/state-policy.

* These states have signed or passed legislation mandating compliance with a new iteration of codes, effective within the next year, or their rulemaking processes are far enough along that mandatory compliance is imminent. These states are awarded full credit commensurate with the degree of code stringency as noted in Table 24.

+ These states have signed or passed legislation mandating compliance with a new iteration of codes, but have not demonstrated a clear path forward toward their adoption, so that the effective date remains uncertain. States that are scheduled to adopt codes after September 1, 2014 are also included here. These states are not awarded full credit commensurate with the degree of code stringency of that next iteration, as noted in Table 24.

In our *2013 State Scorecard*, an additional 13 states have adopted—or will adopt over the next year—the latest iteration of the IECC and ASHRAE energy codes for either residential or commercial new construction relative to the *2012 State Scorecard*, where Illinois and

Maryland were the first to adopt these codes. Still, no state was awarded the maximum score of 7 points, though several achieved scores of 6 points or more due to a combination of stringent energy codes and laudable compliance efforts.

There are 9 states that do not have mandatory statewide energy codes for either residential or commercial new construction, or both: Alaska, Arizona, Colorado, Kansas, Mississippi, Missouri, North and South Dakota, and Wyoming. Some of these "home rule" states are nonetheless showing high rates of adoption at the jurisdictional level, including Arizona, Colorado, Kansas, and Missouri. These states are awarded points accordingly. States that received zero points for compliance efforts are those that did not respond to our survey.

Chapter 5: Combined Heat and Power

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INTRODUCTION

Combined heat and power systems generate electricity and thermal energy in a single, integrated system. These systems are most often located in industrial settings, but there are commercial and residential applications for CHP as well. There are many possible fuels for CHP systems, including coal, natural gas, biofuels, and waste heat from industrial processes. CHP is more energy efficient than separate generation of electricity and thermal energy because heat that is normally wasted in conventional power generation is recovered as useful energy. That recovered energy is used to satisfy an existing thermal demand, such as the heating and cooling of a building or water supply. CHP systems can save customers money and reduce overall net emissions. CHP can also help provide additional stability to the electric grid and increased reliability of the electric supply for the facility operating the CHP system. This last benefit can be particularly important during extreme weather events or other electrical disruptions, because CHP systems can allow hospitals or other essential services to maintain operations.

There are several key concerns for potential CHP developers when considering whether or not to install a system. One is price—the upfront cost of a CHP system can be enormous, and the payback period can be longer than many companies are comfortable with. This can be addressed directly with various grants, incentives, or favorable financing options. Another concern may be the logistics of connecting a CHP facility to the grid. It would be unusual for a CHP installation to meet exactly 100% of a facility's needs all of the time. In order to purchase additional power or sell excess power, the CHP installation must be connected to the grid. This requires the CHP developer to make a series of agreements with the local utility. Net metering and interconnection regulations govern these agreements. Finally, state regulations on utility fuel portfolios and Clean Air Act implementation plans can have an important impact on CHP. States with strong regulations requiring utilities to obtain a certain amount of energy from efficiency or alternative sources are particularly favorable to CHP.

In this chapter of the *State Scorecard,* A state could earn up to five (5) points based upon its adoption of regulations and policies that encourage the deployment of CHP systems. There are multiple ways in which states can actively encourage or discourage the deployment of CHP. Financial, technical, policy, and regulatory factors all impact the extent to which CHP is deployed.

The seven factors considered in scoring CHP for the *2013 State Scorecard* were:

- Standard interconnection rules
- The eligibility of CHP/waste heat recovery in a state's RPS, EERS, or other standard
- Applicable financial incentive programs
- Favorable net metering regulations
- Output-based emissions regulations

- Loan and loan guarantee programs
- Additional supportive policies, such as technical assistance programs

We also include, but do not score, an assessment of two additional factors in the *2013 State Energy Efficiency Scorecard*:

- The number of CHP installations in each state, and the total CHP capacity installed in each state[34]
- State retail industrial electricity and natural gas prices

We do not include the number of CHP installations in each state because the economic feasibility of a CHP project is strongly impacted by the local retail electricity and gas rates, which states cannot control. When electricity prices are high compared to natural gas rates, it can be less expensive for a facility to generate electricity on-site via CHP than to purchase electricity from the grid. State policies can make CHP more attractive by reducing administrative barriers, assisting with the large upfront investment of installing a CHP system, or using incentives or credits to make electricity generated on-site more valuable to a facility than electricity purchased from the grid. However, even with ideal policies in place, there will be more CHP installations in a state with high electricity prices and low natural gas prices than in a state with high natural gas prices and low electricity prices due to sheer economics. Since we do not want to reward or penalize states for factors outside their control, we do not count the number of CHP installations in the final score.

Interconnection Standard

Interconnection standards define how a CHP system (or any other kind of distributed generation, like photovoltaic arrays or wind turbines) can physically connect to the grid. For interconnection to take place, the owner of the CHP system must make an agreement with the local utility to comply with certain technical and safety guidelines. A statewide interconnection standard means that there is a standard procedure for CHP interconnection agreements, rather than having to develop them on a case-by-case basis. Interconnection standards that support CHP are uniform and transparent and do not allow room for arbitrary delays. CHP deployment is encouraged when multiple levels (or tiers) of interconnection standards exist, which allow smaller, less-complex systems to follow a simplified application process. Smaller systems can be offered a faster, and often cheaper, path toward interconnection. Scaling these transaction costs to project size makes economic sense, because customers with larger projects—and thus larger potential economic gains—often have more incentive to spend time and money to interconnect their more complex systems than do customers with smaller projects facing smaller economic returns. Additionally, interconnection standards that have higher size limits are preferred by CHP

[34] Estimates for the number of new CHP installations in each state come from ICF International's CHP database (available at http://www.eea-inc.com/chpdata/). As of June 2013, data collection for 2012 is incomplete, so there may be some additional CHP installations in 2012 that are not included in the final count.

developers, as are standards that are based upon widely accepted technical industry standards, such as the IEEE 1547 standard.[35]

Treatment of CHP Under an EERS/RPS

Renewable portfolio standards (RPS) and energy efficiency resource standards (EERS) define a particular amount of a state's electricity resources that must be derived from renewable energy or energy efficiency. Most states with RPS or EERS policies set goals for future years, generally a percentage of total electricity sold that must be derived from renewable or efficiency resources, with the percentage increasing over time. Not only are utilities required to meet the policy goals, but these standards are often paired with financial incentives or support programs that encourage specific technologies. When CHP is explicitly listed as eligible for RPS or EERS credit, this creates a large incentive to deploy CHP systems.

Incentives for CHP

Incentives can include per-kW or per-kWh production incentives, in which the developer receives a small amount of money for each kW installed or kWh produced, or project-based grants from the state to the CHP developer. They can also include tax incentives, which are generally more permanent than grant programs. Tax incentives for CHP take many forms, but are often credits taken against business or real estate taxes. Rebates, grants, and deductions are all ways in which CHP can be encouraged at the state level, and the leading states have mixtures of multiple types of incentives.

Net Metering

Net metering is commonly applied to renewable energy systems, but it is also applicable to CHP systems. Sound net metering regulations allow the owners of small distributed generation systems to get credit for excess electricity that they produce on site. Under net metering rules, owners of distributed generation systems are compensated for some or all excess generation either at the utility's avoided cost or (less often) at higher retail rates. Less optimal situations constitute barriers to the deployment of CHP and other distributed generation systems, such as the levying of fees on net-metered systems or rules that set overly strict limits on individual system size and aggregate capacity. Limits on individual and aggregate system capacities can prevent system owners from installing the most efficient or cost-effective systems, and sometimes even prevent them from meeting onsite load requirements. Any size limits should be based only on objective engineering standards and facility load requirements. Other best practices for net metering include eligibility for all distributed generation technologies, including CHP; eligibility for all customer classes; system size limits that go up to 2 MW; indefinite net excess generation carryover at the utility's retail rate; and prohibition of special fees for net metering.

[35] This standard establishes criteria and requirements for interconnection of distributed energy resources with electric power systems. It provides requirements relevant to the performance, operation, testing, safety considerations, and maintenance of the interconnection. For more information, visit http://www.ieee.org/portal/site.

Emissions Treatment

Output-based emissions regulations are air quality regulations that take the useful energy output of CHP systems into consideration when quantifying a system's criteria pollutant and carbon dioxide emissions. Many states issue air permits to generators with pollutant limits based upon the systems' volume of fuel input. For CHP systems, electricity and useful thermal outputs are generated from a single fuel input. Therefore, calculating emissions based solely on input ignores the additional power created by the system, using little or no additional fuel. Output-based emissions regulations, in contrast, acknowledge that the additional useful energy output was generated in a manner generally cleaner than the separate generation of electricity and thermal energy. Additional information for policies in this category is also available from the Environmental Protection Agency via its CHP Partnership website (EPA 2013).

Financing Assistance

Appropriate financing opportunities can be a major barrier to development of CHP systems. Low-interest-loan programs, loan guarantees, and bonding authorities are all strategies states can use to make CHP systems financially attractive.

Other Supportive Policies

Other supportive policies include technical assistance programs, education campaigns, and other unique policies or incentives that support CHP. Detailed descriptions of these policies in applicable states are noted in the "Clean Distributed Generation" section of the ACEEE State Policy Website (ACEEE 2013).

METHODOLOGY & RESULTS

Last year, we introduced a newly redesigned methodology for CHP scores, which we continued continuing rely on this year. For an in-depth discussion our methodology, see the ACEEE white paper *CHP Methodology in the 2012 Scorecard* (Chittum 2012).

The maximum score available across all categories in this policy area was five (5) points. For all categories, states received more points if the applicable policy or regulation pertained to all forms of CHP, including that powered by fossil fuels such as natural gas. Policies were also scored more highly when they applied to CHP in all sectors, rather than just a single sector, such as residential.

Some states have recently adopted new and improved policies or regulations, while some are still in the process of developing or improving them. Generally, credit was not given for a policy unless it was in place—enacted by a legislative body or promulgated as an order from an agency or regulatory body. Some states that formerly had policies in place have since removed or in other ways nullified these policies; in these situations, we did not give credit for the policy in question. Policies in place as of July 2013 were considered for this review, though programs that are no longer accepting applications, such as ARRA-funded financing programs, were not considered.

Scoring on Interconnection Standards

States could receive up to one (1) point for the presence of an interconnection standard that explicitly established parameters and procedures for the interconnection of CHP systems. We relied upon secondary sources—such as the Database for State Incentives for Renewable Energy (DSIRE 2013) and the Environmental Protection Agency's CHP Partnership database (EPA 2013) —as well as primary sources such as public utility commission dockets and interviews with commission staff and utility representatives. To receive a top score, interconnection standards needed to:

- Cover all forms of CHP, regardless of fuel
- Have multiple "tiers" of interconnection or some kind of fast track for smaller systems
- Apply to systems larger than 10 MW.

States that had interconnection standards that apply to systems up to 10 MW but otherwise met the above criteria were awarded one-half (0.5) point.

Scoring on CHP Inclusion in Energy Standards

We also award up to one (1) point for eligibility of CHP for credit in an RPS, EERS, or other energy standard. RPS and EERS policies define a particular amount of a state's electric resources that must be derived from renewable energy or energy efficiency resources. To receive full credit, state EERS or RPS must:

- Apply to all CHP installations, regardless of fuel;
- Treat CHP as a resource in the top tier or category
- Be binding, including penalties for utilities that do not meet goals

States with RPS or EERS policies that include natural gas–powered CHP, but are not binding or include CHP in a lower resource tier were awarded one-half (0.5) point.

Scoring on Incentives for CHP

States could also receive up to one point for incentives for CHP. Incentives can include per-kW or per-kWh production incentives, project-based grants, or tax incentives, which are generally more enduring than grant programs. Tax incentives for CHP take many forms, but are often credits taken against business or real estate taxes. The leading states use multiple types of incentives. For the state to receive the full point, at least one available incentive needed to meet all of the following criteria:

- Apply to all CHP installations, regardless of fuel;
- Be a production credit, investment credit, credit for systems size, or a grant
- Be used in the commercial *and* industrial sectors.

Incentives that are tax exemptions or credits against property taxes, or only apply to biomass or renewable-powered CHP systems, are eligible for one-half (0.5) point. Additional information on incentives for CHP is available from EPA through its CHP Partnership (EPA 2013) and from the Database for State Incentives for Renewable Energy (DSIRE 2013).

Scoring on Net Metering

We award up to one-half (0.5) point for the presence of net metering regulations that apply to CHP. Net metering is most commonly applied to renewable energy systems, but can also be applicable to small combined heat and power systems, often those under 1 or 2 MW. Sound net metering regulations allow owners of small distributed generation systems to get credit for excess electricity that they produce on-site. Under net metering rules, distributed generation system owners are compensated for some or all excess generation either at the utility's avoided cost, or, less often, at higher retail rates. To receive credit, states must have net metering rules that:

- Can be used by all customer classes,
- Apply to all CHP installations, regardless of fuel,
- Apply to systems up to at least 2 MW, and
- Do not limit overall aggregate capacity within the system.

A barrier to the deployment of CHP systems arises when fees are levied on net-metered systems and when overly strict limits are set on individual system and aggregate capacity size. Limits on individual and aggregate system capacities can prevent system owners from installing the most efficient or cost-effective systems, and sometimes even prevent them from meeting onsite load requirements. Any size limits should be based only on objective engineering standards and facilities' load requirements. Other best practices for net metering include indefinite net excess generation carryover at the utility's retail rate and prohibition of special fees for net metering.

Scoring on Emissions Regulations

We also award one-half (0.5) point for the presence of output-based emissions regulations. These are air quality regulations that take the useful energy output of CHP systems into consideration when quantifying a system's criteria pollutant emissions. Many states employ emissions regulations for generators by calculating levels of pollutants based upon the fuel input into a system. For CHP systems, electricity and useful thermal outputs are generated from a single fuel input. Therefore, calculating emissions based solely on input ignores the additional power created by the system, using little or no additional fuel. To receive full credit, states must have had:

- A fast-track CHP permit in place for criteria air pollutants, such as sulfur oxides (SO_x) and nitrogen oxides (NO_x)
- Output-based parameters for all applicable pollutants and permits

Additional information for policies in this category is also available from EPA via its CHP Partnership Web site (EPA 2013).

Scoring on Financing Assistance

States can receive up to one-half (0.5) point for the level of financing assistance available for CHP systems. Appropriate financing opportunities can be a major barrier to development of CHP systems. Low-interest loan programs, loan guarantees, and bonding authorities are all strategies states can use to make CHP systems financially attractive. To receive credit, key

programs must be available to all forms of CHP and be substantial enough to be able to truly be used by industrial facilities.

Scoring on Supportive Policies

We also award one-half (0.5) point for other supportive policies. Such policies can include technical assistance programs, education campaigns, or other unique policies or incentives that support CHP. Detailed descriptions of these policies in applicable states are noted in the "Clean Distributed Generation" section of the ACEEE State Policy Website.

States were awarded up to five (5) points for their efforts to encourage CHP through regulatory and financial mechanisms. Table 27 lists each state's total and its point distribution for each metric.

Additional Metrics

Two additional sets of factors were noted but did not factor into states' scores.

First, we included data on the number of individual CHP systems as well as the total CHP capacity installed in each state in the past two years. CHP systems take a long time to plan and install; therefore, a single year may not best reflect the CHP activity of each state. Though this information is not, in its own right, a full indicator of a state's CHP friendliness, as economic factors well beyond the state's control may strongly impact the degree to which CHP projects are installed, this information is nonetheless useful for making comparisons among states. Future *State Scorecards* may score states on their installed CHP as compared to some measure of technical or economic potential.

Finally, the retail electricity and natural gas rates paid by facilities in a given state can have significant impacts on the overall economics of a CHP system. States did not earn points for this. This reflects one aspect of economic attractiveness to CHP developers. Higher electricity prices may make the economic case for CHP easier in some states, while lower and stable natural gas prices may help hasten investment in CHP in others. The fact that these prices do not enter into each state's actual ranking recognizes that a state cannot directly control the retail price of electricity or gas to its customers. However, the price of electricity and gas directly influences a state's CHP market, and policymakers need to take this into consideration and implement policies that help overcome economic barriers presented in part by lower electricity prices or higher gas prices. The retail price of both electricity and natural gas is shown below for the industrial sector, reflecting the fact that this is where the largest opportunity for CHP exists.

Table 27. State Scoring for CHP

State	Inter-connection (1 pt.)	RPS/EERS Treatment (1 pt.)	Net Metering (0.5 pt.)	Incentives (1 pt.)	Emissions (0.5 pt.)	Financing (0.5 pt.)	Additional Policies (0.5 pt.)	Score (5 pts.)
Massachusetts	1	1	0	1	0.5	0.5	0.5	4.5
Connecticut	1	0.5	0.5	0.5	0.5	0.5	0.5	4
Ohio	1	1	0	0.5	0.5	0.5	0	3.5
Oregon	1	0	0	1	0.5	0.5	0.5	3.5
California	1	0	0	1	0.5	0	0.5	3
Arizona	0.5	1	0.5	0.5	0	0	0	2.5
New Jersey	0	0	0	1	0.5	0.5	0.5	2.5
New York	0	0.5	0	1	0.5	0	0.5	2.5
Washington	1	0.5	0	0.5	0.5	0	0	2.5
Illinois	1	0.5	0	0	0.5	0	0	2
Maine	1	0.5	0	0	0.5	0	0	2
Maryland	0.5	0.5	0	0.5	0	0	0.5	2
Michigan	1	0.5	0	0.5	0	0	0	2
North Carolina	1	0.5	0	0.5	0	0	0	2
Rhode Island	0	0.5	0	0.5	0.5	0	0.5	2
Texas	0.5	0.5	0	0	0.5	0	0.5	2
Vermont	1	0.5	0	0.5	0	0	0	2
Wisconsin	1	0	0	0.5	0.5	0	0	2
Colorado	0.5	0.5	0	0	0	0.5	0	1.5
Delaware	0.5	0.5	0	0	0.5	0	0	1.5
Indiana	1	0	0	0	0.5	0	0	1.5
Iowa	0.5	0	0	0.5	0	0.5	0	1.5
New Hampshire	0	0	0	1	0.5	0	0	1.5
New Mexico	1	0	0	0.5	0	0	0	1.5
Pennsylvania	0	0.5	0.5	0.5	0	0	0	1.5
Utah	1	0	0	0.5	0	0	0	1.5
District of Columbia	0.5	0	0	0.5	0	0	0	1
Florida	0	0	0	1	0	0	0	1
Kansas	0	0	0	1	0	0	0	1
Minnesota	0.5	0.5	0	0	0	0	0	1
Nevada	0	0.5	0	0.5	0	0	0	1
South Dakota	0.5	0	0	0.5	0	0	0	1
Tennessee	0.5	0	0	0	0	0.5	0	1
West Virginia	0	0.5	0.5	0	0	0	0	1
Alabama	0	0	0	0	0	0.5	0	0.5
Alaska	0	0	0	0.5	0	0	0	0.5
Arkansas	0	0	0	0	0.5	0	0	0.5

State	Inter-connection (1 pt.)	RPS/EERS Treatment (1 pt.)	Net Metering (0.5 pt.)	Incentives (1 pt.)	Emissions (0.5 pt.)	Financing (0.5 pt.)	Additional Policies (0.5 pt.)	Score (5 pts.)
Georgia	0	0	0	0.5	0	0	0	0.5
Hawaii	0	0.5	0	0	0	0	0	0.5
Louisiana	0	0	0	0	0	0	0.5	0.5
Missouri	0	0	0	0	0.5	0	0	0.5
Montana	0	0	0	0.5	0	0	0	0.5
North Dakota	0	0	0	0.5	0	0	0	0.5
South Carolina	0	0	0	0.5	0	0	0	0.5
Virginia	0	0	0	0.5	0	0	0	0.5
Idaho	0	0	0	0	0	0	0	0
Kentucky	0	0	0	0	0	0	0	0
Mississippi	0	0	0	0	0	0	0	0
Nebraska	0	0	0	0	0	0	0	0
Oklahoma	0	0	0	0	0	0	0	0
Wyoming	0	0	0	0	0	0	0	0

Table 28 presents data on CHP systems and electricity and natural gas rates by state.

Table 28. Installed CHP Capacity and Fuel Prices by State, 2011-2012

State	Number of New CHP Installations in 2012	Total New Capacity Installed in 2012 (kW)	Number of New CHP Installations in 2011	Total New Capacity Installed in 2011 (kW)	2012 Industrial Electricity Prices (Cents/kWh)	2012 Industrial Gas Prices ($/Thousand Cubic ft.)
Alabama	0	0	3	19000	6.20	4.32
Alaska	2	2400	4	1050	16.75	3.56
Arizona	2	1000	0	0	6.53	5.83
Arkansas	0	0	0	0	5.65	6.36
California	12	19525	19	20850	10.73	5.77
Colorado	1	70000	0	0	6.94	5.76
Connecticut	4	1260	9	17225	12.76	9.16
Delaware	0	0	0	0	8.34	11.69
District of Columbia	0	0	0	0	5.43	-
Florida	1	5500	2	18800	8.04	8.07
Georgia	2	13000	1	1900	5.89	4.33
Hawaii	0	0	1	3200	30.77	30.89
Idaho	0	0	1	4500	5.55	5.74
Illinois	3	700	2	3617	5.91	6.84
Indiana	0	0	1	0	6.35	6.53
Iowa	0	0	0	0	5.33	4.71
Kansas	0	0	0	0	6.88	3.80
Kentucky	0	0	0	0	5.35	3.84
Louisiana	0	0	3	59500	4.75	2.96
Maine	1	630	3	1107	7.87	10.89
Maryland	0	0	2	4730	8.12	8.61
Massachusetts	2	1150	12	5284	12.91	10.14
Michigan	1	1000	1	1600	7.73	7.42
Minnesota	0	0	0	0	6.59	4.29
Mississippi	0	0	0	0	6.16	4.61
Missouri	1	5000	0	0	5.85	7.86
Montana	1	2500	0	0	5.04	8.13
Nebraska	0	0	0	0	6.81	4.43
Nevada	0	0	0	0	6.46	7.32
New Hampshire	0	0	0	0	11.82	10.48
New Jersey	6	35570	3	16800	10.54	9.23
New Mexico	0	0	0	0	5.83	4.88
New York	12	15055	28	46585	6.67	8.09
North Carolina	5	12400	3	1276	6.34	6.33
North Dakota	0	0	0	0	6.66	4.48
Ohio	2	710	3	47800	6.21	6.77

State	Number of New CHP Installations in 2012	Total New Capacity Installed in 2012 (kW)	Number of New CHP Installations in 2011	Total New Capacity Installed in 2011 (kW)	2012 Industrial Electricity Prices (Cents/kWh)	2012 Industrial Gas Prices ($/Thousand Cubic ft.)
Oklahoma	1	15000	0	0	5.03	7.37
Oregon	0	0	2	18805	5.61	6.84
Pennsylvania	11	18580	4	18200	7.24	9.86
Rhode Island	0	0	0	0	10.86	10.98
South Carolina	0	0	2	70000	5.96	4.27
South Dakota	0	0	0	0	6.57	4.87
Tennessee	0	0	0	0	7.12	4.84
Texas	0	0	4	209366	5.73	3.02
Utah	0	0	0	0	5.62	4.70
Vermont	1	250	0	0	9.96	4.89
Virginia	0	0	2	580	6.72	4.92
Washington	2	1750	3	17865	4.11	8.70
West Virginia	0	0	0	0	6.33	4.61
Wisconsin	2	2237	3	3158	7.41	5.80
Wyoming	0	0	0	0	6.03	4.07
Average	**1.5**	**4416**	**2.4**	**12016**	**7.69**	**8.66**

Sources: ICF 2013, EIA 2013c

This year's rankings did not change substantially compared to last year's rankings, reflecting a relatively quiet year in terms of notable CHP policy developments. As with last year, no state received the full five (5) points. Massachusetts obtained the top score of four and one-half (4.5) points, missing only one-half (0.5) point for net metering standards. The state's Alternative Energy Portfolio Standard remains the best example of how to prioritize CHP within a portfolio standard. Connecticut also scored highly, scoring four (4) points for its policies to encourage the development of CHP within the state. Massachusetts and Connecticut are followed by Oregon and Ohio, each with 3.5 points. Unfortunately, several states allowed their policies favorable to CHP to expire, resulting in a lower average score across all states compared to last year.

Several states did implement new supportive policies pertaining to CHP, further enhancing their attractiveness to CHP developers. These states can be viewed as leading examples of CHP-friendly policy deployment. Figure 5 describes notable policies currently in place.

Figure 5. Leading State Policies: Combined Heat & Power

Texas: In May 2013 Texas House Bill 2049 became law. The bill amends the state Utilities Code to allow owners of CHP units to sell excess electric power at retail prices to more than one purchaser of the CHP unit's thermal output. It also states that owners of CHP units who do this are not subject to regulation as a retail electric utility. This new law should make it simpler for CHP operators to sell excess power, and make investment in CHP more attractive.

New Jersey: In October 2012, Hurricane Sandy struck the Northeastern US. New Jersey was hit particularly hard by the storm, and began to look at CHP as a way to protect against future extreme weather events. In December 2012, the New Jersey Office of Clean Energy hosted a stakeholders meeting with utility officials, energy suppliers, and others with an interest in CHP. The group proposed prioritizing facilities such as hospitals, prisons, and wastewater treatment plants that would be most in need of power in the event of another Sandy-like scenario.

Oregon: In 2013, Oregon signed into law State Bill 844, which allows natural gas distribution utilities to invest in energy efficiency projects and programs that yield overall emissions reductions. Importantly, these programs can include projects like CHP, because the language recognizes that sometimes increased natural gas consumption at a particular point may yield reduced natural gas consumption at the point of centralized electricity generation. The costs for these projects can be recovered from the ratepayers that benefit from emission reductions.

Chapter 6: State Government-Led Initiatives

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INTRODUCTION

State legislatures and governors can advance policies and programs that impact many of the sectors discussed in previous chapters, including utility-sector energy efficiency, transportation efficiency, building codes, and CHP. This chapter, however, is dedicated to the energy efficiency initiatives that are designed, funded, and implemented by a broad array of state-level administrators such as state energy offices, universities, and economic development and general services agencies. We focus on four initiatives commonly undertaken by state governments: financial incentive programs for consumers, businesses, and industry; policies that require commercial and residential buildings to disclose energy usage data; lead-by-example policies and programs put in place by states to improve the energy efficiency of their facilities and fleets; and research, development, and demonstration activities for energy efficiency technologies and practices.

The American Recovery and Reinvestment Act of 2009 (ARRA) channeled nearly $80 billion through the Department of Energy (DOE) for clean energy projects, a large portion of which was passed through to states for energy efficiency projects (DOE 2013c). This wave of funding laid the groundwork for the expansion of energy efficiency programs in states across the country. Many states continue to leverage ARRA funds and implement programs that will carry on even after federal support diminishes. It is critical to recognize state government–led initiatives, which play a unique role in fostering an energy-efficient economy. State government-led initiatives complement the existing landscape of utility programs, leveraging resources from the state's public and private sectors to generate energy and cost savings that benefit consumers (Sciortino & Eldridge 2010).

Financial Incentives

Financial incentives are an important instrument to spur the adoption of technologies and practices in homes and businesses. They can take many forms: rebates, loans, grants, or bonds for energy efficiency improvements; income tax credits and income tax deductions for individuals or businesses; and sales tax exemptions or reductions for eligible products. Financial incentives can lower the upfront cost and shorten the payback period of energy efficiency upgrades, two critical barriers to consumers' and businesses' making cost-effective efficiency investments. Incentives also raise consumer awareness of eligible products, encouraging manufacturers and retailers to market these products more actively and to continue to innovate. As economies of scale improve, prices of energy-efficient products fall, and the products eventually compete well in the market without the incentives.

Disclosure of Buildings' Energy Use

Building energy disclosure laws improve consumers' awareness of the energy use of homes and commercial buildings being offered for sale or lease, which can have a significant impact on the economic value of a home or building. A requirement to disclose a building's

energy use also provides building owners with the information necessary to consider improving the energy efficiency of their buildings.

Energy-use disclosure requirements are a fairly recent policy innovation. New York's Truth in Heating Law, enacted in 1980, led the way for residential disclosure laws, which states began to adopt in the mid-2000s. Commercial disclosure policies are less common, with only California, Washington, and the District of Columbia requiring energy-use disclosure upon sale or lease (IMT 2013). These policies tend to be pursued more aggressively by local governments, but are an effective way for state governments to incentivize building stock upgrades.

Lead by Example

State governments can advance energy-efficient technologies and practices in the marketplace by adopting policies and programs to save energy in public sector buildings and fleets, a practice commonly referred to as "lead by example." In the current environment of fiscal austerity, lead-by-example policies and programs are a proven strategy to improve the operational efficiency and economic performance of states' assets. Furthermore, lead-by-example initiatives reduce negative environmental and health impacts of high energy use and promote energy efficiency to the broader public.

States commonly adopt policies and comprehensive programs that aim to reduce energy use in state buildings. State governments operate numerous facilities, including office buildings, public schools, colleges, and universities, the energy costs of which can account for as much as 10% of a typical government's annual operating budget (EPA 2009). Only a handful of states have not yet implemented a significant energy efficiency policy for public facilities. The most widely adopted measure at the state level is a mandatory energy savings target for new and existing state government facilities. These energy savings requirements encourage states to invest in the construction of new, efficient buildings and retrofit projects, lowering energy bills and promoting economic development in the energy services and construction sectors.

Two critical elements of successful energy efficiency initiatives in the public sector are proper building energy management and institutional support for energy savings performance contracts, such as housing state support for energy savings performance contracts (ESPCs) within a specific state agency that serves as the lead contact for implementing them. Both of these initiatives can help projects overcome information and cost barriers to implementation. . If the necessary encouragement, leadership, and resources are in place, states can finance energy improvements through ESPCs, which allow the state to enter into a performance-based agreement with an energy service company (ESCO). The contract allows the state to pay the company for its services with money saved by installing energy efficiency measures.[36]Adding a third type of initiative, benchmarking energy use in public-sector buildings through tailored or widely available tools such as the Environmental

[36] For a full discussion of ESPCs, the energy service company (ESCO) market, and actual implementation trends see (Satchwell et al. 2010) and the Energy Services Coalition website (http://www.energyservicescoalition.org/).

Protection Agency (EPA)'s ENERGY STAR Portfolio Manager, ensures a comprehensive set of energy-use data[37] that can drive cost-effective energy efficiency investments

In addition to lead-by-example initiatives in state government buildings, states have also put in place policies encouraging or requiring efficient vehicle fleets in order to reduce fleet fuel costs and hedge against rising fuel prices. Collectively, state governments own approximately 500,000 vehicles, with a median fleet size of about 3,500 vehicles. Operation and maintenance costs for these fleets every year run to more than $2.5 billion nation-wide, ranging from $7 million to $250 million per state (NCFSA 2007). In response to this significant cost, states have often adopted a definitive efficiency standard for state vehicle fleets—a tool that ensures a reduction in fuel consumption and greenhouse gas (GHG) emissions. Other policies include binding goals to reduce petroleum use by a certain amount over a given time frame, meaningful GHG reduction targets for fleets, and procurement requirements for hybrid-electric or all- electric vehicles. In order to receive credit in the *2013 State Energy Efficiency Scorecard*, fleet policies had to specify fuel economy improvements that exceeded existing corporate average fuel economy (CAFE) standards.

Research and Development (R&D)

Research and development (R&D) programs drive advances in energy-efficient technologies, and states play a unique role in laying the foundation for such progress. By leveraging resources in the public and private sectors, state governments can foster collaborative efforts that achieve the goals of rapidly creating, developing, and commercializing new, energy-efficient technologies. These programs can also encourage cooperation among organizations from different sectors and backgrounds to further spur innovation in energy-efficient technologies.

State R&D efforts, in addition to providing a variety of services to create, develop, and deploy new technologies for energy efficiency, can address a number of market failures that exist in the energy services marketplace that impede the diffusion of new technologies (Pye and Nadel 1997). In response to the increasing need for state initiatives in energy-related RD&D, several state institutions established the Association of State Energy Research and Technology Transfer Institutions (ASERTTI) in 1990. Members of ASERTTI collaborate on applied R&D and share technical and operational information with a strong focus on end-use efficiency and conservation.

Aside from those institutions affiliated with ASERTTI, numerous other state-level entities conduct research and development programs. A diverse set of institutions (including universities, state governments, research centers, and utilities) fund and implement RD&D programs for the purpose of advancing energy efficiency throughout the economy. Such programs include research on energy consumption patterns in local industries and development of energy-saving technologies at state or university research centers, and through public-private partnerships.

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[37] Some states have in place their own databases of public building energy use that integrate with EPA's Portfolio Manager. For example, Maryland's EnergyCAP database (http://www.dgs.maryland.gov/energy/EnergyDatabasePublic.html) compiles the energy use (based on utility bills) of all public buildings in the state and provides a means of comparing buildings owned by different state agencies. The database is available to the public and to all state agencies.

Individual state research institutions provide expertise and knowledge from which policymakers can draw in order to advance successful efficiency programs. These institutions provide the research and development needed to spur the commercial investment and manufacturing of new energy-efficient technologies. State research institutions enable valuable knowledge spillovers to other states through the sharing of information—facilitated through membership with ASERTTI—allowing states to benefit from one another's research. States without R&D institutions can use this shared information as a roadmap in order to begin or advance their own efficiency programs. Even leading states have the potential to improve or add to their R&D efforts by drawing from the programs and best practices of other states.

The American Recovery and Reinvestment Act and State Governments

The American Recovery and Reinvestment Act of 2009 (ARRA) included the largest single investment in energy efficiency in U.S. history. The law directed approximately $17 billion to improve the country's energy efficiency and, as seen in Table 29 below, a substantial share went to states from the Department of Energy's (DOE) Office of Energy Efficiency and Renewable Energy (DOE 2013c).[38] Additional programs that may indirectly provide money for state and local government programs include the Advanced Research Projects Agency-Energy (ARPA-E), which funds energy efficiency research projects at state universities. These programs have provided an important first step, particularly in states minimally served by utility efficiency programs, to introduce consumers and decision-makers to the benefits of energy efficiency programs.

Table 29. ARRA Energy Efficiency Funding to State and Local Governments

Program	FY 2008 Budget	Stimulus Funding
Weatherization Assistance Program	$227 million	$5 billion
State Energy Program	$33 million[39]	$3.1 billion
Energy Efficiency and Conservation Block Grant Program	N/A	$2.8 billion
Appliance Rebate Program	N/A	$300 million
Total	$260 million	$11.6 billion

Source: DOE (2013c). Note that funding levels have now returned to 2008 levels, although states continue to leverage unspent funds.

While ARRA's main intent was to stimulate rapid job growth, its effects on state-level energy efficiency programs have been significant and will last for years, if not decades. From the outset, state governments were encouraged to use ARRA funds to establish energy efficiency financing mechanisms that could leverage private sector capital and maximize the usefulness of the funds. Thirty-five established 66 revolving loan funds with approximately $925 million in ARRA money. The majority of these programs have transitioned to at least partial state funding (NASEO 2013). ARRA also cemented better connections among state energy offices, the DOE, and lending institutions, in particular community development

[38] An additional $15 billion was allocated to programs and projects in which funding could be used for energy efficiency improvements among numerous other modernization or renovation measures.
[39] Required states to contribute funds worth 20% of the DOE grant toward energy projects supported by the grant.

financial institutions. Along with its lasting effects on state-level energy efficiency, ARRA established connections between state and local governments to advance building and transportation energy efficiency at the community level (see Sciortino, Nowak et al. 2011). In order to receive and spend funding provided through Energy Efficiency and Conservation Block Grants, local governments have developed knowledge and staff capacity to implement energy efficiency projects, providing a solid foundation for future programs. And as ARRA funds are spent down, states have begun prioritizing energy efficiency programs and incentives in their own capital budgets.

METHODOLOGY & RESULTS

States could earn up to seven (7) points in this policy area: two and one-half (2.5) points for financial incentives; one (1) point for residential and commercial disclosure policies; two (2) points for lead-by-example policies and programs in government buildings and fleets; and one and one-half (1.5) points for research and development programs. Table 30 presents the overall results of scoring on state initiatives.

Many of the programs in this section rely on federal grants for a portion of their funding. However, state programs funded solely through ARRA or another federal source did not earn points in the *State Scorecard*. Because ARRA funds came from the federal stimulus, the existence of ARRA-funded programs does not necessarily reflect the efforts of the state. We do recognize that some states are utilizing these federal funds in an exemplary fashion by creating innovative and effective energy efficiency programs. For ACEEE to complete an assessment of a state's handling of stimulus funds, however, would mean relying on fluctuating spending data and rests outside the scope of this report. Examples of exemplary ARRA-funded programs are presented in Sciortino & Eldridge (2010), on DOE's Weatherization & Intergovernmental Program website (http://www1.eere.energy.gov/wip/recovery_act.html), and in publications of the National Association of State Energy Officials (NASEO 2011).

Table 30. Summary of Scoring on State Government-Led Initiatives

State	Financial Incentives (2.5 pts.)	Building Energy Disclosure (1 pt.)	Lead by Example (2 pts.)	R&D (1.5 pts.)	Total Score (7 pts.)
California	2.5	0.5	2	1.5	6.5
Connecticut	2.5	0	2	1.5	6
New York	2.5	0.5	1.5	1.5	6
Massachusetts	2.5	0	2	1	5.5
Oregon	2.5	0	1.5	1.5	5.5
Tennessee	2.5	0	2	1	5.5
Alaska	2.5	0.5	1	1	5
Illinois	2.5	0	1.5	1	5
Kansas	1.5	0.5	2	1	5
Maryland	2.5	0	1.5	1	5
Alabama	2	0	2	0.5	4.5
Colorado	1	0	2	1.5	4.5
Delaware	2.5	0	2	0	4.5
Kentucky	2.5	0	1.5	0.5	4.5
Michigan	2	0	1.5	1	4.5
Minnesota	2	0	2	0.5	4.5
North Carolina	1	0	2	1.5	4.5
Pennsylvania	2.5	0	1	1	4.5
Virginia	2.5	0	1	1	4.5
Washington	1.5	0.5	2	0.5	4.5
New Hampshire	2.5	0	1.5	0	4
Ohio	2	0	1.5	0.5	4
Vermont	1.5	0	1.5	1	4
Wisconsin	1	0	1.5	1.5	4
Arizona	1	0	1.5	1	3.5
Georgia	0.5	0	2	1	3.5
Hawaii	0.5	0.5	2	0.5	3.5
Idaho	2.5	0	0.5	0.5	3.5
Iowa	1.5	0	1	1	3.5
Mississippi	1	0	2	0.5	3.5
Montana	1.5	0	2	0	3.5
Nebraska	1.5	0	0.5	1.5	3.5
New Jersey	1	0	1.5	1	3.5
Oklahoma	2.5	0	1	0	3.5
Texas	1	0	1.5	1	3.5
Utah	1	0	2	0.5	3.5
Florida	0	0	1.5	1.5	3

State	Financial Incentives (2.5 pts.)	Building Energy Disclosure (1 pt.)	Lead by Example (2 pts.)	R&D (1.5 pts.)	Total Score (7 pts.)
Missouri	1.5	0	1.5	0	3
New Mexico	1.5	0	1.5	0	3
Rhode Island	0.5	0	2	0.5	3
South Carolina	1.5	0	1.5	0	3
Nevada	1	0	1	0.5	2.5
Arkansas	0.5	0	1.5	0	2
District of Columbia	0.5	0.5	1	0	2
Indiana	1	0	1	0	2
Louisiana	1	0	1	0	2
Maine	0	0.5	1.5	0	2
South Dakota	0.5	0.5	1	0	2
West Virginia	0	0	1	0.5	1.5
Wyoming	1	0	0.5	0	1.5
North Dakota	0	0	0	0	0

Financial Incentives

We relied primarily on the Database of State Incentives for Renewables and Efficiency (DSIRE 2013) for information on current state financial incentive programs. We supplemented this data with a survey of state energy officials and with a review of state government websites and other online resources.

In this chapter, points were not given for utilities' customer-funded financial incentive programs, which are covered in Chapter 2, Utility and Public Benefits Programs and Policies. Programs solely funded by ARRA (see Table 29) were also not counted. Acceptable sources of funding include state appropriations or bonds, oil overcharge revenues, auction proceeds from the Regional Greenhouse Gas Initiative, other non-customer sources, and tax incentives. Tax incentives were also included in the scoring. While there is some overlap of state and customer funding, for example where state R&D is funded through a systems benefits charge, this category is designed to capture energy efficiency initiatives not already covered in Chapter 2, Utilities.

States earned up to two and one-half (2.5) points for major financial incentive programs that encourage the purchase of energy-efficient products. These programs were judged on their relative strength, customer reach, and impact.[40] Incentive programs generally received one-half (0.5) point each, but several states have major incentive programs that were deemed worth one (1) point each; these included Alaska, Idaho, Iowa, Kansas, Nebraska, New Hampshire, Texas, Washington, and Wisconsin.

Table 31 lists the basis for our scoring of state financial incentives.

[40] "Energy-efficient products" include any product or process that reduces energy consumption. While renewable energy technologies such as solar hot water heating may reduce energy consumption, they are not included because they are typically part of broader renewable energy incentive packages that would not result in energy efficiency gains.

Table 31. State Scoring on Major Financial Incentive Programs

State	Major State Financial Incentives for Energy Efficiency	Score (2.5 pts.)
Alaska	Major rebate program (Home Energy Rebate Program); multiple loan programs; grant program	2.5
Massachusetts	Alternative Energy and Energy Conservation Patent Exemption (personal & corporate); grant, rebate, and bond programs	2.5
New York	Green Jobs Green NY Program; several rebate, loan, and grant programs; Energy Conservation Improvements Property Tax Exemption	2.5
Oregon	Residential and business energy tax credits; several loan programs; one grant program	2.5
Pennsylvania	State-led Alternative Energy Investment Fund; three grant and three loan programs	2.5
Tennessee	Energy Efficient Schools Initiative (loans and grants); one grant and one loan program; sales tax credit for emerging energy industry	2.5
Connecticut	One rebate, one loan, and one grant program; sales tax exemption for energy-efficient products; Clean Energy Communities incentive program	2.5
Illinois	Multiple grant programs; three rebate, two loan, and one bond program	2.5
Kentucky	Three grant programs; personal and corporate energy efficiency tax credits; loan program for state agencies; sales tax exemption for energy-efficient products	2.5
Maryland	Smart Energy Communities Program; four loan programs; one rebate program	2.5
New Hampshire	Two major loan programs (Business Energy Conservation Revolving Fund and Municipal Energy Reduction Fund); one rebate program	2.5
Virginia	Energy Leasing Program for state-owned facilities; Clean Energy Manufacturing Grant Program; one loan program; personal and property tax incentives	2.5
Delaware	Two loan and two grant programs; one rebate program for energy-efficient new homes	2.5
Idaho	Income tax deduction for energy efficiency improvements; grant program for school districts; one major low-interest loan program	2.5
Oklahoma	Energy Efficient Residential Construction Tax Credit (personal & corporate); three loan programs	2.5
California	Two grant programs for school facilities; sales tax exemption for alternative energy manufacturing equipment (includes energy efficiency); rebate program (Energy Upgrade California); loan program for public sector projects	2.5
Minnesota	Four loan programs	2
Michigan	Two loan programs; AgriEnergy Program; one rebate program	2
Ohio	Energy Loan Fund and one other loan program; property tax exemption for energy-efficient projects	2
Alabama	Two state-funded loan programs; WISE Home Energy Program (rebates and loans)	2
Montana	Energy conservation installation tax credit; tax deduction for energy-conserving investment; one loan program	1.5
Iowa	Major loan program (Iowa Energy Bank); one grant program	1.5
Kansas	Major loan program (Efficiency Kansas); one grant program	1.5
New Mexico	Sustainable Building Tax Credit (personal & corporate); bond program	1.5
South Carolina	Tax credit for purchase of new energy-efficient manufactured homes; sales tax cap on energy-efficient manufactured homes; one loan program	1.5
Missouri	Two loan programs; tax deduction for home energy efficiency improvements	1.5

State	Major State Financial Incentives for Energy Efficiency	Score (2.5 pts.)
Nebraska	Major loan program (Dollar and Energy Savings Loans); reduced rate financing for ENERGY STAR homes	1.5
Washington	Major grant program for energy efficiency in public facilities and local communities; Washington Farm Energy Program	1.5
Vermont	Two loan programs, Weatherization Trust Fund	1.5
Colorado	Mortgage discount for ENERGY STAR homes	1
North Carolina	One rebate and one loan program	1
Texas	Major loan program (Texas LoanSTAR)	1
Wisconsin	Major loan program (Clean Energy Manufacturing Loan Program)	1
Arizona	Property tax exemption for energy-efficient building components	1
Louisiana	Home Energy Loan Program; one rebate program	1
Mississippi	One loan program; one public sector lease program for energy-efficient equipment	1
Nevada	Wide-reaching property tax abatement for green buildings	1
Utah	Two loan programs for state-owned buildings and schools	1
Wyoming	One grant and one loan program	1
Indiana	One grant and one rebate program	1
New Jersey	Edison Innovation Clean Energy Manufacturing Fund (grants and loans); Edison Innovation Green Growth Fund Loan program	1
District of Columbia	One rebate program	0.5
Arkansas	Loan program for small businesses	0.5
Georgia	Corporate Clean Energy Tax Credit	0.5
South Dakota	One loan program	0.5
Hawaii	One loan program	0.5
Rhode Island	School Grant Program	0.5
Maine	None	0
North Dakota	None	0
Florida	None	0
West Virginia	None	0

Figure 6. State Financial and Information Incentives: Leading and Trending States

Alaska: Alaska uses a substantial amount of state appropriations to fund energy efficiency incentive programs. The Home Energy Rebate Program utilizes $160 million in state funding appropriated in 2008, a major investment relative to the state's population. The program allows rebates of up to $10,000 based on improved efficiency and eligible receipts. Energy ratings are required before and after the home improvements. The program also provides expert advice on energy efficiency improvements for consumers and tracks savings.

Tennessee: Tennessee has partnered with Pathway Lending to provide low-interest energy efficiency loans to businesses. The state also offers energy efficiency grants to state government agencies, businesses, and utility districts for projects that promote energy efficiency, clean energy technologies, and improvements in air quality. Tax credits are also available for the manufacture of energy-efficient technologies.

Connecticut: Connecticut offers many financial incentives at the state level, targeted at a variety of sectors. The state grant program helps schools fund efficiency improvements to heating systems. Several state programs are aimed at residential energy efficiency, including loans for energy efficiency improvements and complementary energy evaluations. The state also works with communities across the state through its Clean Energy Communities program, which engages towns across the state to reduce their municipal energy use by 20% and sets goals and offers rewards for increased efficiency for both businesses and residents in a community.

Building Energy Use Disclosure Requirements

Disclosure policies require commercial and/or residential building owners to disclose their building's energy consumption to prospective buyers, lessees, or lenders. Our review of energy-use disclosure laws is based on policy information compiled by the Institute for Market Transformation's BuildingRating.org project (IMT 2013). States with energy-use disclosure laws in place received one-half (0.5) point each for commercial and residential policies. States with both policies in place received one (1) point.

Disclosure laws are an emerging strategy in energy efficiency policy, and no states currently require both commercial and residential disclosure. More often, these policies are pursued by municipalities.[41] However, several states are taking the lead in requiring building energy use disclosure, and as disclosure policies become more common, it is likely that states will expand the scope of their policies to target both commercial and residential markets. State disclosure policies are presented in Table 32.

[41] For more information on how municipalities are encouraging building energy disclosure see ACEEE's *2013 City Energy Efficiency Scorecard* **(REF)** and *Residential Energy Use Disclosure: A Review of Existing Policies* (Cluett & Amann 2013).

Table 32. State Disclosure Policies

State	Disclosure Type	Building Energy Use Disclosure Requirements	Score (1 pt.)
Alaska	Residential	Alaska statute AS.34.70.101 requires the release of utility data for residential buildings at the time of sale.	0.5
California	Commercial	Assembly Bill 1103 requires nonresidential building owners or operators to disclose the energy consumption data consistent with the ENERGY STAR rating system to buyers, lenders, and lessees.	0.5
District of Columbia	Commercial	The Clean and Affordable Energy Act of 2008 requires privately-owned commercial buildings to be benchmarked using Portfolio Manager on an annual basis. Results will be published on a publicly available online database.	0.5
Hawaii[1]	Residential	§508D-10.5 requires residential property owners to disclose energy-efficiency consumer information at the time of sale or lease.	0.5
Kansas	Residential	HB 2036 requires builders or sellers of new residential single-family or multi-family buildings of four units of less to disclose information regarding the energy efficiency of the structure to buyers (or prospective buyers) prior to the signing of the contract to purchase and prior to the closing of the sale.	0.5
Maine	Residential	H.P. 1468 requires the disclosure of an energy efficiency checklist and allows for the release of audit information of residential buildings. This policy is triggered at the time of rental and can be triggered at the time of sale.	0.5
New York	Residential	Beginning in 1981, the Truth in Heating law required the release of utility data of residential buildings at the time of sale or rental.	0.5
South Dakota	Residential	SB 64 (2009) established certain energy efficiency disclosure requirements for new residential buildings. This policy is triggered at the time of sale.	0.5
Washington	Commercial	SB 5854 (2009-10) required all nonresidential customers and qualifying public agency buildings to maintain records of energy data with an energy star rating system. Resulting metrics will be disclosed to a prospective buyer, lessee, or lender.	0.5

Sources and notes: Disclosure policies based on IMT (2013); [1]Jim Flanagan Associates (2013)

Figure 7. State Energy Disclosure Policies: Leading States

Kansas: In 2003, Kansas passed a law requiring the disclosure of energy efficiency information of new homes (K.S.A. 66-1228). The state developed a standard reporting format for builders and sellers of new homes in which the home's features are compared to the state's energy code guidelines. The energy rating law was amended in 2007 to move the time of disclosure from the time of closing to the time the house is being shown. A completed energy efficiency checklist is required to be made available to buyers or potential buyers.

District of Columbia: By 2014, all commercial and multifamily buildings over 50,000 square feet will be required to report benchmarking data to the District on a yearly basis. EPA's ENERGY STAR Portfolio Manager is used as standard for a building's energy performance, including total energy use, energy intensity, and carbon emissions. In the District, 266 buildings, representing 90 million square feet, have taken the next step and been certified with the ENERGY STAR label. Prior to April 2013, District buildings of more than 150,000 square feet were required to report their 2012 energy and water use to the District Department of the Environment. The scope of the policy is set to expand in upcoming years, and will include all District buildings (commercial and multifamily) of more than 50,000 square feet.

"Lead by Example"

Our review of states' lead-by-example initiatives is based on information from the Database of State Incentives for Renewables and Efficiency (DSIRE 2013), a survey of state energy officials, and independent research. States could earn up to two (2) points in the lead-by-example category: one-half (0.5) point for energy savings targets in new and existing state buildings; one-half (0.5) point for a benchmarking requirement for public facilities; one-half (0.5) point for energy performance savings contracting activities; and one-half (0.5) point for fleet fuel efficiency mandates.

Energy savings targets must commit state government facilities to a specific energy reduction goal over a distinct time period. A benchmarking policy refers to a requirement that all buildings undergo an energy audit or have their energy performance tracked using a recognized tool such as the EPA's Portfolio Manager. Large-scale public-sector energy benchmarking programs could also qualify for the one-half point.

Scoring on activities related to energy savings performance contracting was based on three metrics: encouragement, leadership, and resources. Descriptions of qualifying actions are described in Table 33. A state was awarded one-half (0.5) point if it satisfied at least two of the three criteria.

Table 33. Scoring Criteria for ESPC Policies and Programs

Scoring Criteria for Energy Service Performance Contracts	
States that satisfied at least two of the following three criteria receive one-half (0.5) point.	
Criteria	**Qualifying Action**
Encouragement	The state explicitly promotes the usage of ESPCs to improve the energy efficiency of public buildings through statutory requirements, recommendations, or explicit preference for using ESPCs; executive orders that promote or require ESPCs; and/or financial incentives for agencies seeking to use ESPCs.
Leadership	The state houses a program that directly coordinates energy savings performance contracting, or a specific state agency serves as lead contact for implementing ESPCs.
Resources	The state offers documents that streamline and standardize the ESPC process, including a list of prequalified service companies, model contracts, and/or a manual that lays out procedures required to order for state agencies to utilize ESPCs.

For state fleet initiatives, states received credit only if the plan or policy for increasing the efficiency of the state's fleet presented a specific, mandatory requirement. State requirements for the procurement of alternative-fuel vehicles that gave only a voluntary option to count efficient vehicles were not included because, although they may have environmental benefits, they will likely not result in improved fuel economy.

States' scores for lead-by-example initiatives are presented in Table 34.

Table 34. State Scoring on Lead-by-Example Initiatives

State	Benchmarking Requirements for Public Building	New and Existing State Building Requirements	Efficient Fleets	ESPC Policy and Programs	Score (2 pts.)
Alabama	•	•	•	•	2
California	•	•	•	•	2
Colorado	•	•	•	•	2
Connecticut	•	•	•	•	2
Delaware	•	•	•	•	2
Georgia	•	•	•	•	2
Hawaii	•	•	•	•	2
Kansas	•	•	•	•	2
Massachusetts	•	•	•	•	2
Minnesota	•	•	•	•	2
Mississippi	•	•	•	•	2
Montana	•	•	•	•	2
North Carolina	•	•	•	•	2
Rhode Island	•	•	•	•	2
Tennessee	•	•	•	•	2

State	Benchmarking Requirements for Public Building	New and Existing State Building Requirements	Efficient Fleets	ESPC Policy and Programs	Score (2 pts.)
Utah	•	•	•	•	2
Washington	•	•	•	•	2
Arizona	•	•		•	1.5
Arkansas	•	•		•	1.5
Florida		•	•	•	1.5
Illinois		•	•	•	1.5
Kentucky	•	•		•	1.5
Maine		•	•	•	1.5
Maryland	•	•		•	1.5
Michigan	•	•		•	1.5
Missouri		•	•	•	1.5
New Hampshire	•	•	•		1.5
New Jersey	•	•		•	1.5
New Mexico		•	•	•	1.5
New York	•	•		•	1.5
Ohio	•	•		•	1.5
Oregon	•	•		•	1.5
South Carolina	•	•		•	1.5
Texas	•	•		•	1.5
Vermont	•	•	•		1.5
Wisconsin		•	•	•	1.5
Alaska	•	•			1
District of Columbia	•	•			1
Indiana		•		•	1
Iowa	•	•			1
Louisiana		•		•	1
Oklahoma	•	•			1
Pennsylvania		•		•	1
South Dakota	•	•			1
Virginia		•		•	1
West Virginia	•	•			1
Nevada		•		•	1
Idaho				•	0.5
Nebraska	•				0.5
Wyoming				•	0.5
North Dakota					0

Figure 8. Lead-by-Example Initiatives: Leading and Trending States

Hawaii: Hawaii's lead-by-example program offers a comprehensive set of services to state agencies. Aggressive policies underpin the program and include a benchmarking requirement that all state agencies evaluate the energy efficiency in existing buildings of qualifying size and energy characteristics. Each agency must identify opportunities for increased energy efficiency by setting benchmarks for these buildings using ENERGY STAR Portfolio Manager or a similar tool, and buildings must be retro-commissioned every five years. In addition, new state buildings must meet LEED Silver standards. As a result of Hawaii's lead-by-example program, in 2011 total state agency electricity consumption was 4.6% below that of the baseline year of 2005.

Minnesota: Over the past decade, the state of Minnesota has shown its commitment to sustainable buildings by providing leadership, setting high performance standards, and implementing an integrated framework of programs that provide a comprehensive system for designing, managing, and improving building energy performance. Beginning with aggressive standards for state buildings based on the long-term goal of having a zero-carbon building stock by 2030, the state offers a complementary benchmarking program for tracking energy use, and the Public Building Enhanced Energy Efficiency Program that aids in implementing retrofits. Minnesota also requires on-road vehicles owned by state departments to reduce gasoline consumption by 50% by 2015. Additionally, new on-road vehicles must also have a fuel efficiency rating that exceeds 30 mpg for city usage and 35 miles per gallon for highway usage.

Mississippi: In 2013, the Mississippi Energy Sustainability and Development Act went into effect, requiring all state agencies to report energy consumption or face penalties. State agencies work with the Mississippi Development Authority Energy and Natural Resources Division to develop energy management plans. The state also set a goal of achieving 20% energy savings in public facilities by 2020. To reach its energy savings goals, the state significantly upgraded its energy codes for both public and private buildings. Mississippi is also working to improve its fleet efficiency, requiring at least 75% of all state vehicles to meet fuel economy standards of at least 40 miles per gallon by July 1, 2014.

Research and Development

Our review of state energy efficiency research and development (R&D) institutions was based on the *National Guide to State Energy Research Centers* (ASERTTI 2013), a survey of state energy officials and other secondary research. In our scoring of this metric, one-half (0.5) point was awarded for each major R&D program dedicated to energy efficiency that is funded by the state government, including programs administered by state government agencies, public-private partnerships, and university programs.[42] Large programs received one (1) point. Because R&D funding often fluctuates and it is difficult to determine the dollar amount that specifically supports energy efficiency, devising a quantitative metric based on R&D program funding or staffing levels is currently outside the scope of this

[42] Institutions that are primarily focused on renewable energy technology or alternative fuel RD&D do not receive credit in the Scorecard. In addition, programs that serve primarily an educational or policy development purpose also do not receive points.

report. However, this year we did attempt to collect information about energy efficiency R&D budgets from our survey of state energy officials. For more information, see our discussion at the end of this chapter of potential new metrics for state-led initiatives.

Table 35. State Scoring on R&D Programs

State	Major R&D Programs	Score (1.5 pts.)
California	The California Energy Commission's Public Interest Energy Research program, University of California-Davis' Center for Water-Energy Efficiency and the Energy Efficiency Center, and University of California-Los Angeles' Center for Energy Science and Technology Advanced Research and Smart Grid Energy Research Center	1.5
Colorado	Colorado State University's Engines and Energy Conversion Lab and Institute for the Built Environment, University of Colorado-Boulder's Renewable and Sustainable Energy Institute, Colorado School of Mines' Research in Delivery, Usage, and Control of Energy, and the Center for Renewable Energy Economic Development, Colorado Energy Research Collaboratory	1.5
Connecticut	University of Connecticut's Center for Clean Energy Engineering, The University of Connecticut's Fraunhofer Center for Energy Innovation, Connecticut Center for Advanced Technology	1.5
Florida	University of Central Florida's Florida Solar Energy Center, Florida State University's Energy and Sustainability Center, University of Florida's Florida Institute for Sustainable Energy, University of South Florida's Clean Energy Research Center and University of Florida's Florida Energy Systems Consortium	1.5
Nebraska	The Nebraska Center for Energy Sciences Research, the Energy Savings Potential program, and University of Nebraska Utility Corporation	1.5
New York	The New York State Energy Research and Development Authority, State University of New York's Center for Sustainable & Renewable Energy, Syracuse University's Building Energy and Environmental Systems Laboratory, City University of New York's Institute for Urban Systems, and Albany State University's Energy and Environmental Technology Application Center (E2TAC)	1.5
North Carolina	The North Carolina Solar Center, North Carolina A&T State University's Center for Energy Research and Technology, and Appalachian State University's Energy Center	1.5
Oregon	The Oregon Built Environment and Sustainable Technologies Center, University of Oregon's Energy Studies in Building Laboratory and Baker Lighting Lab, Portland State University's Renewable Energy Research Lab, the Energy Trust of Oregon, and the Oregon Transportation Research and Education Consortium	1.5
Wisconsin	The Energy Center of Wisconsin, Wisconsin Focus on Energy, and University of Wisconsin's Solar Energy Lab	1.5
Alaska	The Cold Climate Housing Research Center, the Emerging Energy Technology Fund	1
Arizona	The Sustainable Energy Solutions Group of Northern Arizona State and Arizona State University's LightWorks Center	1
Georgia	The Southface Energy Institute and Georgia Institute of Technology's Brook Byers Institute for Sustainable Systems	1

State	Major R&D Programs	Score (1.5 pts.)
Illinois	University of Illinois at Chicago's Energy Resources Center, The Illinois Sustainable Technology Center	1
Iowa	The Iowa Energy Center, research support through the Iowa Economic Development Authority	1
Kansas	Studio 804, Inc., Wichita State University's Center for Energy Studies	1
Maryland	University of Maryland's Energy Research Center and the Maryland Clean Energy Technology Incubator	1
Massachusetts	The Massachusetts Energy Efficiency Partnership and University of Massachusetts-Amherst's Center for Energy Efficiency and Renewable Energy	1
Michigan	The Michigan NextEnergy Center and Oakland University in Rochester's Clean Energy Research Center	1
New Jersey	The Edison Innovation Clean Energy Fund and the Rutgers Energy Institute	1
Pennsylvania	Leigh University's Energy Research Center and Penn State's Indoor Environment Center	1
Tennessee	University of Tennessee partnerships with Oak Ridge National Laboratory and the Electric Power Research Institute, CURENT	1
Texas	Texas A&M's Engineering Experiment Station and University of Texas-Austin's Center for Energy and Environmental Resources	1
Vermont	The Center for Energy Transformation and Innovation	1
Virginia	Riverstone Energy Centre (the Modeling and Simulation Center for Collaborative Technology and R&D Center for Advanced Manufacturing and Energy Efficiency	1
Alabama	University of Alabama's Center for Advanced Vehicle Technologies	0.5
Hawaii	The Hawaii Natural Energy Institute at the University of Hawaii	0.5
Idaho	The Center for Advanced Energy Studies	0.5
Kentucky	University of Louisville's Conn Center for Renewable Energy Research	0.5
Minnesota	Conservation Applied Research and Development Program	0.5
Mississippi	Mississippi State University's Energy Institute	0.5
Nevada	The Center for Energy Research at University of Nevada-Las Vegas	0.5
Ohio	Ohio State University's Center for Energy, Sustainability, and the Environment	0.5
Rhode Island	Sustainable Energy Program at the URI Outreach Center	0.5
Utah	Utah State University	0.5
Washington	Northwest Building Energy Technology Hub	0.5
West Virginia	West Virginia University's Advanced Energy Initiative	0.5

Notes: See Appendix G for expanded descriptions of state energy efficiency RD&D program activities.

Figure 9. State Research, Development, and Demonstration Initiatives: Leading and Trending States

Colorado: The state of Colorado is demonstrating leadership in areas of energy efficiency. State universities including Colorado State University, the University of Colorado, and the Colorado School of Mines have displayed a commitment to energy efficiency by dedicating research centers and facilities to the development of energy efficiency and clean energy technologies. The Center for Renewable Energy Economic Development also plays a major role in Colorado's energy efficiency activities by promoting and supporting new clean tech companies throughout the state.

New York: The New York State Energy Research and Development Authority (NYSERDA) is an outstanding model of an effective and influential research and development institution. Its RD&D activities include a wide range of energy efficiency and renewable energy programs organized into seven program areas: energy resources; transportation and power systems; energy and environmental markets; industry; buildings; transmission and distribution; and environmental research.

Oregon: Oregon boasts an impressive array of organizations committed to energy efficiency. The Oregon Built Environment and Sustainable Technologies Center promotes cutting-edge technology related to energy efficiency and green buildings, the Energy Trust of Oregon provides funding for the testing of emerging technologies specifically related to utilities, and the Oregon Transportation Research and Education Consortium supports innovation specifically geared toward energy efficiency in the areas of land use and transportation.

Florida: Florida's universities host a wide array of energy efficiency research. The University of Florida's Institute for Sustainable Energy performs research on efficient construction and lighting, and has a faculty of over 150 spread among 22 energy research centers. The University of Central Florida's Solar Energy Center focuses on energy-efficient buildings, schools, and standards, and has a similarly large faculty. The state created the Florida Energy Systems Consortium to bring universities together to share their energy-related expertise. Eleven universities participate in the working group, conducting research and development on innovative energy systems that lead to improved energy efficiency and expanded economic development for the state.

POTENTIAL METRICS

During the data collection process for the *2013 State Scorecard,* we examined a variety of new metrics that could more accurately and comprehensively reflect the efforts states are making to improve energy efficiency across sectors. This year, we attempted to refine our analysis of research and development programs by collecting data on R&D budgets. We also surveyed state energy offices for budgets for incentive programs. Ultimately, the data returned to us was not robust enough to add to our analysis of state-led energy efficiency programs. However, it is our hope that these data will eventually become more widely available.

Agricultural Efficiency Programs

We also conducted a survey of state agricultural offices for this year's *State Scorecard.* Agriculture, as a whole, is a highly energy-intensive industry. Agriculture uses significantly more energy per unit of output than does most plastics or consumer goods manufacturing (EIA 2013c). However, the energy intensity of different types of agriculture is very different, and energy is used in different ways. A rancher in Montana may be primarily concerned with vehicle fuel costs, while a wheat farm in Nebraska may use significant amounts of energy on irrigation pumps, and a chicken grower in Delaware might have high electricity bills due to lighting. Additionally, focusing on electricity and natural gas use covers only a small portion of agricultural energy use. Many farmers are located far from natural gas lines, and rely on propane or diesel fuel. Pesticides and fertilizers are also extremely energy-intensive to produce, and represent a significant indirect on-farm energy use. Often, commercial or industrial energy efficiency programs are not appropriate for agriculture. Agricultural energy efficiency programs must be responsive to farmers' unique needs.

The U.S. Department of Agriculture (USDA) offers a suite of on-farm energy efficiency programs, and a number of states offer additional assistance. This year, we attempted for the first time to collect data on these state-led agricultural programs; however, we found that it was not possible to separate agricultural programs from the array of other incentives for energy efficiency offered by the state. In general, farm energy programs are not operated by a state's department of agriculture, although there are exceptions. Most states administer their farm energy programs through the state energy office or the office of the governor (for example, Michigan's AgriEnergy program is run by the Department of Energy, Labor, and Economic Growth and is included in our scoring of state incentives for energy efficiency). While these agricultural programs are certainly important, the low response rate to our survey made it impossible to score states on this metric. Our survey did return several excellent examples of state-led energy efficiency programs focused on the agricultural sector, and these are presented in Figure 10.

Figure 10. Leading State Policies: Agriculture

Washington: The Washington Farm Energy Program is a newly-developed program in Washington State. The program currently targets the dairy industry, but plans to expand to other kinds of agriculture. The goal of the program is to assist farmers in completing energy audits and develop recommendations for energy-saving measures. The program is notable for taking a "whole farm" approach to energy, addressing both direct energy use (lighting, heat, ventilation, etc.) as well as indirect energy use (such as fertilizers, pesticides, and water use). The program leverages funding from USDA, including the Environmental Quality Incentives Program (EQIP) and Renewable Energy for America Program (REAP), in addition to utility incentives and other funding sources.

Kentucky: The Kentucky On-Farm Energy Program provides funding to farmers for energy efficiency upgrades or renewable energy installations. Eligible equipment includes, but is not limited to, lighting, motors, processing equipment, ventilation, and building upgrades. Grants cannot exceed $15,000 or 50% of total costs over the life of the program.

Missouri: The Missouri Agricultural Energy Savings Team: A Revolutionary Opportunity (MAESTRO) offers a variety of forms of financial assistance for on-farm energy efficiency. MAESTRO provides energy audits to farmers and assistance with determining the most cost-effective changes to implement. Several different financing options, including cost-share grants and interest buy-down, are available to help fund energy efficiency upgrades. MAESTRO is funded by the Department of Energy.

Chapter 7: Appliance and Equipment Efficiency Standards

Author: Max Neubauer

INTRODUCTION

Every day in our homes, offices, and public buildings, we use appliances and equipment that are less energy efficient than other available models. While the energy consumption and cost for a single device may seem small, the extra energy consumed by less efficient products collectively adds up to a significant amount of wasted energy. For example, one device's battery charger may draw a small amount of electricity and waste an even smaller amount. However, with more than 1.7 billion battery chargers in the United States, the total amount of energy wasted is significant. Real and persistent market barriers, however, inhibit sales to consumers of more efficient models. Appliance efficiency standards overcome these barriers by initiating change in the manufacturer's—not the consumer's—actions, by requiring manufacturers to meet minimum efficiency levels for all products, thereby removing the most inefficient products from the market.

States have historically led the way when it comes to establishing standards for appliances and other equipment. California was the first state to introduce appliance standards in 1976. Many states, such as New York and Massachusetts, followed soon after. The federal government did not institute any national standards until 1988 through the passing of the National Appliance Energy Conservation Act of 1987, which created national standards based on those that had been adopted by California and several other states. Congress enacted additional national standards in 1988, 1992, 2005, and 2007. In general, these laws set initial standards for products and require the U.S. Department of Energy (DOE) to review and strengthen standards for specific products. All told, about 60 products are now subject to national efficiency standards.

In February 2009, President Obama signed a Presidential Memorandum that, over the next four years, requires the introduction or update of standards for 26 products. To date, DOE has set or updated 21 standards. When DOE rulemaking activity picks up, the impetus for states to set standards decreases. Conversely, when the national standard-setting process lags, activity in the states increases, serving as a catalyst for national standards. We find ourselves in the former category today. Unsurprisingly, this uptick in DOE activity coincides with only two states—California and Connecticut—having adopted new, higher standards in the last year.

Federal preemption generally prevents states from setting standards stronger than existing federal requirements for a given product. Under the general federal preemption rules applied by the Energy Policy Act of 2005 and the Energy Independence and Security Act of 2007, states that have set standards prior to federal enactment may enforce their state standards up until the federal standards become effective; states that have not yet set standards are preempted immediately. States that wish to implement their own standard after federal preemption must apply for a waiver; however, states remain free to set standards for any products that are not subject to national standards. These additional standards can have significant energy efficiency benefits, and set precedents for adopting new standards at other levels of government.

METHODOLOGY & RESULTS

A state could earn up to two (2) points for adopting appliance efficiency standards, based on the potential savings in billion British thermal units (BBtu) generated through 2030 by appliance efficiency standards not presently preempted by federal standards. The savings estimates, based on an analysis by the Appliance Standards Awareness Project and ACEEE (Lowenberger et al. 2012), were normalized based on the number of residential customers in each state so that the state was ranked on the amount of savings generated per customer. Each state earned up to two (2) points in increments of one-half (0.5) point. See Table 36 for the scoring methodology.

Table 36. Scoring Methodology for Savings from Appliance Standards

Energy Savings per Customer through 2030 (BBtu/customer)	Score
≤ 100	2
50 ≤ x < 100	1.5
10 ≤ x < 50	1
0 < x < 10	0.5
0	0

Table 37. State Scoring for Appliance Efficiency Standards

State	Energy Savings per Customer through 2030 (BBtu/customer)	Year most recent standards adopted	Score (2 pts.)
California*	129.1	2012	2
Oregon	37.1	2013	1
Connecticut	25.8	2011	1
Washington	8.7	2009	0.5
Arizona	8.5	2009	0.5
District of Columbia	0.7	2007	0.5
Maryland	0.7	2007	0.5
New Hampshire	0.6	2008	0.5
Rhode Island	0.6	2006	0.5
Georgia*	NA	2010	0.5
Texas*	NA	2010	0.5

Sources: Lowenberger et al. 2012; ASAP website as of September 2013

* Georgia and Texas adopted standards on plumbing products in 2010, as did California in 2007, which include toilets, urinals, faucet aerators, showerheads, and commercial pre-rinse spray valves. Since no analysis has yet been completed that estimates savings, we awarded Georgia and Texas half a point since the savings would at least be greater than zero. California was already rewarded the maximum number of points.

California, scoring the maximum of 2 points, continues to take the lead on appliance efficiency standards, most recently adopting standards for battery chargers and external

power supplies. Not only has California adopted the greatest number of standards, many other states' standards are based on California's, such as the television standards passed in Connecticut in 2011. Oregon passed new standards in 2013 for battery chargers, televisions, and double-ended quartz halogen lamps.

For the past several years, a number of states have received no credit for their standards in the *State Scorecard* due to either failing to implement signed legislation or because their state standards were preempted by federal standards. For example, New York passed legislation to create several state standards for which federal standards do not exist,[43] however the standards levels have yet to be officially developed. As a result, no savings have been generated, so in our *2013 State Scorecard* we again did not award any points for New York's efforts. . In our *2011 Scorecard*, Nevada earned credit for adopting standards for general service incandescent lamps that are more stringent than the existing federal standards. However, those standards were never enforced and it is likely that they never will ever be enforced. Additionally, Massachusetts, New Jersey, and Vermont all had their state standards preempted by federal standards.

It is worth noting that the standards adopted for plumbing products by California, Georgia, and Texas, which include standards for toilets, urinals, faucet aerators, showerheads, and commercial pre-rinse spray valves, will generate a significant volume of water savings. The energy savings come from the reduced need for hot water as well as the energy required to pump and treat both water and wastewater. These standards are particularly important in these three states, which have been experiencing frequent and persistent droughts in their regions at an increasing rate over the last decade.

Figure 11. Leading States: Appliance and Equipment Efficiency Standards

Oregon: Oregon has introduced a number of its own standards, beginning in 2002, concentrating on some of the most energy intensive appliances and equipment, such as hot tubs, televisions, and other consumer electronics. On June 13, 2013, through the signing of Senate Bill 692, Oregon added three new standards to its books for consumer battery chargers, televisions and double-ended quartz halogen lamps. This new legislation brings the number of non-preempted standards to 7, second only to California.

California: California was the first state in the country to adopt appliance and equipment efficiency standards. The authority to adopt appliance and equipment efficiency standards was bestowed upon the California Energy Commission as stipulated under the Warren-Alquist Act, which was enacted in 1974. Over the years, California has adopted standards on more than 50 products, many of which have subsequently become federal standards. California's 2006 Appliance Efficiency Regulations became effective on December 30, 2005, replacing all previous versions of the regulations. The Regulations create standards for twenty-one categories of appliances, including standards for both federally-regulated and non-federally-regulated appliances. Presently, California has adopted standards for ten products that are not covered by federal standards.

[43] The new standards in New York covered televisions, pool pumps, hot tubs, portable light fixtures, water dispensers, commercial hot-food holding cabinets, audio/video equipment, and digital TV adapters

Chapter 8: Conclusions

Energy efficiency policies and programs have continued to advance at the state level over the past year. A group of leading states remains committed to pursuing more efficient use of energy in transportation, buildings, and industry, fostering economic development in the energy efficiency services and technology industries and saving money for consumers to spur growth in all sectors of the economy.

A number of states have progressed—some rapidly—over the past few years in the pursuit of their energy efficiency goals. There has been significant movement both within and outside of the top tier of states, with Connecticut breaking back into the top five and Maine, one of the most improved states, swiftly increasing in rank due to legislative actions. Three other most improved states, Mississippi, Kansas, and West Virginia, are making significant strides from the lower tiers of states. This dynamism is reflected in growing utility program budgets and savings, as well as in the range of other actions states are taking to improve their energy efficiency through strong leadership and smart public policy.

Recently, states have also faced pushback on energy efficiency policies. EERS policies in Ohio, North Carolina, and Michigan all met significant pushback, although these policies remain in place. In New Mexico, conflict over energy efficiency standards led to compromise legislation that kept, but lowered, the long-term targets. Even states making progress in energy efficiency have faced resistance. The successful passage of Maine's energy bill came only after the state legislature voted to override the governor's veto. To date, support for energy efficiency policies has been strong enough to overcome rollback attempts, and in most states energy efficiency continues to earn strong support.

A wide gap remains, however, between states near the top and those at the bottom of the *State Scorecard* rankings. Market barriers and the regulated nature of the energy sector remain major challenges to energy efficiency investments. A regulatory environment that levels the playing field for energy efficiency—the fastest, cheapest, and cleanest energy resource—is critical to capturing its full range of benefits for states and for consumers.

LOOKING AHEAD

We see signs that many states will continue to raise the bar on their energy efficiency program and policy commitments in 2014 and beyond. For example, recently Mississippi's Public Service Commission unanimously voted to require large electric and gas utilities to begin offering efficiency programs. These quick start rules require utilities to have programs running within six months and to develop more comprehensive plans within three years. Oklahoma is also considering energy efficiency rules. Connecticut is another state that has made notable progress in energy efficiency, passing a piece of legislation that will double funding for ratepayer-funded energy efficiency programs in the upcoming year and requires decoupling to be approved by state regulators. Combined with financing programs established in 2012 and 2013, this level of program investment puts Connecticut on the path to capturing all cost-effective efficiency.

In addition, numerous states that only recently began implementing utility-sector energy efficiency programs, such as Michigan, Arkansas, Ohio, Indiana, and Arizona, will likely continue to ramp up efficiency program activity over the next few years to meet rising

goals.[44] Several of these states have faced political pushback, but as of August 2013 efficiency activity seemed poised to move forward. As noted in Chapter 2, combined utility spending on electric and natural gas efficiency programs is estimated to more than double from 2010 levels to $10.8 billion by 2025 if current savings targets are met, and to rise to between $15.6 and $16.8 billion if many states give energy efficiency a prominent role as a resource (Goldman et al. 2012, Barbose et al. 2013).

These projections of an increasing role for energy efficiency will not, however, occur in a vacuum. The impact and expansion of energy efficiency programs and policies in 2014 and beyond will be influenced by both state support for energy efficiency and external factors beyond states' control. Continued uncertainty around the economic recovery could dampen consumer demand for energy efficiency upgrades in the residential and commercial sectors, which would impact savings from efficiency programs. More concerning is the impact on budgets for efficiency. Some policymakers have responded to continued strain on state budgets by redirecting funds from utility customers or other sources originally meant for efficiency programs to shore up state finances in other areas,[45] or have not allocated energy efficiency budgets at a level high enough to meet mandated savings goals. Appropriations at the federal level have also been stunted due to the sequester, the effects of which trickle down to state-level budgeting.

Energy efficiency can save consumers money, drive investment across many sectors of the economy, and create jobs. While several states are consistently leading the way on energy efficiency and many more are dramatically increasing their efforts, significant opportunities remain to both sustain current efforts and continue to scale up. Energy efficiency is a resource abundant in every state, and reaping its full economic, energy security, and environmental benefits will require continued leadership from a wide range of stakeholders, including legislators, regulators, and the utility industry.

FURTHER RESEARCH

Addressing Data Needs

The scoring framework described at the beginning of this report is currently our best attempt to represent the myriad efficiency metrics as a quantitative "score." Any effort to convert state spending data, energy savings data, and adoption of best practice policies across six policy areas into one state energy efficiency "score" has obvious limitations. Here, we suggest a few areas of future research that will assist our continuing refinement of the *State Scorecard* scoring methodology and more accurately represent the changing landscape of energy efficiency in the states.

One of the most prominent limitations is access to recent, reliable data on the results of energy efficiency efforts. Many states do not gather data on the performance of energy efficiency policy efforts, obligating us to score them using a "best practices" approach for

[44] See Nowak et al. 2011 for a full discussion of how states are preparing to meet higher energy savings targets.
[45] New Jersey Governor Christie redirected $42.5 million from the state's Clean Energy Fund in fiscal year 2011 to cover state energy bills and will do the same in FY 2013 (which started July 1, 2012), with a reallocation of $210 million (NJ Spotlight 2012; State of New Jersey 2012). New Jersey also withdrew from the Regional Greenhouse Gas Initiative, which had been providing the state with substantial funding for energy efficiency projects.

some policy areas. To give just one example, to score states on building energy code compliance is difficult because the majority of states do not collect the required data to estimate their level of compliance. This year, we have expanded our "best practices" approach in this category, but performance metrics would allow for more objective and accurate judgment. While states should be applauded for adopting stringent building energy codes, the success of these codes at reducing energy consumption is unclear without a means to verify actual implementation.

In the utility sector, we urge states to systematically track and report statewide savings and spending levels for energy efficiency programs. The current resources available for state-by-state comparisons of energy efficiency program spending and savings in the utility sector do not capture the full set of programs available to customers. In particular, programs administered by third parties, public power generators, and cooperative and municipal utilities may be under-represented in the major datasets used in this report. We have made efforts to remedy this in the *2013 State Energy Efficiency Scorecard*, with some success, but future iterations of the report would benefit greatly from higher levels of reporting from utilities and administrators to the U.S. Energy Information Administration (EIA), the Consortium for Energy Efficiency (CEE), state utility commissions, and national groups such as the National Rural Electric Cooperative Association and the American Public Power Association.[46]

Furthermore, we would also like to capture spending and savings data for energy efficiency programs targeting home heating fuel and propane. This year we added a metric for incremental energy savings from natural gas efficiency programs, and in the future, depending in the availability of data sources, we may examine metrics for fuel oil and propane efficiency, as well.

Additional or Revised Metrics for Potential Inclusion

Throughout the *2013 State Scorecard*, we have included potential future metrics as they relate to each chapter. While we believe our data collection and scoring methodology are comprehensive, there is always room for adjustment. As the energy efficiency market continues to evolve, and data becomes more available, we will continue to adjust the scoring metrics within each chapter. Below, we present some additional metrics that currently fall outside the scope of our report, but that nonetheless represent important pathways toward efficiency.

In future versions of the *State Energy Efficiency Scorecard*, we hope to develop a more comprehensive and quantitative assessment of state efficiency programs that fall outside the realm of utility-sector and public benefits programs. Since the passage of the American Recovery and Reinvestment Act (ARRA) of 2009, scoring states on energy efficiency programs run by state governments has become a complex task. Our hope is that as ARRA funds run their course, states will become more adept at tracking and presenting program spending and savings data. We also hope to recognize state government and regulatory efforts to enable home- and business-owners to finance energy efficiency improvements

[46] See MJB&A (2011) for an assessment of the data gaps that inhibit the comprehensive benchmarking of utility energy efficiency spending and savings.

through on-bill financing and other innovative incentive programs. As discussed in Chapter 6, one possible metric to aid in comparing state financial incentives is the level and sustainability of budgets for these programs. In some cases, this information is available, but gathering it for all programs will continue to present challenges. State efforts related to energy efficiency research and development may also be amenable to comparison on the basis of budgets and staffing levels, although data availability is again an issue.

The deployment of smart meters in states across the United States has opened the way for overcoming some of the informational and motivational barriers that can lead to underinvestment in energy efficiency by consumers, especially in the residential sector. A new industry is emerging that aims to encourage energy savings among consumers by providing more frequent feedback on energy use, more tailored energy savings tips, and better customer engagement through social marketing and social media. Several non-energy policies can enable the growth of this area of energy efficiency, including data access policies such as the industry-led Green Button standard, state data privacy policies, and disclosure policies for building energy use. This year, we expanded our discussion of disclosure policies in Chapter 6, but more room for analysis of energy information policies remains. We will consider including an analysis of some of these enabling policies in future versions of the *State Energy Efficiency Scorecard*.

Another major area not currently scored in the *State Energy Efficiency Scorecard* is energy efficiency efforts in rural areas, particularly in the agricultural sector. This year, we attempted to collect data for the first time on energy efficiency efforts in the agricultural sector and found that data and information were extremely limited. While we already capture some of these efforts in programs run by state energy offices and rural electric cooperatives, there are likely other state and extension programs that are being missed. In the future, we will continue to leverage research on this sector to expand our analysis of agricultural energy efficiency programs.

We have also proposed several new metrics within the transportation sector. Data on vehicle miles traveled is widely available and can be used as an indicator of the success of a given state's travel efficiency policies. Transit ridership is another effective indicator of state policies that encourage the use of alternative modes of transportation. In the future, to emphasize the importance of state activities in encouraging the use of public transportation, we will consider scoring states on the annual percentage change in trips per capita. As high efficiency vehicles begin to saturate the market place, we also propose including metrics on policies to encourage their ownership. Finally, we plan to considerably increase our analysis of freight within the transportation sector.

The *2013 State Scorecard* includes information on all 50 states and the District of Columbia. However, we continue to consider expanding the scope of this report. As U.S. territories have ramped up energy efficiency efforts over the last several years with the receipt of ARRA funds, we hope that the data will become robust enough for reporting on select territory efforts in future editions of the *State Energy Efficiency Scorecard*.

References

[AASHTO] American Association of State Highway Transportation Officials. 2013. *Survey of State Funding for Public Transportation – FY2011 Data*. Washington, D.C.: American Association of State Highway Transportation Officials.

[ACEEE] American Council for an Energy-Efficient Economy. 2013. "State Energy Efficiency Policy Database." http://aceee.org/sector/state-policy. Washington, D.C.: American Council for an Energy-Efficient Economy.

[AEG] Applied Energy Group Inc. 2013. Personal communication with Craig Moran and Linda Wetzel.

[APTA] American Public Transportation Association. 2012. *The Benefits of Public Transportation*. Washington, D.C.: American Public Transportation Association

[AR PSC] Arkansas Public Service Commission. 2013. Personal communication with Eddy Moore. June 12.

[ASERTTI] Association of State Energy Research Technology and Transfer Institutions. 2013. *National Guide to State Energy Research Centers.* http://asertti.org/researchcenters/ASERTTI_State_Research_Guide.pdf.

[Avista] Avista Utilities. 2012. *2012 Annual Report Demand Side Management.* Spokane, WA: Avista. http://www.avistautilities.com/savings/dsm/dsmhistory/Documents/2012%20Annual%20Report%20Demand%20Side%20Management-Final.pdf.

Barbose, G.L., C.A. Goldman, I.M. Hoffman, and M.A. Billinglsey. 2013. *The Future of Utility Customer-Funded Energy Efficiency Programs in the United States: Projected Spending and Savings to 2025.* Berkeley, CA: Lawrence Berkeley National Laboratory.

[BCAP] Building Codes Awareness Project. 2013. "Online Code Environment & Advocacy Network." http://energycodesocean.org/. Washington, D.C.: Building Codes Awareness Project.

[BPA] Bonneville Power Administration. 2013. Personal communication with Kevin O'Sullivan. June 14.

Burr, A., C. Majersik, S. Stellberg, & H. Garrett-Peltier. 2012. *An Analysis of Job Creation and Energy Savings from Building Energy Rating and Disclosure Policy.* Washington, D.C.: Institute for Market Transformation. http://www.imt.org/uploads/resources/files/Analysis_Job_Creation.pdf.

[CARB] Air Resources Board, California Environmental Protection Agency. 2011. *Approved Regional Greenhouse Gas Reduction Targets*. Sacramento, CA. Air Resources Board, California Environmental Protection Agency.

[CEE] Consortium for Energy Efficiency. 2013. *2012 Annual Industry Report. Appendices: The Efficiency Program Industry by State and Region*. Boston, Mass.: Consortium for Energy Efficiency. http://library.cee1.org/sites/default/files/library/10533/CEE_Annual_Industry_Report.pdf

Center for Climate and Energy Solutions. 2012. "VMT Related Policies and Incentives." Arlington, VA: Center for Climate and Energy Solutions. http://www.c2es.org/us-states-regions/policy-maps/vehicle-miles-traveled.

[Census] United States Census Bureau. 2012. "Population Estimates." Washington, D.C.: United States Census Bureau. http://www.census.gov/popest/

Clean Cars Campaign. 2013. "State Action." http://cleancarscampaign.org/ Accessed May 2013.

Chittum, A. 2012. *CHP Methodology in the 2012 Scorecard*. ACEEE White Paper. http://aceee.org/white-paper/chp-methodology. Washington, D.C.: American Council for an Energy-Efficient Economy.

Cluett, R. & J. Amann. 2013. *Residential Energy Use Disclosure: A Review of Existing Policies.* http://www.aceee.org/research-report/a131. Washington, D.C.: American Council for an Energy-Efficient Economy.

[CO PUC] Colorado Public Utilities Commission. 2013. Personal communication with Rachel Ackermann. May 28.

[CPUC] California Public Utilities Commission. 2013. Personal communication with Amy Reardon. June 11.

[CT DEEP] Connecticut Department of Energy and Environmental Protection. 2013. Personal communication with Richard Rodrigue and Diane Duva. July 7.

[DDOE] District Department of the Environment. 2013. Personal communication with Taresa Lawrence. June 4.

[DNREC] Delaware Department of Natural Resources and Environmental Control. 2013. Personal communication with Cara Lampton. June 27.

[DOE] U.S. Department of Energy. 2013a. "Alternative Fuel and Advanced Vehicle Data Center: State Incentives and Laws." http://www.afdc.energy.gov/afdc/laws/state. Accessed June 2013. Washington, D.C.: U.S. Department of Energy, Energy Efficiency and Renewable Energy.

_____. 2013b. "Alternative Fuel and Advanced Vehicle Data Center: Electric Vehicle Charging Station Locations." http://www.afdc.energy.gov/fuels/electricity_locations.html. Accessed June 2013. Washington, D.C.: U.S. Department of Energy, Energy Efficiency and Renewable Energy.

____. 2013c. "Recovery Act." http://www1.eere.energy.gov/recovery/index.html. Accessed July 2013. Washington D.C.: U.S. Department of Energy.

____. 2012. *National Energy and Cost Savings for New Single- and Multifamily Homes: A Comparison of the 2006, 2009, and 2012 Editions of the IECC.* Washington, D.C.: U.S. Department of Energy, Energy Efficiency and Renewable Energy, Building Technologies Program.

____. 2011a. *2011 Buildings Energy Data Book.* http://buildingsdatabook.eere.energy.gov/. Washington, D.C.: U.S. Department of Energy, Energy Efficiency and Renewable Energy.

____. 2011b. *Comparison of Standard 90.1-2010 and the 2012 IECC with Respect to Commercial Buildings.* Prepared by Pacific Northwest National Laboratory. Washington, D.C.: U.S. Department of Energy.

[DOT] U.S. Department of Transportation. 2013a. *Highway Statistics Series 2011*. Washington, D.C.: U.S. Department of Transportation, Federal Highway Administration.

_____. 2013b. "National Transit Database." http://www.ntdprogram.gov/ntdprogram/data.htm. Accessed June 2013. Washington, D.C.: U.S. Department of Transportation. Federal Transit Administration.

[DSIRE] Database of State Incentives for Renewables and Efficiency. 2013. http://dsireusa.org/.

Dutzik, T. & P. Baxandall. 2013. *A New Direction: Our Changing Relationship with Driving and the Implications for America's Future*. Washington D.C.: U.S PIRG Education Fund

Efficiency Maine. 2013. Personal communication with Sadie Lloyd. June 17.

Efficiency Vermont. 2012. *2011 Gross to Net Factors*. Burlington, VT: Efficiency Vermont. http://www.efficiencyvermont.com/docs/about_efficiency_vermont/annual_reports/2011_Gross_to_Net_Report_EfficiencyVermont.pdf.

[EIA] U.S. Energy Information Administration. 2013a. "*Form EIA-826 Data Monthly Electric Utility Sales and Revenue Data*." Washington, D.C.: U.S. Department of Energy, Energy Information Administration. http://www.eia.gov/cneaf/electricity/page/eia826.html.

____. 2013b. *Annual Report of Natural and Supplemental Gas Supply and Disposition*. Form EIA-176. Washington, D.C.: U/S/ Department of Energy, Energy Information Administration. http://205.254.135.7/dnav/ng/ng_cons_num_a_EPG0_VN3_Count_a.htm.

____. 2013c. *Annual Energy Outlook.* http://www.eia.gov/forecasts/aeo/er/. Washington, D.C.: U.S. Department of Energy, Energy Information Administration.

____. 2013d. "Alternative Fuel Vehicle Data." http://www.eia.gov/renewable/afv/supply.cfm. Accessed June 2013. Washington, D.C.: U.S. Department of Energy, Energy Information Administration

____. 2012a. *Annual Electric Power Industry Report 2011.* Form EIA-861. Washington, D.C.: U/S/ Department of Energy, Energy Information Administration. http://www.eia.gov/cneaf/electricity/page/eia861.html.

____. 2012b. "Hawaii State Energy Profile Analysis." Washington, D.C.: U.S. Department of Energy, Energy Information Administration. http://205.254.135.7/state/state-energy-profiles-analysis.cfm?sid=HI.

Eldridge, M., M. Sciortino, L. Furrey, S. Nowak, S. Vaidyanathan, M. Neubauer, N. Kaufman, A. Chittum, and S. Black. 2009. *The 2009 State Energy Efficiency Scorecard.* Report E097. Washington, D.C.: American Council for an Energy-Efficient Economy. http://aceee.org/research-report/e097.

Eldridge, M., M. Neubauer, D. York, S. Vaidyanathan, A. Chittum, and S. Nadel. 2008. *The 2008 State Energy Efficiency Scorecard.* Washington, D.C.: American Council for an Energy-Efficient Economy.

Eldridge, M., W. Prindle, D. York, & S. Nadel. 2007. *The State Energy Efficiency Scorecard for 2006.* Washington, D.C.: American Council for an Energy-Efficient Economy.

Energy Trust of Oregon. 2013. Personal communication with Adam Shick. May 30.

[Entergy] Entergy New Orleans, Inc. 2012. *Energy Smart Annual Report*. New Orleans, LA: Entergy. http://www.entergy-neworleans.com/content/docs/Year_1_Energy_Smart_Annual_Report.pdf.

[EPA] Environmental Protection Agency. 2012. *Data Trends: Benchmarking and Energy Savings.* http://www.energystar.gov/ia/business/downloads/datatrends/DataTrends_Savings_20121002.pdf?bb67-a147. Accessed July 2013. Washington, D.C.: U.S. Environmental Protection Agency.

____. 2013. "*d*CHPP: Combined Heat and Power Partnership Funding Database." http://www.epa.gov/chp/funding/funding.html. Accessed March. Washington, D.C.: U.S. Environmental Protection Agency.

_____. 2009. *Clean Energy Lead by Example Guide: Strategies, Resources and Action Steps for State Programs.* http://www.epa.gov/statelocalclimate/documents/pdf/epa_lbe_full.pdf. Washington, D.C.: U.S. Environmental Protection Agency.

Foster, B., A. Chittum, S. Hayes, M. Neubauer, S. Nowak, S. Vaidyanathan, K. Farley, K. Schultz, and T. Sullivan. 2012. *The 2012 State Energy Efficiency Scorecard*. Washington, D.C.: American Council for an Energy-Efficient Economy.

Goldman, C. A., I. M. Hoffman, M. Billingsley & G. L. Barbose. 2012. "On a Rising Tide: The Future of U.S. Utility Customer-Funded Energy Efficiency Programs." In *Proceedings of the ACEEE 2012 Summer Study on Energy Efficiency in Buildings*. Washington, D.C.: American Council for an Energy-Efficient Economy.

Haeri, H. & M. S. Khawaja. 2012. "The Trouble with Freeriders: The Debate About Freeridership in Energy Efficiency Isn't Wrong, But It Is Wrongheaded." *Public Utilities Fortnightly,* March 2012. http://www.fortnightly.com/fortnightly/2012/03/trouble-freeriders.

Jim Flanagan Associates. 2013 Personal communication with Jim Flanagan. June 11.

[ICF] ICF International. 2013. "Combined Heat and Power Installation Database." http://www.eea-inc.com/chpdata/. Accessed March 22, 2013. Washington, D.C.: ICF International.

[IMT] Institute for Market Transformation. 2013. *Building Energy Performance Benchmarking and Disclosure*. Accessed June 2013. http://www.imt.org/rating.html.

[IURC] Indiana Utility Regulatory Commission. 2013. Personal communication with Brad Borum and Carmen Pippenger. June 10.

Itron. 2011. *Verification of Reported Energy and Peak Savings from the EmPOWER Maryland Energy Efficiency Programs: Final Report*. Prepared for the Maryland Public Service Commission. Oakland, CA: Itron.

[IL DCEO] Illinois Department of Commerce and Economic Opportunity. 2013. Personal communication with David Baker.

[IUB] Iowa Utilities Board. 2013. Personal communication with Gordon Dunn. May 31.

[KCC] Kansas Corporation Commission. 2013. Personal communication with Liz Brosius. June 5.

Kushler, M., S. Nowak, and P. Witte. 2012. *A National Survey of State Policies and Practices for the Evaluation of Ratepayer-Funded Energy Efficiency Programs*. Report U122. Washington, D.C.: American Council for an Energy-Efficient Economy. http://aceee.org/research-report/u122.

[LIPA] Long Island Power Authority. 2013. *2013 Approved Operating Budgets.* http://www.lipower.org/pdfs/company/investor/2013budget.pdf. Accessed September 2013.

Lowenberger, Amanda, Joanna Mauer, Andrew deLaski, Marianne DiMascio, Jennifer Amann, and Steven Nadel. 2012. *The Efficiency Boom: Cashing In on the Savings from Appliance Standards*. ACEEE Report A123/ ASAP-8. Washington, D.C.: American Council for an Energy-Efficient Economy.

[MA DOER] Massachusetts Department of Energy Resources. 2013. Personal communication with Sue Kaplan. May 31.

Mackres, E., K. Johnson, A. Downs, R. Cluett, S. Vaidyanathan, and K. Schultz. 2013. *The 2013 City Energy Efficiency Scorecard.* Report E13G. Washington, D.C.: American Council for an Energy-Efficient Economy.

[MAGEEPA] Massachusetts Electric and Gas Energy Efficiency Program Administrators. 2010. *Massachusetts Technical Reference Manual for Estimating Savings from Energy Efficiency Measures. 2011 Program Year – Plan Version.* http://www.ma-eeac.org/docs/MA%20TRM_2011%20PLAN%20VERSION.PDF.

[MD PSC] Maryland Public Service Commission. 2013. Personal communication with Stacy Sherwood. May 31.

[MEEA] Midwest Energy Efficiency Alliance. 2013. Personal communication with Gregory Ehrendreich. September 24.

[MI PSC] Michigan Public Service Commission. 2013. Personal communication with Karen Gould. June 13.

[MJB&A] M.J. Bradley & Associated. 2011. *Benchmarking Electric Utility Energy Efficiency Portfolios in the U.S.* http://www.ceres.org/resources/reports/benchmarking-electric-utilities-2011. Concord, Mass.: M.J. Bradley & Associates, LLC.

[MN DOC] Minnesota Department of Commerce. 2013. Personal communication with Jessica Burdette. June 10.

[MO PSC] Missouri Public Service Commission. 2013. Personal communication with John Rogers. May 31.

Molina, M., S. Watson, N. Kaufman, J.S. Laitner, E. Mackres, D. Trombley, and D. York. 2011. *Missouri's Energy Efficiency Potential: Opportunities for Economic Growth and Energy Sustainability.* Washington, D.C.: American Council for an Energy-Efficient Economy.

Molina, M., R.N. Elliott, and S. Vaidyanathan. 2010. *North Carolina's Energy Future: Electricity, Water, and Transportation Efficiency*. Washington, D.C.: American Council for an Energy-Efficient Economy.

Molina, M., M. Neubauer, M. Sciortino, S. Nowak, S. Vaidyanathan, N. Kaufman, and A. Chittum. 2010. *The 2010 State Energy Efficiency Scorecard*. Report E107. Washington, D.C.: American Council for an Energy-Efficient Economy.

[MT PSC] Montana Public Services Commission. 2013. Personal communication with Bob Decker. May 30.

Nadel, S., T. Kubo, and H. Geller. 2000. *State Scorecard on Utility Energy Efficiency Programs in 2000*. Report U004. Washington, D.C.: American Council for an Energy-Efficient Economy.

[NASEO] National Association of State Energy Officials. 2011. *U.S. State Energy Program: An Activity Report of U.S. State Energy Program Success Stories from the State and Territory*

Energy Offices. http://www.naseo.org/programs/sep/documents/SEP_Success_Stories.pdf. Alexandria, VA: National Association of State Energy Offices.

____. 2013. *State Energy Revolving Loan Funds – Overview and Trends.* http://www.naseo.org/Data/Sites/1/documents/selfs/state_energy_rlf_report.pdf. Alexandria, VA: National Association of State Energy Offices.

[NCFSA] National Conference of State Fleet Administrators. 2007. 2007 *NCSFA Target Membership Estimated Fleet Totals and Dollars (Reported by State Fleets).* http://www.ncsfa.net/PUBLICATIONS/Conference/2007%20NCSFA%20Est.%20Target%20Fleet$.pdf. Gaithersburg, Md.: National Conference of State Fleet Administrators.

[NCSC] National Complete Streets Coalition. 2012a. "State Level Complete Streets Policies." Washington, D.C.: National Complete Streets Coalition. http://www.completestreets.org/webdocs/policy/cs-state-policies.pdf.

_____. 2012b. "Complete Streets and High Gas Prices." Washington, D.C.: National Complete Streets Coalition. http://www.completestreets.org/webdocs/factsheets/cs-gasprices.pdf.

[NEEP-REED] Northeast Energy Efficiency Partnership. 2013. "Regional Energy Efficiency Database." http://www.neep-reed.org/.

[NEO] Nebraska Energy Office. 2013. Personal communication with Jerry Loos. June 10.

Neubauer, M., S. Nadel, J. Talbot, A. Lowenberger, D. Trombley, S. Black, S. Vaidyanathan, B. Foster, and J.S. Laitner. 2011. *Advancing Energy Efficiency Opportunities in Arkansas: Opportunities for a Clean Energy Economy*. Washington, D.C.: American Council for an Energy-Efficient Economy.

Neubauer, M., S. Watson, J. S. Laitner, J. Talbot, D. Trombley, A, Chittum, and S. Black. 2009. *South Carolina's Energy Future: Minding its Efficiency Resources*. Washington, D.C.: American Council for an Energy-Efficient Economy.

[NH PUC] New Hampshire Public Utilities Commission. 2013. Personal communication with James Cunningham. June 13.

[NM PRC] New Mexico Public Regulation Commission. 2013. Personal communication with John Reynolds. June 6.

Nowak, Seth, Martin Kushler, Michael Sciortino, Dan York, and Patti Witte. 2011. *Energy Efficiency Resource Standards: State and Utility Strategies for Higher Energy Savings.* Washington, D.C.: American Council for an Energy-Efficient Economy.

[NV PUCN] Public Utilities Commission of Nevada. 2013. Personal communication with Cristina Zuniga. June 27.

[NY DPS] New York Department of Public Service. 2010. *New York Standard Approach for Estimating Energy Savings from Energy Efficiency Programs*. Prepared by New York Evaluation Advisory Contractor Team and TecMarket Works. Albany, NY: New York Department of Public Service. http://www.dps.ny.gov/TechManualNYRevised10-15-10.pdf.

___. 2013. Personal communication with Deborah LaBelle. June 12.

[NYSERDA] New York State Energy Research and Development Authority. 2013. Personal communication with Victoria Engel-Fowles and Jennifer Meissner. June 7.

[OCC] Oklahoma Corporation Commission. 2013. Personal communication with Fairo Mitchell.

Pye, Miriam and S. Nadel. 1997. *Energy Technology Innovation at the State Level: Review of State Energy RD&D Programs*. Washington, D.C.: American Council for an Energy-Efficient Economy. http://www.aceee.org/research-report/e973.

[RI PUC] Rhode Island Public Utilities Commission. 2013. Personal communication with Nick Ucci. May 14.

Satchwell, A., C. Goldman, P. Larsen, D. Gilligan, and T. Singer. 2010. *A Survey of the U.S. ESCO Industry: Market Growth and Development from 2008 to 2011.* Berkeley, CA: Lawrence Berkeley National Laboratory. http://eetd.lbl.gov/ea/ems/reports/lbnl-3479e.pdf.

[SC ORS] South Carolina Office of Regulatory Staff. 2013. Personal communication with Allyn Powell. June 7.

Sciortino, M. & M. Eldridge. 2010. "The Growing Landscape of State Energy Efficiency Programs: A New Taxonomy." In *Proceedings of the 2010 ACEEE Summer Study in Buildings.* Washington, D.C.: American Council for an Energy-Efficient Economy.

Sciortino, M., M. Neubauer, S. Vaidyanathan, A. Chittum, S. Hayes, S. Nowak and M. Molina. 2011. *The 2011 State Energy Efficiency Scorecard.* Report E115. Washington, D.C.: American Council for an Energy-Efficient Economy.

Sciortino, M., S. Nowak, P. Witte, D. York, & M. Kushler. 2011. *Energy Efficiency Resource Standards: A Progress Report on State Experience.* Report U112. Washington, D.C.: American Council for an Energy-Efficient Economy.

[SD PUC] South Dakota Public Utilities Commission. 2013. Personal communication with Brian Rounds. June 7.

State of Massachusetts. 2012. *2013-2015 Massachusetts Joint Statewide Three-Year Electric and Gas Efficiency Plan*. November 2. http://www.mass.gov/eea/docs/doer/energy-efficiency/statewide-electric-and-gas-three-year-plan.pdf.

[SWEEP] Southwest Energy Efficiency Project. 2007. Geller, H., S. Baldwin, P. Case, K. Emerson, T. Langer, and S. Wright. *Utah Energy Efficiency Strategy: Policy Options.* Boulder, CO: Southwest Energy Efficiency Project.

____. 2013a. *Policies to Promote Electric Vehicles in the Southwest: A State Government Scorecard.* Boulder, CO: Southwest Energy Efficiency Project.

____. 2013b. Personal communication with Ellen Zuckerman. June 12.

[T4A] Transportation for America. 2012. *Thinking Outside the Farebox: Creative Approaches to Financing Transit Projects*. Washington, D.C. Transportation for America.

[TVA] Tennessee Valley Authority. 2011. *Integrated Resource Plan: TVA's Environmental and Energy Future*. http://www.tva.com/environment/reports/irp/pdf/Final_IRP_complete.pdf. Knoxville, TN: Tennessee Valley Authority.

[UT PSC] Utah Public Service Commission. 2013. Personal communication with Jamie Dalton. May 30.

[VEIC] Vermont Energy Investment Corporation. 2013. Personal communication with Carole Hakstian.

[WA UTC] Washington Utilities and Transportation Commission. 2013. Personal communication with Juliana Williams. June 12.

[WI PSC] Wisconsin Public Service Commission. 2013. Personal communication with Jolene Sheil. June 7.

York, D. and M. Kushler. 2002. *State Scorecard on Utility and Public Benefits Energy Efficiency Programs: An Update*. Washington, D.C.: American Council for an Energy-Efficient Economy.

_____. 2005. *ACEEE's 3rd National Scorecard on Utility and Public Benefits Energy Efficiency Programs: A National Review and Update of State-Level Activity.* Washington, D.C.: American Council for an Energy-Efficient Economy.

York, D., P. Witte, S. Nowak and M. Kushler. 2012. *Three Decades and Counting: A Historical Review and Current Assessment of Electric Utility Energy Efficiency Activity in the States*. Report U123. Washington, D.C.: American Council for an Energy-Efficient Economy. http://aceee.org/research-report/u123.

Appendix A: Electric Efficiency Program Budgets per Capita

State	2011 Budgets ($ million)	$ Per Capita
Massachusetts	515.7	77.59
Vermont	39.3	62.78
Rhode Island	61.4	58.46
Washington	344.8	49.99
Oregon	153.0	39.25
New Jersey	329.4	37.16
Connecticut	128.1	35.68
New York	668.9	34.18
California	1166.6	30.67
Iowa	90.6	29.47
Minnesota	156.0	29.00
Hawaii	35.6	25.57
Idaho	38.7	24.25
Maryland	139.2	23.66
Montana	21.0	20.89
Pennsylvania	257.0	20.14
District of Columbia	12.2	19.29
Arizona	124.0	18.92
Maine	23.4	17.60
Ohio	200.7	17.39
New Hampshire	22.9	17.34
Michigan	169.2	17.12
Arkansas	50.3	17.06
Illinois	208.6	16.20
Colorado	81.4	15.69
Nevada	42.0	15.22
Wisconsin	78.7	13.74
Utah	36.1	12.64
Wyoming	6.0	10.41
Florida	200.0	10.35
Indiana	62.7	9.59
New Mexico	19.7	9.45
Nebraska	17.5	9.43
Tennessee	58.2	9.01
Oklahoma	34.1	8.94
South Carolina	40.5	8.57
Kentucky	36.4	8.31
North Carolina	61.7	6.33
South Dakota	4.8	5.76
Texas	144.4	5.54
West Virginia	9.9	5.34
Missouri	26.3	4.37
Kansas	12.3	4.26
Delaware	3.8	4.14
Mississippi	11.9	3.99
Georgia	29.9	3.01
Alabama	10.1	2.09
Louisiana	3.7	0.80
Virginia	0.2	0.02
Alaska	0.0	0.00
North Dakota	0.0	0.00
US Total	**5,988.9**	**18.17**
Median	**40.5**	**15.22**

Sources: See Table 11 in main body of text. Calculation of per capita spending is based on population data from Census (2012)

Appendix B: Details of States' Energy Efficiency Resource Standards

State (Year Enacted) Policy Type Sector(s) Covered Applicability (% sales affected)	Description	Approx. Annual Electric Savings Target (2013+)[47]	Stringency	Reference	Score
Massachusetts (2009) EERS Electric and Nat. Gas IOUs, Co-ops, Muni's, Cape Light Compact (~80%)	Electric: 1.4% in 2010, 2.0% in 2011; 2.4% in 2012; 2.5% in 2013 increasing to 2.6% by 2015. Natural Gas: 0.63% in 2010, 0.83% in 2011; 1.15% in 2012; 1.08% in 2013 increasing to 1.19% by 2015. All cost-effective efficiency requirement.	2.6%	Binding	D.P.U. Order 09-116 through 09-120 D.P.U. Order 09-121 through 09-128 D.P.U. Order 12-100 through 12-111	3
Arizona (2009) EERS Electric and Nat. Gas IOUs, Co-ops (~59%)	Electric: Annual savings targets began at 1.25% of sales in 2011, ramping up to 2.5% in 2016 through 2020 for cumulative annual electricity savings of 22% of retail sales, of which 2% may come from peak demand reductions. Natural Gas: ~0.6% annual savings (for cumulative savings of 6% by 2020).	2.4%	Binding	Docket No. RE-00000C-09-0427, Decision 71436 Docket No. RE-00000C-09-0427, Decision 71819 Docket No. RG-00000B-09-0428 Dec. No. 71855	3
Rhode Island (2006) EERS Electric and Nat. Gas IOUs, Muni's (~99%)	Electric: Annual savings of 1.7% in 2012, 2.1% in 2013, 2.5% in 2014. EERS includes demand response targets. Natural Gas: Annual savings of 0.6% in 2012, 0.8% in 2013, and 1.0% in 2014. Utilities must acquire all cost-effective energy efficiency.	2.3%	Binding	R.I.G.L § 39-1-27.7 Docket 4284, 4295	3
New York (2008) EERS Electric and Nat. Gas Statewide Goal (100%)	Electric: 15% cumulative savings by 2015. Natural Gas: ~14.7% cumulative savings by 2020.	2.1%	Binding	NY PSC Order, Case 07-M-0548 NY PSC Order, Case 07-M-0748	3
Vermont (2000) Tailored Targets Electric Efficiency Vermont (100%)	Expected cumulative savings of ~6.6% from 2012 to 2014. EERS includes demand response targets. Efficiency Vermont must set budgets at a level that would realize all cost-effective energy efficiency.	2.0%	Binding	30 V.S.A. § 209; VT PSB Docket EEU-2010-06	3

[47] For utilities covered under the EERS policy. For some states, this would be significantly reduced if reported based on statewide sales.

State (Year Enacted) Policy Type Sector(s) Covered Applicability (% sales affected)	Description	Approx. Annual Electric Savings Target (2013+)[47]	Stringency	Reference	Score
Illinois (2007) EERS Electric and Nat. Gas Utilities with over 100,000 customers, Illinois DCEO (~89%)	Electric: 0.2% annual savings in 2008, ramping up to 1% in 2012, 2% in 2015 and thereafter. Annual peak demand reduction of 0.1% through 2018. Natural Gas: 8.5% cumulative savings by 2020 (0.2% annual savings in 2011, ramping up to 1.5% in 2019). Energy efficiency measures may not exceed an established cost-cap.	1.8%	Cost Cap	S.B. 1918 Public Act 96-0033 § 220 ILCS 5/8-103	3
Maryland (2008)[48] EERS Electric Statewide Goal (100%)	15% per-capita electricity use reduction goal by 2015 (10% by utilities, 5% achieved independently). 15% reduction in per capita peak demand by 2015, compared to 2007. The next round of targets are currently under discussion.	1.6%	Binding	Md. Public Utility Companies Code § 7-211	3
Maine (2009) EERS Electric and Nat. Gas Efficiency Maine (100%)	Electric and natural gas savings of 20% by 2020. Efficiency Maine operates under an all cost-effective mandate.	1.6%	Opt Out	Efficiency Maine Triennial Plan H.P. 1128--L.D. 1559	3
Colorado (2007) Tailored Targets Electric and Nat. Gas IOUs (~57%)	Electric: Black Hills follows PSCo savings targets of 0.8% of sales in 2011, increasing to 1.35% of sales in 2015 and 1.66% of sales in 2019. Natural Gas: Savings targets commensurate with spending targets (at least 0.5% of prior year's revenue).	1.5%	Binding	Colorado Revised Statutes 40-3.2-101, et seq. ; Docket No. 08A-518E Dec. R09-0542 Docket No. 12A-100E Dec. R12-0900; Docket 10A-554EG	3
Indiana (2009) EERS Electric Jurisdictional utilities (IOUs and Muni's) (85%)	0.3% annual savings in 2010, increasing to 1.1% in 2014, and leveling at 2% in 2019.	1.5%	Binding	Cause No. 42693, Phase II Order	3

[48] The 15% per capita electricity use reduction translates to around 17% cumulative savings over 2007 retail sales. Only the portion of those savings required by utilities is used to calculate annual savings targets.

State (Year Enacted) Policy Type Sector(s) Covered Applicability (% sales affected)	Description	Approx. Annual Electric Savings Target (2013+)[47]	Stringency	Reference	Score
Minnesota (2007) EERS Electric and Nat. Gas Statewide Goal (100%)	Electric: 1.5% annual savings in 2010 and thereafter. Natural Gas: 0.75% annual savings from 2010-2012; 1% annual savings in 2013 and thereafter.	1.5%	Binding	Minn. Stat. § 216B.241	3
Connecticut (2011 & 2013) EERS Electric and Nat. Gas Statewide Goal (100%)	Electric: Targets based on all cost-effective efficiency requirement, equivalent to annual savings of about 1.4% through 2015. Natural Gas: Average annual savings targets of ~60 MMTherms through 2015.	1.4%	Binding	Public Act 13-298 Public Act 11-80 2013 Conservation & Load Management Plan	2.5
Iowa (2009) Tailored Targets Electric and Nat. Gas Statewide Goal (100%)	Electric: Varies by utility from 1-1.5% annually by 2013. Natural Gas: Varies by utility from 0.74-1.2% annually by 2013. The next round of targets are under discussion, to be finalized by the end of 2013.	1.4%	Binding	Senate Bill 2386 Iowa Code § 476	2.5
Oregon (2010) Tailored Targets Electric and Nat. Gas Energy Trust of Oregon (100%)	Electric: Targets are equivalent to 0.8% of 2009 electric sales in 2010, ramping up to 1% in 2013 and 2014. Natural Gas: 0.2% of sales in 2010 ramping up to 0.4% in 2014.	1.0%	Binding	Energy Trust of Oregon 2009 Strategic Plan	2.5
Hawaii (2004 & 2009) RPS-EERS Electric Statewide Goal (100%)	Utilities must use "renewable electrical energy" to meet 40% of net electricity sales by 2030. Savings from energy efficiency programs may count towards meeting up to 50% of the standard through 2014. Beginning in 2015, electrical energy savings will count towards an Energy Efficiency Portfolio Standard (EEPS), which sets a goal to reduce electricity consumption by 4,300 GWh by 2030 (equal to ~30% of forecast electricity sales, or 1.4% annual savings).	1.4%	Binding	HRS §269-91, 92, 96 HI PUC Order, Docket 2010-0037	2
Washington (2006) EERS Electric IOUs, Co-ops, Muni's (~81%)	Biennial and Ten-Year Goals vary by utility. Law requires savings targets to be based on the Northwest Power Plan, which estimates potential annual savings of about 1.5% through 2030 for Washington utilities. All cost-effective conservation requirement.	1.4%	Binding	Ballot Initiative I-937 WAC 480-109 WAC 194-37	2
Ohio (2008) EERS Electric IOUs (~89%)	22% by 2025 (0.3% annual savings in 2009, ramping up to 1% in 2014 and 2% in 2019). Peak demand reduction targets of 1% in 2009 and an additional 0.75% each year thereafter until 2018.	1.2%	Binding	ORC 4928.66 et seq. S.B. 221	2

State (Year Enacted) Policy Type Sector(s) Covered Applicability (% sales affected)	Description	Approx. Annual Electric Savings Target (2013+)[47]	Stringency	Reference	Score
Arkansas (2010) EERS Electric and Nat. Gas IOUs (~53%)	Electric: Annual reduction of 0.75% of total electric kWh sales in 2014 (up from 0.25% in 2011, 0.50% in 2012, and 0.75% in 2013). Natural Gas: Annual reduction of 0.40% in 2014. The next round of targets are under discussion by PSC staff and stakeholders.	1.1%	Binding	Order No. 17, Docket No. 08-144-U; Order No. 15, Docket No. 08-137-U Order No. 1, Docket No. 13-002-U	2
New Mexico (2008 & 2013) EERS Electric IOUs (68%)	5% reduction from 2005 total retail electricity sales by 2014, and an 8% reduction by 2020.	1.0%	Binding	N.M. Stat. § 62-17-1 et seq.	2
Michigan (2008) EERS Electric and Nat. Gas Statewide Goal (100%)	Electric: 0.3% annual savings in 2009, ramping up to 1% in 2012 and continuing through 2015. Natural Gas: 0.10% annual savings in 2009, ramping up to 0.75% in 2012 and continuing through 2015.	1.0%	Cost Cap	M.G.L. ch. 25, § 21; Act 295 of 2008	2
California (2004 & 2009) EERS Electric and Nat. Gas IOUs (~78%)	Electric: ~0.85% annual savings through 2020. Demand reduction of 4,541 MW through 2020. Natural Gas: 619 gross MMTh between 2012 and 2020. Utilities must pursue all cost-effective efficiency resources.	0.9%	Binding	CPUC Decision 04-09-060; CPUC Decision 08-07-047; CPUC Decision 09-09-047	1.5
Wisconsin (2011) Tailored Targets Electric and Nat. Gas Focus on Energy (100%)	Electric: 0.66% of sales in 2011-2014. Natural Gas: 0.5% of sales in 2011-2014. Energy efficiency measures may not exceed an established cost-cap.	0.7%	Cost Cap	Order, Docket 5-GF-191	1
Pennsylvania (2004 & 2008) EERS Electric Utilities with over 100,000 customers (~93%)	3% cumulative savings from 2009 to 2013; ~2.3% cumulative savings from 2014-2016. Cumulative peak demand reduction of 4.5% by 2013 compared to 2007. Inclusion of peak demand targets for next round has not yet been finalized. Energy efficiency measures may not exceed an established cost-cap.	0.8%	Cost Cap	66 Pa C.S. § 2806.1; PUC Order Docket No. M-2008-2069887; PUC Implementation Order Docket M-2012-2289411	0.5
North Carolina (2007) RPS-EERS Electric Statewide Goal (100%)	Renewable Energy and Energy Efficiency Portfolio Standard (REPS) requires renewable generation and/or energy savings of 6% by 2015, 10% by 2018, and 12.5% by 2021 and thereafter. Energy efficiency is capped at 25% of target, increasing to 40% in 2021 and thereafter.	0.5%	Opt Out	N.C. Gen. Stat. § 62-133.8 04, NCAC 11 R08-64, et seq.	0.5

State (Year Enacted) Policy Type Sector(s) Covered Applicability (% sales affected)	Description	Approx. Annual Electric Savings Target (2013+)[47]	Stringency	Reference	Score
Nevada (2005, 2009 & 2013) RPS-EERS Electric IOUs (~88%)	20% of retail electricity sales to be met by renewables and energy efficiency by 2015, and 25% by 2025. Energy efficiency may meet a quarter of the standard through 2013, but allowances phase out by 2020.	0.2%	Binding	NRS 704.7801 et seq.	0
Texas (1999 & 2007) EERS Electric IOUs (~73%)	20% Incremental Load Growth in 2011 (equivalent to ~0.10% annual savings); 25% in 2012, 30% in 2013 onward. Peak demand reduction targets of 0.4% compared to previous year. Energy efficiency measures may not exceed an established cost cap.	0.1%	Cost Cap, Opt Out	Senate Bill 7; House Bill 3693; Substantive Rule § 25.181 Senate Bill 1125	0

Appendix C: State Transit Funding

State	FY 2011 Funding ($million)	2011 Population Figures	Per Capita Transit Expenditure ($/person)
Alaska	169.3	723,860	233.84
New York	4,246.1	19,501,616	217.73
Massachusetts	1,206.9	6,607,003	182.68
Maryland	1,049.5	5,839,572	179.72
Connecticut	411.8	3,586,717	114.82
District of Columbia	387.4	619,020	110.67
Illinois	1,323.0	12,859,752	102.88
Delaware	83.9	908,137	92.43
New Jersey	773.4	8,834,773	87.54
Pennsylvania	1,055.8	12,743,948	82.85
Rhode Island	56.9	1,050,646	54.20
Minnesota	263.3	5,347,299	49.23
California	1,731.3	37,683,933	45.94
Oregon	132.3	3,868,229	34.20
Virginia	201.4	8,104,384	24.85
Michigan	215.0	9,876,801	21.77
Wisconsin	115.7	5,709,843	20.27
Washington	80.0	6,823,267	11.73
Vermont	6.8	626,592	10.92
Florida	174.9	19,082,262	9.17
Indiana	55.2	6,516,353	8.47
North Carolina	74.9	9,651,103	7.77
Tennessee	44.3	6,399,787	6.93
New Mexico	11.2	2,078,674	5.38
Wyoming	2.6	567,356	4.61
North Dakota	3.2	684,740	4.60
Iowa	12.7	3,064,097	4.16
Colorado	12.4	5,116,302	2.41
Kansas	6.0	2,870,386	2.09
Nebraska	2.9	1,842,234	1.57
Oklahoma	5.8	3,784,163	1.52

State	FY 2011 Funding ($million)	2011 Population Figures	Per Capita Transit Expenditure ($/person)
West Virginia	2.8	1,854,908	1.50
South Carolina	6.0	4,673,348	1.28
Texas	28.7	25,631,778	1.12
Arkansas	3.3	2,938,582	1.11
Louisiana	5.0	4,574,766	1.08
South Dakota	0.8	823,593	0.93
Ohio	10.6	11,541,007	0.92
Mississippi	1.6	2,977,457	0.54
Missouri	3.0	6,008,984	0.50
Maine	0.5	1,328,544	0.40
Georgia	3.7	9,812,460	0.38
Kentucky	1.5	4,366,814	0.34
Montana	0.3	997,667	0.32
New Hampshire	0.4	1,317,807	0.32
Nevada	0.7	2,720,028	0.25
Idaho	0.3	1,583,744	0.20
Alabama	0.0	4,803,689	0.00
Arizona	0.0	6,467,315	0.00
Hawaii	0.0	1,378,129	0.00
Utah	0.0	2,814,347	0.00

Appendix D: State Transit Legislation

State	Description of Transit Legislation	Source
California	California's Transportation Development Act provides two sources of funding for public transit: the Location Transportation Fund and the State Transit Assistance Fund. Monies are allocated to each county based on population, taxable sales, and transit performance and are used for the development and maintenance of transit infrastructure.	http://www.dot.ca.gov/hq/MassTrans/State-TDA.html
Colorado	Colorado adopted the FASTER legislation in 2009, which created a State Transit and Rail fund that accumulates $5 million annually. The legislation also allocated $10 million per year from the Highway Users Tax Fund to the maintenance and creation of transit facilities. Colorado subsequently passed SB 48 in 2013, which allowed for the entire local share of the Highway Users Trust Fund (derived from state gas tax and registration fees) to be used for public transit and bicycle or pedestrian investments.	http://www.leg.state.co.us/clics/clics2009a/csl.nsf/billcontainers/636E40D6A83E4DE987257537001F8AD6/$FILE/108_enr.pdf http://www.leg.state.co.us/CLICS/CLICS2013A/csl.nsf/fsbillcont3/9D4690717C1FF9DC87257AEE00572392?Open&file=048_enr.pdf
Florida	House Bill 1271 allows municipalities in Florida with a regional transportation system to levy a tax, subject to voter approval, that can be used as a funding stream for transit development and maintenance.	http://www.myfloridahouse.gov/sections/Bills/billsdetail.aspx?BillId=44036
Georgia	The Transportation Investment Act, enacted in 2010, allows municipalities to pass a sales tax for the express purpose of financing transit development and expansion.	http://www.dot.state.ga.us/localgovernment/FundingPrograms/transreferendum/Documents/Legislation/HB277-BreakdownbySection.pdf
Illinois	House Bill 289 allocates $2.5 billion for the creation and maintenance of mass transit facilities from the issuance of state bonds.	http://legiscan.com/gaits/text/70761
Iowa	The Iowa State Transit Assistance Program devotes 4% of the fees for new registration collected on sales of motor vehicle and accessory equipment to support public transportation.	http://www.iowadot.gov/transit/funding.html
Kansas	The Transportation Works for Kansas legislation was adopted in 2010 and provides financing for a multimodal development program in communities with immediate transportation needs.	http://votesmart.org/bill/11412/30514/transportation-works-for-kansas-program%20%28T-Works%20for%20Kansas%20Program%29
Massachusetts	Section 35T of Massachusetts general law establishes the Massachusetts Bay Transportation Authority State and Local Contribution Fund. This account is funded by revenues from a 1% sales tax.	https://malegislature.gov/Laws/GeneralLaws/PartI/TitleII/Chapter10/Section35t
Michigan	The Michigan Comprehensive Transportation Fund funnels both vehicle registration revenues and auto-related sales tax revenues towards public transportation and targeted transit demand management programs.	http://www.house.mi.gov/hfa/PDFs/CTF%20and%20Local%20Bus%20Operating%20Apr11.pdf

State	Description of Transit Legislation	Source
Minnesota	House File 2700, adopted in 2010, is an omnibus bonding and capital improvement bill which provides $43.5 million for transit maintenance and construction. The bill also prioritized bonding authorization so that appropriations for transit construction for fiscal years 2011 and 2012 would amount to $200 million.	http://wdoc.house.leg.state.mn.us/leg/LS86/CEH2700.1.pdf
New York	In 2010 New York adopted Assembly Bill 8180, which increases certain registration and renewal fees to fund public transit. It also created the Metropolitan Transit Authority financial assistance fund to support subway, bus, and rail.	http://www.ncsl.org/issues-research/transport/major-state-transportation-legislation-2010.aspx#N
North Carolina	In 2009 North Carolina passed House Bill 148, which calls for the establishment of a congestion relief and intermodal transportation fund.	http://www.ncleg.net/sessions/2009/bills/house/pdf/h148v2.pdf
Pennsylvania	Act 44 of House Bill 1590, passed in 2007, allows counties to impose a sales tax on liquor or an excise tax on rental vehicles to fund the development of their transit systems.	http://www.legis.state.pa.us/WU01/LI/LI/US/HTM/2007/0/0044..HTM
Tennessee	Tennessee Senate Bill 1471, passed in 2009, calls for the creation of a Regional Transportation Authority in major municipalities. It allows these authorities to set up dedicated funding streams for mass transit either by law or through voter referendum.	http://state.tn.us/sos/acts/106/pub/pc0362.pdf
Virginia	House Bill 2313, adopted this year, creates the Commonwealth Mass Transit Fund which will receive approximately 15% of revenues collected from the implementation of a 1.5% sales and use tax for transportation expenditures.	http://lis.virginia.gov/cgi-bin/legp604.exe?131+ful+CHAP0766
Washington	In 2012, Washington adopted House Bill 2660, which created an account to provide grants to public transit agencies to preserve transit service.	http://apps.leg.wa.gov/documents/billdocs/2011-12/Pdf/Bills/Session%20Laws/House/2660.SL.pdf
West Virginia	On April 13, 2013, West Virginia Legislature passed Senate Bill No. 103. This bill is known as the WV Commuter Rail Access Act. It establishes a special fund in the State Treasury to pay track access fees accrued by commuter rail services operating within West Virginia borders. The funds have the ability to rollover from year-to-year and are administered by the West Virginia State Rail Authority.	http://www.legis.state.wv.us/Bill_Status/bills_text.cfm?billdoc=SB103%20SUB1%20ENR.htm&yr=2013&sesstype=RS&i=103

Appendix E: Summary of State Building Code Stringency

State	Summary of State Building Code Stringency	Score
Alabama	Effective October 1, 2012, the Alabama Energy and Residential Code (AERC) will become mandatory statewide, for the first time in the state's history. The residential provisions of the AERC reference Chapter 11 of the 2009 IRC with Alabama amendments, which adopt the insulation and fenestration requirements from the 2009 IECC. The commercial provisions of the AERC reference the 2009 IECC with Alabama amendments while referencing ASHRAE Standard 90.1-2007 as an alternative compliance path. Local jurisdictions may adopt more stringent codes.	3
Alaska	Alaska's residential code is the state-developed Building Energy Efficiency Standard (BEES), which, effective July 1, 2013, is based on the 2012 IECC and ASHRAE Standard 62.2-2012 Ventilation and Acceptable Indoor Air Quality in Low-Rise Residential Buildings, with Alaska-specific amendments. BEES is mandatory for state-financed residential construction projects, which covers roughly 25% of housing starts in the state (those that qualify for state financial assistance). Alaska has no statewide commercial building code, but all public facilities must comply with the thermal and lighting energy standards adopted by the Alaska Department of Transportation and Public Facilities mandated by AS44.42020 (a) (14).	0.5
Arizona	Arizona is a home-rule state, meaning that codes are adopted and enforced on a local rather than state level. For commercial structures, all state-funded buildings constructed after February 11, 2005 must achieve LEED Silver certification and meet the energy standards of ASHRAE 90.1-2004 as mandated by Executive Order 2005-05. Based on recent jurisdictional adoptions, almost 70% of Arizona's population is covered by the 2009 IECC or better.	2.5
Arkansas	The Arkansas Energy Code for New Building Construction is mandatory statewide for both residential and commercial buildings. The residential energy code is based on the 2003 IECC and includes state-specific amendments. As of January 1, 2013, Arkansas' commercial energy code references ASHRAE Standard 90.1-2007 with Chapter 5 of the 2009 IECC as an alternative compliance path. Newly constructed or remodeled public buildings must comply with ASHRAE 90.1-2007.	2.5
California	California's Title 24, Part 6, authorized by the Warren-Alquist Act of 1974, establishes prescriptive and mandatory guidelines for construction methods, materials, equipment, and controls that are used in residential and nonresidential newly constructed buildings and additions and alterations to existing buildings. California's energy code is considered to be the most aggressive and best enforced energy code in the United States, and has been a powerful vehicle for advancing energy-efficiency standards for building equipment. Many specifications are performance-based, offering flexibility for designers. The code also stands out because it includes field verification requirements for certain measures and reports high compliance rates overall. The most recently adopted 2013 code, effective January 1, 2014, is mandatory statewide and exceeds 2012 IECC standards for residential buildings and meets or exceeds ASHRAE/IESNA 90.1-2010 for commercial buildings.	5
Colorado	Colorado is a home rule state with a voluntary building code for both residential and commercial construction, with the 2003 IECC as a mandatory minimum for jurisdictions that have adopted a code previously. Jurisdictions that have not adopted or enforced codes are exempt from the 2003 IECC requirement, although the 2012 IECC is mandatory for all factory-built and multi-family structures—commercial and residential—in areas that do not adopt or enforce buildings codes.	3
Connecticut	In 2009, the state of Connecticut adopted the target code, IECC 2009 and ASHRAE 90.1 2007, pursuant to PA 09-192, with the new code going into effect on	4

State	Summary of State Building Code Stringency	Score
	October 7, 2011. The law also required certain standards that are stricter than the target code. The bill requires the incorporation of the 2012 IECC within 18 months of its publication. Connecticut has also enacted several above-code requirements for certain buildings: The 2013 Comprehensive Energy Strategy (CES) for Connecticut published in February 2013 recommends adopting more stringent building codes and appliance standards. The CES states that in the summer of 2013, Connecticut must adopt and enforce the 2012 IECC for residential buildings and the 2010 American Society of Heating, Refrigerating and Air Conditioning Engineers (ASHRAE) Standard 90.1 for commercial buildings, as required by statute (Conn Gen. Stat. 29-256a). Effective July 1, 2010, the State Building Inspector and the Codes and Standards Committee, in consultation with the Commissioner of Public Safety, shall revise the State Building Code to include provisions requiring certain buildings of or over a specified minimum size, that qualify as a new construction or a major alteration of a residential or nonresidential building, to meet or exceed optimum cost-effective building construction standards concerning the thermal envelope or mechanical systems, including, but not limited to, indoor air quality and water conservation, and the lighting and electrical systems of the building. Such provisions must reference nationally accepted green building rating systems, including, but not limited to, the Leadership in Energy and Environmental Design (LEED) rating system, the Green Globes USA design program, as established by the Green Building Initiative, the National Green Building Standard, as established by the National Association of Home Builders, or an equivalent rating system approved by the State Building Inspector and the Codes and Standards Committee. Such requirements must include a method for demonstrating compliance at the time of application for a certificate of occupancy, including, but not limited to, private third-party certification or verification of compliance with the relevant portions of such rating systems, including, but not limited to, the energy and environmental portions.	
Delaware	Through the passage of SB 59, which became effective July 1, 2010, Delaware's residential and commercial codes were updated to follow the 2009 IECC and ASHRAE 90.1-2007, respectively. Both residential and commercial codes are reviewed triennially for potential updates to the most recent versions of the IECC and ASHRAE Standard 90.1.	3
District of Columbia	Washington D.C.'s energy codes are mandatory across the District. For residential buildings, builders must comply with the 2008 D.C. Construction Codes, which is based on the "30% Solution" and is more stringent than the 2009 IECC. For commercial buildings, builders must again comply with the 2008 D.C. Construction Codes, which is based on ASHRAE 90.1-2007. On December 16, 2011, the District of Columbia's Construction Codes Coordinating Board (CCCB) voted in favor of adopting the 2012 IECC. Implementation is expected in late 2013 pending administrative review and legislative processes to officially enact the code update.	3
Florida	The first printing of the 2010 Florida Building Codes, including the now-separate 2010 Florida Building Code-Energy Conservation, became effective March 15, 2012. Adopted by the Florida Building Commission (FBC) in 2011, the state-developed code references the 2009 IECC and ASHRAE Standard 90.1-2007 as base documents, with significant Florida-specific amendments throughout. The pending state-developed 2014 Florida Energy Efficiency Code for Building Construction is based upon the 2012 IECC and ASHRAE 90.1-2010, with significant Florida-specific amendments to maintain per statute efficiencies already in the Florida code. The FBC certified in letters to the U.S. DOE that the new code meets or exceeds those standards. This update is now scheduled to become effective December 31, 2014, as part of the "Florida Building Code, 5th Edition (2014)."	3

State	Summary of State Building Code Stringency	Score
Georgia	On January 1, 2011, the 2011 Georgia State Minimum Standard Energy Code became effective statewide as approved by the Georgia Department of Community Affairs on November 3, 2010. The state code is based on the 2009 IECC with state-specific strengthening amendments and is mandatory statewide. The commercial codes also reference ASHRAE 90.1-2007. The state also adopted the 2011 Georgia State Minimum Residential Green Building Standard, based on the 2008 National Green Building Standard (NGBS) with 2011 Georgia Amendments, as an optional code. It is available for local government adoption and enforcement.	3
Hawaii	On February 14, 2012, the Hawaii Building Code Council approved the IECC 2009 with Hawaii amendments as Hawaii's updated building energy code. In April, 2012, the Maui County Building Division introduced legislation to adopt IECC 2009 as amended. Honolulu County plans to introduce legislation to adopt in May, 2012. The Energy Committee of the Hawaii Building Code Council has commenced work on amending the IECC 2012.	3
Idaho	Effective January 1, 2011, the 2009 IECC is mandatory statewide for residential and commercial construction, the latter with reference to ASHRAE 90.1-2007.	3
Illinois	On August 17, 2012, Senate Bill 3724 was signed by Governor Pat Quinn, which amended the effective date of the adoption of the 2012 IECC to January 1, 2013. The Illinois Energy Conservation Code is mandatory statewide and applies to both residential and commercial buildings, the latter with reference to ASHRAE Standard 90.1-2010.	4
Indiana	The Indiana Energy Conservation Code is state-developed and mandatory statewide. For residential buildings, the 2011 amendments update the 2005 Indiana Residential Code to reference Chapter 11 of the 2009 IRC, with the amendments meeting the stringency of Chapter 4 of the 2009 IECC, effective as of April 5, 2012. For commercial buildings (commercial and residential buildings with three or more dwelling units) the code references ASHRAE standard 90.1-2007 as of May 6, 2010. Executive Order 08-14, signed by Governor Charlie Daniels on June 28, 2008, requires all new state buildings to earn LEED silver certification.	3
Iowa	The Iowa State Energy code is mandatory statewide for residential and commercial buildings, although jurisdictions are free to adopt stricter codes. Residential buildings must comply with the 2009 IECC, while the commercial buildings must also comply with the 2009 IECC, with reference to ASHRAE 90.1–2007. The Iowa Department of Public Safety and the Iowa State Energy Office are currently convening multiple stakeholder meetings to seek feedback on the 2012 IECC, with a goal of adoption in January 2014.	4
Kansas	Kansas is a home-rule state and thus has no statewide residential building code, though realtors and homebuilders are required to fill out an energy-efficiency disclosure form and provide it to potential buyers. In April 2007, the 2006 IECC became the applicable standard for new commercial and industrial structures. Jurisdictions in the state are not required to adopt the code. Many jurisdictions have adopted the 2009 or 2012 IECC. Based on information obtained in a 2013 survey of local jurisdictions and 2011 U.S. Census permit data, it is estimated the almost 60% of residential construction in Kansas is covered by the two most-recent iterations of the IECC. The Kansas Corporation Commission's Energy Division will continue to survey local jurisdictions—cities and counties that, taken together, account for over 90% of the state's residential construction activity—and publish the findings annually.	2.5
Kentucky	As of October 1, 2012, the 2007 Kentucky Residential Code (KRC) mandates residential buildings must comply with the 2009 IECC or IRC with state	3

State	Summary of State Building Code Stringency	Score
	amendments. The 2007 Kentucky Building Code (KBC) states that commercial construction must comply with the 2009 IECC or the 2009 IBC with state amendments.	
Louisiana	Residential buildings must meet the 2009 IRC with reference to the 2009 IECC. Effective July 20, 2011, ASHRAE Standard 90.1-2007 applies to all private commercial buildings built or remodeled as well as state-owned construction. Low-rise multi-family residential construction must comply with the 2009 IECC, while multi-family residential construction over 3 stories must comply with ASHRAE 90.1-2007.	3
Maine	The Maine Uniform Building and Energy Code (MUBEC) was established legislatively in April 2008 through P.L. 699. On June 1, 2010, the 2009 IECC and ASHRAE 90.1-2007 became mandatory for residential, commercial, and public buildings statewide, though enforcement varies by population. In 2011, P.L. 408 changed mandatory compliance requirements for the Maine Uniform Building and Energy Code (MUBEC) to municipalities with populations over 4,000. Therefore, towns with a population less than 4,000 are not required to enforce the code. Towns with a population of 4,000 that had a building code as of August 1, 2008 were required to begin enforcing the new codes December 1, 2010. Towns with a population of 4,000 but did not have a building code as of August 1, 2008, will be required to begin enforcing the new codes December 1, 2012. This change means that only 89 of Maine's 533 municipalities (based on 2010 census data) are required to comply with energy efficiency codes, which means the requirement applies to approximately 60% of the state's population. Smaller municipalities may adopt the uniform code, but are not required to. In 2013, LD 977, which would return to the 2,000 population threshold, was introduced and is making its way through the legislative process.	2
Maryland	The 2012 Maryland Building Performance Standards are mandatory statewide and reference the 2012 ICC Codes, including the 2012 IECC, for all new and renovated residential and commercial buildings. § 12-503 of the Maryland Code requires the Department of Housing and Community Development to adopt the most recent version of the IECC twelve (12) months after it is issued and may adopt energy conservation requirements that are more stringent than the codes, but may not adopt energy conservation requirements that are less stringent. Maryland is a home rule state, so each of its 57 local jurisdictions may modify these codes to suit local conditions.	4
Massachusetts	The Massachusetts Board of Building Regulations and Standards (BBRS) is in the process of adopting the 2012 IECC (expected summer 2013) with state-specific amendments for both residential and commercial buildings, as the updated statewide baseline energy code. This update is supported by the Massachusetts Green Communities Act of 2009's requirement to adopt each new IECC edition within one year of its publication. Massachusetts also has a "stretch" energy code option for local jurisdictions. Where adopted, the stretch energy code replaces the baseline IECC code as a mandatory minimum energy code, which focuses on energy performance requiring HERS rating for residential homes and ASHRAE Appendix G/LEED modeling for large commercial buildings. The current stretch energy code is 15-20% more stringent than the 2009 IECC and similar in stringency to the 2012 IECC. To date (May 30, 2013) the stretch energy code has been adopted by 131 out of 351 municipalities in Massachusetts, representing about 50% of the state population.	4
Michigan	The 2009 Michigan Uniform Energy Code became effective March 9, 2011 and is mandatory statewide for residential and commercial buildings. Residential buildings must comply with the 2009 IECC, with state-specific amendments.	3

State	Summary of State Building Code Stringency	Score
	Commercial buildings are required to comply with ASHRAE 90.1-2007.	
Minnesota	Both Minnesota's residential and commercial building codes, the 2007 Minnesota State Building Code, are mandatory statewide. The residential code (Chapter 1322) is based on Chapter 11 of the 2006 IRC with amendments. The commercial code (Chapter 1323) is based on ASHRAE 90.1-2004 with amendments. The 2007 Minnesota State Building Code became effective June 1, 2009.	2
Mississippi	Mississippi is a home-rule state, although its commercial energy codes were recently updated and are now mandatory statewide. Mississippi's residential code is voluntary and is based on ASHRAE 90–1975 and the prior 92 MEC. In the 2013 Regular Session, the Mississippi Legislature passed and Governor Bryant signed laws setting the mandatory energy code standard for commercial and state-owned buildings as ASHRAE 90.1-2010, which take effect on July 1, 2013. Based on a June 2011 Energy Codes Economic Analysis conducted by BCAP and Southface, as well as additional data collected by MDA, approximately 60% (1.75 million out of a total 2.9 million residents) of the State's population reside in cities or counties with building codes equivalent to 2003 IBC or higher, and the average code standard for these local jurisdictions is 2006 ICC.	2
Missouri	Missouri is a home-rule state and thus has no mandatory statewide codes. As of July 1, 2012, state-owned commercial buildings must comply with the 2012 IECC. Executive Order 09-18, issued in 2009, requires that "all new state construction, buildings being constructed for lease by the state, and significant renovations and replacement of energy-using equipment shall be at least as stringent as the most recent energy efficiency standards of the IECC." In response to the Executive Order, the Office of Administration, Division of Facilities Management, Design and Construction (OA-FMDC) developed and adopted a State Building Energy Efficiency Design Standard (BEEDS). State-owned residential buildings must comply with latest edition of the MEC or the ASHRAE 90.2-1993 (single-family and multifamily buildings). State-owned residential buildings must comply with latest edition of the MEC or the ASHRAE 90.2-1993 (single-family and multifamily buildings). Missouri surveyed local jurisdictions/municipalities to compile a database of building code adoption in the state/s 114 counties and 990+ cities, which was completed in June 2012. It found that numerous large jurisdictions have adopted the 2009 IECC or equivalent codes, such as St. Louis, while Kansas City has adopted the 2012 IECC. Approximately 30% of the state's population is covered by the 2009 IECC or equivalent codes.	2
Montana	Montana's residential and commercial building codes, codified in ARM Title 24, Chapter 301.160, are mandatory statewide. Montana's residential code requires compliance with the 2009 IECC, with strengthening amendments. The commercial building code requires compliance with the 2009 IECC with reference to ASHRAE 90.1-2007. The Montana Department of Labor and Industry began the process of adopting the 2012 IECC in July 2013.	3
Nebraska	Nebraska is a home-rule state, but its residential and commercial energy codes, referred to as the Nebraska Energy Code (NEC), are mandatory statewide. Residential buildings are required to comply with the 2009 IECC. Commercial buildings must also comply with the 2009 IECC with reference to ASHRAE 90.1–2007. Local jurisdictions can exceed the NEC; the three metro counties are at various preliminary stages of adopting the 2012 IECC, however none have yet adopted it officially. Nonetheless, 100% of new homes fall under the 2009 IECC as the NEC is the minimum standard. In May the Nebraska Association of Code Officials submitted legislation to adopt the 2012 IECC and has produced several documents in support of the new codes. It is unclear if the Legislature will move to adopt.	3

State	Summary of State Building Code Stringency	Score
Nevada	The 2012 Nevada Energy Code became effective July 1, 2012 and is mandatory statewide. The residential codes are based on the 2009 IECC. The commercial codes are based on the 2009 IECC, with ASHRAE Standard 90.1-2007 as an acceptable compliance path through Chapter 5 of the 2009 IECC. Local jurisdictions are not allowed to adopt less-efficient energy codes. However, the city of Las Vegas rescinded all energy code provisions for commercial buildings constructed prior to 2011, when the 2009 IECC was originally adopted. New buildings must comply with the code, but all existing buildings that were constructed within this timeframe are not subject to the energy code provisions or inspections.	3
New Hampshire	Effective April 1, 2010, the New Hampshire State Building Code for residential and commercial buildings is based on the 2009 IECC, with state-specific amendments. The commercial code is also based on the 2009 IECC with references to ASHRAE 90.1-2007. Both codes are mandatory statewide.	3
New Jersey	The 2009 New Jersey Uniform Construction Code for residential and commercial buildings is mandatory statewide. The residential codes are based on the 2009 IECC with state-specific amendments. The commercial codes are based on ASHRAE 90.1-2007 with state-specific amendments.	3
New Mexico	The 2009 New Mexico Energy Conservation Code (NMECC) is based on the 2009 IECC with state-specific amendments for both residential and commercial building codes. ASHRAE Standard 90.1-2007 is an acceptable compliance path through Chapter 5 of the 2009 IECC. All areas of the state are covered by local building jurisdictions and must meet or exceed the state minimum code. The City of Santa Fe and Town of Taos have adopted Green Building codes that go beyond the state code and require LEED Silver at a minimum. Builders can also use the NM 2009 Energy Conservation Code Residential Applications Manual to comply when building a passive solar or high mass home.	3
New York	The 2010 Energy Conservation Construction Code of New York (ECCCNYS 2010) took effect on December 28, 2010, and is mandatory statewide for both residential and commercial buildings. The ECCCNYS 2010 is based on the 2009 IECC with state-specific amendments and also permits commercial construction to demonstrate compliance using ANSI/ASHRAE/IES Standard 90.1-2007 (Standard 90.1). In addition, several municipalities in New York State, including New York City, have adopted more stringent requirements as part of local code, such as ENERGY STAR, minimum HERS scores, benchmarking and early adoption of the 2012 IECC. New York State will update the ECCCNYS based on the 2012 IECC and Standard 90.1-2010 in late 2013 (commercial provisions) and mid-2014 (residential provisions).	4
North Carolina	The 2012 North Carolina Energy Conservation Code (NCECC) is mandatory statewide for both residential and commercial buildings. The residential and commercial codes are based on the 2009 IECC, both with substantial strengthening amendments, while the commercial code also references ASHRAE 90.1-2010.	3.5
North Dakota	North Dakota is a home rule state and has no statewide mandatory energy codes. The voluntary energy code is under the purview of the North Dakota State Building Code and the state Building Code Advisory Committee has the authority to make recommendations that could include energy standards future editions of the State Building Code. Chapters 11 and 13 of the 2009 IRC and IBC are contingent upon adoption by local jurisdictions. As of January 1, 2011, in chapter 11 of the IRC jurisdictions have the choice of adopting the IRC requirements or the 2009 IECC requirements. In chapter 13 of the IBC jurisdictions must meet the 2009 IECC	1

State	Summary of State Building Code Stringency	Score
	requirements.	
Ohio	Both Ohio's residential and commercial energy codes are mandatory statewide. Effective January 1, 2013, the residential code will reference the 2009 IECC. Residential home builders are also allowed to meet the requirements of sections 1101-1103 of Chapter 11 of the Residential Code of Ohio (based on Chapter 11 of the 2009 IRC) or by meeting the state code's new Prescriptive Energy Requirements (section 1104). In March 2011, the commercial code was amended to reference the 2009 IECC and ASHRAE 90.1-2007, and became effective November 1, 2011.	3
Oklahoma	Oklahoma has in place mandatory statewide building codes for residential and commercial buildings. Until recently, the state had been a home-rule state, but in June 2009, the Oklahoma Legislature passed a bill (SB 1182) creating the Oklahoma Uniform Building Code Commission (OUBCC) that reviewed and recommended building codes for residential and commercial construction for adoption (BCAP 2012). Beginning in October 2010, the Commission held several meetings discussing code change proposals. On March 31, 2011, the Commission formally recommended a residential code based on the 2009 IRC with Oklahoma amendments. The statute became effective July 15, 2011. In January 2012 the OUBCC submitted recommendations for approval by the Oklahoma legislature to adopt several of the 2009 ICC Code editions, including the 2009 IBC. The proposal stated that all references to the IECC within the codes adopted by the OUBCC shall refer to the 2006 IECC Commercial Code as adopted and modified by the State Fire Marshall until replaced with a code adopted by the OUBCC. The recommended code was approved by the Oklahoma Legislature and the Governor, effective November 1, 2012.	3
Oregon	The 2011 Oregon Residential Specialty Code (ORSC) and the 2010 Oregon Energy Efficiency Specialty Code (OEESC) are mandatory statewide. The ORSC provisions are more stringent than the 2009 IECC, as evaluated by the University of Idaho Integrated Design Lab. The OEESC commercial provisions are equivalent to or stronger than ASHRAE 90.1-2010.	4
Pennsylvania	Both Pennsylvania's residential and commercial energy codes are mandatory statewide. The residential buildings must comply with the 2009 IECC or 2009 IRC, Chapter 11. Residential buildings can also comply with Pennsylvania's Alternative Residential Energy Provisions (2009). Commercial buildings must also comply with the 2009 IECC, with reference to ASHRAE 90.1–2007. Legislation requires the Pennsylvania Department of Labor and Industry (DLI) to promulgate regulations adopting "a new triennial BOCA National Building Code, or its successor building code," and/or "a new triennial ICC International One and Two Family Dwelling Code" by December 31st of the year in which they are issued.	3
Rhode Island	Rhode Island will formally adopt, with Rhode Island amendments, the 2012 International Energy Conservation Code for both residential and commercial buildings on July 1, 2013, with enforcement beginning on October 1, 2013. The code is mandatory statewide. Rhode Island amendments include the continuation of the 2009 insulation table for residential building envelopes, and the stipulation that every new residential building must undergo performance testing, but does not need to achieve specific performance target levels in order to receive a certificate of occupancy.	4
South Carolina	On January 1, 2013, the 2013 South Carolina Energy Standard will become effective. The residential provisions will reference the 2009 IECC. The commercial provisions will reference the 2009 IECC as well, including that code's reference to ASHRAE Standard 90.1-2007 as an alternative compliance path. Local	3

State	Summary of State Building Code Stringency	Score
	jurisdictions may adopt more stringent energy codes.	
South Dakota	South Dakota has no mandatory statewide energy codes for residential or commercial construction. Codes are adopted by jurisdiction voluntarily. As of July 2011, state law established the 2009 IECC as a voluntary residential standard. Local jurisdictions also have authority to adopt various residential building and energy codes, including IRC and IECC. For commercial construction, ASHRAE 90.1 or IECC compliance is required by reference in the 2012 IBC, which is the mandatory statewide commercial building standard in state law unless local jurisdictions have either opted out of it or specifically adopted another code.	1
Tennessee	Tennessee is a home rule state, which gives jurisdictions the power to adopt and enforce their own codes. On June 2, 2011, the Tennessee State Fire Marshal's Office announced that it would begin the implementation and enforcement of adopted energy codes beginning July 1, 2011. These include ASHRAE Standard 90.1-2007 for all state buildings and the 2006 IECC for all other residential and commercial construction.	2
Texas	Texas' building codes are mandatory for both residential and commercial construction. Effective January 1, 2012, the Texas Building Energy Performance Standards were updated requiring single family homes to comply with the 2009 IRC. For all other residential, commercial, and industrial buildings, the 2009 IECC became effective April 1, 2011. State-owned buildings must meet ASHRAE 90.1-2007. For all buildings, jurisdictions can choose to adopt more stringent standards.	3
Utah	Utah's Uniform Building Code (UUBC) for residential and commercial building energy codes is mandatory statewide. Legislation was passed in 2013 increasing the stringency of the statewide codes. Residential construction must comply with the 2006 IECC, with references to provisions in the 2009 and 2012 IECC. Commercial construction must comply with the 2012 IECC.	3.5
Vermont	Vermont's 2011 Residential (RBES) and Commercial Building Energy Standards (CBES) are mandatory statewide. Effective October 1, 2011, the RBES references the 2009 IECC with several strengthening amendments from the 2012 IECC. Effective January 3, 2012, the CBES references the 2009 IECC and ASHRAE Standard 90.1-2007 with several strengthening amendments from the 2012 IECC. The state is required by statute to updates its codes every three years. The 2012 IECC and ASHRAE 90.1-2010 standards are expected to be adopted by August 2014.	4
Virginia	Virginia's Uniform Statewide Building Code (USBC) is mandatory statewide for residential and commercial buildings. As of March 1, 2011, the USBC was updated to reference the 2009 IECC and 2009 IRC. Residential buildings must comply with the 2009 IRC, while commercial buildings must comply with the 2009 IECC, with reference to ASHRAE 90.1-2007.	3
Washington	The 2012 Washington State Energy Code is a state-developed code that is mandatory statewide. The 2012 versions of the residential and commercial codes require compliance with the 2012 IECC, with the residential standard designed to generate an additional savings of 4%.	4.5
West Virginia	West Virginia's residential and commercial building codes are mandatory statewide; however, adoption by jurisdictions is voluntary. The 2013 West Virginia Legislature passed and Governor Earl Tomblin signed into law a bill updating the state's building energy code to follow the 2009 IECC for residential buildings and ASHRAE 90.1-2007 for commercial buildings. The West Virginia Fire Commission, which promulgates the state's building energy code, set the effective date for the	3

State	Summary of State Building Code Stringency	Score
	new commercial code as September 1, 2013, while the new residential code will become effective November 30, 2013.	
Wisconsin	Both Wisconsin's residential and commercial building energy codes are mandatory statewide. The state-developed residential code, referred to as Wisconsin Administrative Chapter SPS 322, Wisconsin Uniform Dwelling Code (UDC), is mandatory for one- and two-family dwellings and incorporates the 2006 IECC with state amendments. Local governments cannot modify the UDC, but all local governments are allowed to choose to enforce the UDC. The state-developed commercial code, referred to as SPS 363 of the Wisconsin Commercial Building Code, is based on the 2009 IECC. It can be modified by local governments when the modification is more stringent and the local government has enforcement authority granted by the state. SPS is in reference to administrative rules issued and administered by the Wisconsin Department of Safety & Professional Services.	2.5
Wyoming	Wyoming's residential and commercial building codes are voluntary. Known as the ICBO Uniform Building Code, they are based on the 1989 MEC and may be adopted and enforced by local jurisdictions. Some jurisdictions have adopted more stringent codes than the voluntary standard: the 8 most populated cities and counties in Wyoming have an energy code that meets or exceeds the IECC 2006 or equivalent. Teton County and Jackson are moving to the IECC 2012 within the next month or two; Cheyenne adopted the IECC 2009; Casper, Rock Springs, and Gillette adopted a modified IECC 2006.	1

Appendix F: Summary of Building Code Compliance Efforts

State	Compliance Activities	Score
Alabama		
Gap Analysis/Strategic Compliance Plan	In 2010, the Building Codes Assistance Project (BCAP) and the Southeast Energy Efficiency Alliance (SEEA) developed the Alabama Gap Analysis and an Implementation Action Kit.	
Baseline & Updated Compliance Studies	Alabama was chosen as one of four states to receive energy codes compliance evaluation and implementation assistance through Pacific Northwest National Laboratories (PNNL). PNNL developed an Alabama Energy Code Compliance Evaluation and Implementation Guide.	
Training/Outreach	The Alabama Department of Economic and Community Affairs (ADECA) has been actively providing energy codes training for many years. Recent efforts include specific training on the new Alabama Energy and Residential Code targeted toward all building industry professionals, Duct and Envelope Tightness training for HVAC contractors and Energy Codes Compliance Implementation and Evaluation Guide development and associated training provided by Pacific Northwest National Laboratories targeted specifically to code officials.	
Total		1
Alaska		
Gap Analysis/Strategic Compliance Plan	Alaska's Gap Analysis was completed November 2012.	
Stakeholder Advisory Group	BCAP chose Alaska to assist with the development of a Gap Analysis and a strategic plan, which were completed in late 2012. There is a stakeholder group working on statewide code issues, using these documents and others to adopt and set compliance for a statewide energy code.	
Training/Outreach	The Alaska Housing Finance Corporation actively has classes for contractors, building officials and others to train in compliance with the Alaska Building Energy Efficiency Standard.	
Total		1
Arizona		
Utility Involvement	Four of Arizona's utilities are actively involved in code-related efforts. Up to 1/3 credit of savings from building energy codes can be claimed by utilities to count towards annual savings goals. Utilities must demonstrate and evaluate the savings that they claim.	
Training/Outreach	The Governor's Office of Energy Policy co-sponsored workshop/training with Arizona utilities and the Arizona Building Officials in April 2012. Sessions on Residential and Commercial IECC Sections divided into introductory and advanced topics. The Arizona Building Officials also sponsors workshops/trainings on codes throughout the year.	
Total		1
Arkansas		
Gap Analysis/Strategic Compliance Plan	BCAP conducted a gap analysis in 2010.	
Baseline & Updated Compliance Studies	Not in the last two years. Major findings include: Out of a 100 homes, only half passed code requirements. Many were close to passing.	
Training/Outreach	Arkansas Energy Office has a grant with the USGBC-Arkansas Chapter to conduct commercial code classes around the state. AEO has a grant with the Arkansas Home Builder's Association to conduct residential code classes around the state.	
Total		1
California		

State	Compliance Activities	Score
Gap Analysis/Strategic Compliance Plan	The California Public Utilities Commission (CPUC) adopted the state's Long Term Energy Efficiency Strategic Plan ("Strategic Plan"), presenting a single roadmap to achieve maximum energy savings across all major groups and sectors in California. This comprehensive Strategic Plan for 2009 to 2020 represents the state's first integrated framework of goals and strategies for saving energy, covering government, utility, and private sector actions, and holds energy efficiency as the highest priority resource in meeting California's energy needs.	
Baseline & Updated Compliance Studies	The CPUC completed evaluations of building energy code compliance for the 2006-2008 program cycle in 2010, which can be found on the CALMAC website (http://www.calmac.org/). Evaluations of the 2010-2012 program cycle are currently underway and will be published either in late 2013 or early 2014.	
Utility Involvement	California codes are supported by IOU incentive and rebate programs. Beside utility incentive programs, they develop and deliver building energy code training to a variety of stakeholders including builders, building departments, trades people, engineers, and architects in support of increase compliance.	
Stakeholder Advisory Group	There are a number of stakeholder advisory groups including the Western HVAC Performance Alliance and the Compliance Improvement Advisory Group.	
Training/Outreach	The state has an Online Learning Center, which consists of a number of training videos that building officials, contractors and others can use to learn about California's energy standards as well as earn continuing education credits. Additionally, the Energy Commission is continuously working with stakeholders, including utilities, to develop meaningful and helpful training and educational material used by the building industry to properly implement the states building energy standards.	
Total		2
Colorado		
Gap Analysis/Strategic Compliance Plan	The state completed the Colorado Strategic Compliance Plan in November 2011 with the Colorado Energy Code Compliance Collaborative. The Plan looks at state and local policies to improve codes throughout the state, reach out to consumers as well as realtors, appraisers and lenders, and train the relevant parties. This plan incorporates the long term goals of a gap analysis and the specific near term goals of a strategic compliance plan.	
Baseline & Updated Compliance Studies	Colorado is currently preparing an evaluation of energy code compliance in the state. It will not be finished until June of this year, but it will provide relevant data to verify compliance. This compliance study is being prepared in conjunction with the Colorado Energy Code Compliance Collaborative, and it will be available on the Colorado Energy Office website once finalized.	
Utility Involvement	In conjunction with the Colorado Public Utilities Commission (CPUC), Xcel (the state's largest utility) has supported code compliance though the Building Energy Code Support Pilot. The pilot program is designed to work with local communities to adopt 2009 IECC standards or better and achieve compliance with them. The pilot program incorporates outreach and training, with results expected as early as July 2013. The results of the pilot will help the Public Utilities Commission (PUC) decide if a full program can be implemented in the next DSM programming.	
Stakeholder Advisory Group	The Colorado Energy Code Compliance Collaborative is heavily involved in building code compliance. The Collaborative's mission is to facilitate compliance with local energy codes and to coordinate energy code actions and policies throughout the state. The Collaborative was originally started and supported with funding from BCAP. Now, it is self-supporting and meets on a quarterly basis.	

State	Compliance Activities	Score
Training/Outreach	The state actively provides training for appraisers and realtors, two of the most crucial parties in the promotion of building efficiency. In order to respect the home rule status of its counties, Colorado uses market forces to incentivize energy efficiency. CEO has initiated the Appraisal Institute's Green Valuation Professional Program, and it recently hosted the Appraisal Institute Chair of Education to teach the first two green valuation courses. CEO will continue to offer education as part of the Memorandum of Understanding (MOU) signed with the Appraisal Institute—Colorado Chapter and the Colorado Coalition of Appraisers. The MOU promotes educational opportunities and the development of valuation studies to help move the market. CEO has also partnered with HUD, the EPA, and other 3rd parties to provide education on energy efficiency in the home buying process to real estate brokers throughout the state. In the next fiscal year, the Colorado Department of Local Affairs and CEO will provide code training to government officials, building department personnel, contractors and developers, and architects. The training will explain how to adopt, implement, and comply with codes.	
Total		1.5
Connecticut		
Gap Analysis/Strategic Compliance Plan	A proposal to conduct third party plan review and site studies has been approved by DEEP in its 2013-2015 C&LM draft decision. The Department of Construction Services and a committee that engages the Office of Construction Services, DEEP, the utility representatives, the Institute for Sustainable Energy and Northeast Energy Efficiency Partnerships (NEEP) is charged with the development and oversight of this effort. This process, once adopted, will be repeated annually through 2017 to determine additional training needs of local code officials, licensed inspectors, building designers and the trades, as well as the annual compliance rate for that year.	
Utility Involvement	Electric utilities provide building energy code compliance training and materials regularly across the state.	
Stakeholder Advisory Group	A committee that includes the Office of Construction Services, DEEP, the utility representatives, the Institute for Sustainable energy and Northeast Energy Efficiency Partnerships (NEEP) meets regularly to review progress on the Gap Analysis and the Strategic Compliance Plan. The State of Connecticut is cooperating with Northeast Energy Efficiency Partnerships (NEEP) to adopt and implement the 2009 IECC. NEEP has developed a set of resources and model policy to assist with implementation. NEEP is an active member of BCAP/OCEAN.	
Training/Outreach	Connecticut completed initial training programs for code compliance for both IECC 2009 and ASHRAE 2007. Throughout 2010 and 2011, OEMD provided all 169 local building officials and 450 licensed inspectors with three days (15 hours) of training on the target code offered through regional workshops with certified instructors from the International Code Council. Participants were also provided with code books and application workbooks reinforcing the residential, IECC 2009 and ASHRAE 90.1 2007 target codes.	
Total		1.5
Delaware		
Gap Analysis/Strategic Compliance Plan	In 2011, the Delaware Gap Analysis and the Delaware Strategic Compliance Plan were published and provided an overview of the strengths and weaknesses of Delaware's energy code adoption, implementation, and enforcement.	

State	Compliance Activities	Score
Baseline & Updated Compliance Studies	A Residential Building Code Baseline Study was conducted in 2012. With regard to actual building practices, the evaluation team found that Delaware residential builders, on average, currently build above minimum prescriptive 2009 IECC requirements by 6.6%; i.e., the average or typical home consumes about 6.6% less energy compared to the energy consumption of a home built to minimum code standards.	
Stakeholder Advisory Group	The Delaware Energy Code Coalition is an active stakeholder group.	
Training/Outreach	The Delaware Division of Energy & Climate is working with NEEP and BCAP to bring any available training to contractors and code officials. Currently 2012 IECC and ASHRAE 90.1-2010 Standard training are being planned for late summer 2013. The Energy Code Ambassadors training course will also conducted through BCAP and the Division in August 2013.	
Total		1.5
District of Columbia		
Training/Outreach	Training sessions for architects and engineers, as well as Department of Consumer and Regulatory Affairs (DCRA) inspectors are held where attendees learn about new and emerging technologies that can help buildings exceed the 2012 International Energy Conservation Code (IECC).	
Total		0.5
Florida		
Gap Analysis/Strategic Compliance Plan	The Florida Solar Energy Center (FSEC) completed a baseline compliance study in 2012, which was submitted to the Florida Department of Business and Professional Regulation (DBPR). The report presents data on energy code enforcement and compliance rates, and makes recommendations for targeting areas to improve compliance. FSEC has also published reports on the historical performance of Florida's building energy codes to determine more effective stringency and compliance strategies in the future.	
Baseline & Updated Compliance Studies	The FSEC completed a baseline compliance study in 2012, which was submitted to the DBPR. The report presents data on energy code enforcement and compliance rates, and makes recommendations for targeting areas to improve compliance.	
Stakeholder Advisory Group	The Energy Technical Advisory Committee (TAC) holds regular meetings on a number of building related energy issues, including building energy codes.	
Training/Outreach	A multi-faceted Florida Energy Code compliance methods, tools and field verification training program was established that included the development of two instructor-led and two web-based courses, instructor training and course development support, and training of building officials and contractors throughout the state. On-site training has been performed by Building a Safer Florida (BASF) and energy code webinars by the Codes and Standards Office of the DBPR.	
Total		1.5
Georgia		
Gap Analysis/Strategic Compliance Plan	The Georgia Environmental Finance Authority (GEFA) and the Georgia Department of Community Affairs (DCA) have, in partnership with the Home Builders Association of Georgia, developed a program for builders to rent duct blasters and blower doors for compliance, which was a result of a previously completed gap analysis. GEFA has also in the past funded a study for evaluation and best practices for compliance.	
Training/Outreach	GEFA has funded Southface over the years to provide training in code compliance.	

State	Compliance Activities	Score
Total		1
Hawaii		
Baseline & Updated Compliance Studies	The last compliance study was conducted in 1999.	
Training/Outreach	Statewide energy code training seminars were provided to the public and private sectors February 2012 and November 2012. In addition, speeches or training sessions were delivered to key building organizations upon request.	
Total		1
Idaho		
Gap Analysis/Strategic Compliance Plan	In June 2011, the Idaho Energy Codes Collaborative published a plan for 90% Compliance with the 2009 IECC by 2017, tasked by Pacific Northwest National Laboratory. The plan has been submitted to the Idaho Governor's Office of Energy Resources, which will determine the steps necessary to follow the plan and meet compliance with the code.	
Baseline & Updated Compliance Studies	Starting in June of 2010, the Idaho Division of Building Safety (DBS), through an agreement with the Idaho Office of Energy Resources (OER), developed and implemented The Idaho Energy Code Compliance Database for tracking compliance. The database has been fully operational since June of 2012. Northwest Energy Efficiency Alliance (NEEA), with additional support from Idaho Power and Avista Utilities, just completed a study of residential energy code compliance in Idaho with positive results: using three different methodologies, estimated compliance rates were 90%, 83% and 109%. The greater than 100% result from energy modeling shows that many homes are going beyond the minimum requirements.	
Stakeholder Advisory Group	The Idaho Energy Code Collaborative discusses code compliance, but that is not the main focus.	
Training/Outreach	The OER and DBS work in cooperation with stakeholders of the Idaho Energy Code Collaborative to provide energy code trainings for builders, contractors and building officials in all geographic regions of Idaho. Direct assistance for energy code compliance is available throughout Idaho. Energy Code trainings are also available through DBS, Idaho Association of Building Officials (IDABO) and other members of the Idaho Energy Code Collaborative.	
Total		1.5
Illinois		
Gap Analysis/Strategic Compliance Plan	The State Energy Office (Illinois Dept. of Commerce and Economic Opportunity) worked with BCAP to complete a gap analysis.	
Baseline & Updated Compliance Studies	The State Energy Office received a federal grant to conduct a compliance study. It was completed in 2011. The study found a compliance rate of 86% for residential buildings based on the buildings sampled, but the rate was adjusted to 79% to reflect the lack of cooperation from a couple jurisdictions. The compliance rate for commercial buildings was over 90% but a full statistically valid sample was not completed. The State Energy Office has provided training on the commercial codes for several years and has only recently adopted a residential code, so the commercial compliance rate should be higher than the residential.	
Stakeholder Advisory Group	The State Energy Office is sponsoring a Codes Claimed Savings Advisory Group (facilitated by the Midwest Energy Efficiency Alliance) to determine if the utilities and State Energy Office could do more to improve energy codes compliance and to document and claim the additional energy savings.	

State	Compliance Activities	Score
Training/Outreach	The Illinois Energy Office spends approximately $350,000 annually on its Building Codes Education and Technical Assistance program, providing training on the most current IECC-based commercial and residential codes, blower door training, HVAC right-sizing training, and its code interpretation hotline. In a new effort, the Illinois Energy Office is conducting a pilot program to train third-party inspectors and provide rebates to builders that use them in jurisdictions that have agreed to accept the third-party inspectors for enforcement purposes. Depending on the outcome of the pilot, the utilities may pay the rebates in the future.	
Total		1.5
Indiana		
Training/Outreach	The Division of Fire and Building Safety of the Indiana Department of Homeland Security (IDHS) has conducted several classes for state and local code enforcement officials with respect to the use of ComCheck and some basic energy conservation code information.	
Total		0.5
Iowa		
Gap Analysis/Strategic Compliance Plan	In 2012 the State worked with Pacific Northwest National Lab (PNNL) to produce the Iowa Compliance Implementation and Evaluation Guide. The Guide is designed to assist the State and Local Code Jurisdictions in achieving statewide compliance with the 2009 International Energy Conservation code for residential and commercial buildings.	
Baseline & Updated Compliance Studies	The DOE Residential Energy Code Pilot Study for Iowa was complete in June of 2011. The study has not been updated but the State Electrical Inspectors use the DOE inspection forms, for energy inspections, and data can be updated from this source.	
Utility Involvement	Alliant Energy, Cedar Falls Utilities and Mid American Energy have for the past two years sponsored day long training events targeting residential contractors, architects, real-estate professionals and appraisers. Each year the training happens in eight different locations around the state. The utilities cannot count education toward their energy efficiency impacts at this time.	
Stakeholder Advisory Group	The Building Codes Advisory Council is a Governor-appointed group that decides when and how the state building codes are adopted and if amendments are required. An Energy Codes Workgroup was invited to discuss the 2012 IECC and suggest amendments to allow advancement to this code. The Workgroup had thirty participants from all aspects of the construction of commercial and residential buildings.	
Training/Outreach	The State Energy Engineer hosts a number of seminars each year for code officials, architects, engineers and contractors. Group requests for educational seminars are never turned down and have been done for the American Institute of Architects to the International Association of Electrical Inspectors. The State Building Code Bureau has teamed up with the state investor-owned utilities, the Iowa Association of Building Officials and the Iowa Association for Energy Efficiency to provide training throughout the state.	
Total		1.5
Kansas		
Baseline & Updated Compliance Studies	The Kansas Corporation Commission's (KCC) annual survey of local jurisdictions provides an initial baseline for assessing adoption and compliance.	

State	Compliance Activities	Score
Stakeholder Advisory Group	The Kansas Corporation Commission (KCC) is establishing the Kansas Codes Collaborative, a stakeholder group involving utilities, local codes officials, and others. The new Codes Collaborative will build on the work of the previous Energy Efficiency Building Codes Working Group, with more emphasis on development and implementation of the plan to assess code compliance in local jurisdictions. The first meeting of the Codes Collaborative is tentatively planned for July 2013.	
Training/Outreach	The KCC will partner with Johnson County Contractor Licensing program to offer subsidized energy codes training for local contractors and codes officials.	
Total		1.5
Kentucky		
Gap Analysis/Strategic Compliance Plan	Kentucky partnered with the Building Codes Assistance Project to complete a gap analysis and strategic compliance plan in 2011.	
Total		0.5
Louisiana		
Training/Outreach	The state attends regular code council meetings to provide support to code officials. Presently, there is no new training classes scheduled due to pending legislation, but further classes are expected in the very near future.	
Total		0.5
Maine		
Training/Outreach	A training and certification program was launched simultaneously with the building energy code changes in 2010. All code officers are required to be certified and training is provided free of charge. Builders, architects and others are not required to be certified, but are encouraged to attend the training on a fee basis.	
Total		0.5
Maryland		
Gap Analysis/Strategic Compliance Plan	The Maryland Energy Association (MEA) completed a gap analysis and compliance plan, "Reaching 90% Compliance: Maryland Building Code Compliance Roadmap" in February 2012.	
Baseline & Updated Compliance Studies	In November and December 2012 MEA undertook a pilot project in Montgomery County, MD to track compliance with the residential provisions of the 2009 IECC. Compliance specialists were embedded in the permitting office in the county and observed plan review, site inspections and compliance procedures to arrive at an estimate of current compliance and to consult on improving processes. The results of the pilot will be used to improve compliance statewide.	
Stakeholder Advisory Group	MEA established a Codes Compliance Work Group (CCWG) in 2012. The CCWG was put together last year and met three times to give input and direction to MEA's efforts at increasing compliance with the code. The group is composed of MEA, the Department of Housing and Community Development (DHCD), local code officials, architects, builder's trade groups and builders. There are about 20 members.	
Training/Outreach	The DHCD, Codes Administration, held training through 2012 and into 2013 on the IECC -- Significant Changes and Fundamentals Seminar. MEA is also currently funding a series of onsite trainings targeting building tradespeople. The topic of the training sessions is "building science and the 2012 IECC."	
Total		1.5
Massachusetts		

State	Compliance Activities	Score
Gap Analysis/Strategic Compliance Plan	The MA Department of Energy Resources and Department of Public Safety have been collaborating on strategies for improving energy code compliance, including the addition of continuing education requirements, and associated training. The compliance studies mentioned below provided insight into compliance risks and opportunities.	
Baseline & Updated Compliance Studies	In the past two years Massachusetts' utilities have completed a 2011-12 study of commercial building energy code compliance and a two-part residential building energy code compliance study. The first part of the residential study jointly funded by the Department of Energy Resources (DOER) and utilities sampled homes built to the 2006 IECC, homes built to ENERGY STAR (over a third of new construction), the second part assessed compliance to the 2009 IECC. The residential studies show code compliance rates of over 90% for HERS rated (stretch code and ENERGY STAR homes), and over 80% in IECC 2006 homes. Enforcement is performed by local building code officials. In the 131 towns and cities that have elected to adopt the state's 'stretch' energy code, enforcement of the building energy code is greatly assisted by the integrated role of HERS raters in performing building envelope testing and documenting code compliance levels of energy performance. Code compliance in these communities is estimated at close to 100% for residential buildings, and energy savings are clearly documented by the performance-based HERS rating approach.	
Utility Involvement	A framework of savings attribution for utilities is being developed.	
Training/Outreach	The Green Communities Act requires the Board of Building Regulations and Standards (BBRS) and the DOER to develop specific energy efficiency training and certification for all local code officials. No training has been conducted to date in 2013 as MA awaits code cycle updates to the 2012 IECC / ASHRAE 90.1-2010.	
Total		1.5
Michigan		
Gap Analysis/Strategic Compliance Plan	Partnering with the Building Codes Assistance Project, the state has completed a gap analysis and strategic compliance plan, both in 2011.	
Training/Outreach	The state energy office recently dedicated some U.S. DOE SEP funding for training to be conducted through Michigan State University. Otherwise, a number of code official organizations provide regular training throughout the state. The Bureau of Construction Codes also provides code training.	
Total		1
Minnesota		
Baseline & Updated Compliance Studies	Minnesota is currently undergoing a 90% Compliance Study required by the Department of Energy as a result of the American Recovery and Reinvestment Act. The study has not yet been completed. The Department intends to use this study along with energy modeling to determine the potential for energy savings as a result of code compliance and cost-effective programming that can be implemented to achieve higher levels of compliance.	
Utility Involvement	The Department of Commerce is currently involved in a stakeholder process with utilities in Minnesota to identify where utilities can support code compliance and claim energy savings as a result of this support.	
Training/Outreach	Training is provided in the spring and fall by the Department of Labor and Industry.	
Total		1
Mississippi		

State	Compliance Activities	Score
Gap Analysis/Strategic Compliance Plan	As new energy codes were adopted in April 2013, a gap analysis has not yet been completed, but is planned to be performed. As the state organizes an Energy Code Collaborative, the Mississippi Development Authority (MDA) will be working to ensure that implementation is comprehensive, and a strategic compliance plan will be developed.	
Baseline & Updated Compliance Studies	In June 2011, BCAP and Southface produced an economic analysis for building energy code adoption in Mississippi. This study estimated baseline compliance based on DOE data for building energy code compliance in jurisdictions across the State. Based on recent estimates, a large percentage of the State's population reside in jurisdictions that have adopted a residential building code. Based on the June 2011 Energy Codes Economic Analysis conducted by BCAP and Southface, as well as additional data collected by MDA, approximately 60% (1.75 million out of a total 2.9 million residents) of the state's population reside in cities or counties with building codes equivalent to 2003 IBC or higher, and the average code standard for these local jurisdictions is 2006 ICC.	
Stakeholder Advisory Group	An advisory group, the Mississippi Building Energy Codes Collaborative, is currently being formed to meet on a quarterly basis for the implementation of both code training and enforcement. The Collaborative will be comprised of local and State code enforcement officials, builders, contractors, architects, engineers, energy managers, facility managers, and State government officials. The first meeting was held in June 2013.	
Training/Outreach	There are 5 energy codes training sessions planned for 2013-2014 that will educate codes officials, engineers, and architects statewide about the new ASHRAE 90.1-2010 mandatory energy building code for commercial and state-owned buildings. These codes training sessions will complement the work of MDA by leveraging a network of officials to educate and implement the new building energy code standard.	
Total		1
Missouri		
Gap Analysis/Strategic Compliance Plan	In 2011, Missouri completed a gap analysis with assistance from the Building Codes Assistance Project.	
Stakeholder Advisory Group	In 2013, the Division of Energy is convening a compliance workgroup to assist in development of a plan to evaluate compliance with the ARRA Section 410 provisions related to building energy codes. The workgroup will work with local code officials and interested stakeholders to conduct self-evaluations of code compliance, identify training needs, conduct training and perform a second or third-party assessment of compliance following U.S. DOE's compliance planning methodology.	
Training/Outreach	There is no state-sponsored training at this time, but the Division of Energy will be involved in training for local government code officials as part of the code compliance work it is undertaking in 2013-2016.	
Total		1
Montana		
Baseline & Updated Compliance Studies	Ecotope; Residential and Commercial Study in 2000. Cadmus Residential report in 2012 (funded by NEEA). In 2012, the MT Department of Environmental Quality (DEQ) surveyed HVAC and insulation contactors on energy code compliance issues.	
Stakeholder Advisory Group	Montana Energy Code Collaborative coordinated by Northwest Energy Efficiency Alliance (NEEA) and National Center of Appropriate Technology (NCAT).	

State	Compliance Activities	Score
Training/Outreach	DEQ conducts on–site energy code meetings twice a year with most code officials. DEQ provides Residential and Commercial Energy Code summary booklets to all building department offices. In conjunction with the Montana Department of Labor and Industry, Residential Energy Code Summary booklets and energy component labels are delivered to all new houses in Montana. DEQ conducts onsite trainings with building code departments and contractors utilizing a blower door and infrared camera. DEQ also provides a 2 credit-hour energy code training session to real estate professionals and estimates that 40% of Montana real estate sales staff has attended a training session.	
Total		1
Nebraska		
Gap Analysis/Strategic Compliance Plan	Nebraska has completed a gap analysis produced by BCAP. Nebraska has also completed a strategic compliance plan produced by BCAP.	
Baseline & Updated Compliance Studies	The Nebraska Energy Office completed a statistically valid evaluation of recently built homes for energy code compliance in 2012. One hundred homes in 18 counties (only 44 homes were needed for a statistically valid sample) were evaluated by a RESNET Certified Home Energy Rater. In aggregate, the state average of energy code compliance was 64.7 percent. The highest compliance score was 83.67 percent, the lowest was 42.55 percent. Regional compliance rates were also calculated. The Energy Office is participating in a code compliance study being conducted by the Institute for Market Transformation by a former PNNL staff member. That study of approximately 40 Nebraska homes in the three metropolitan counties will be completed later this year. The study will also provide an assessment of the effectiveness of the localized, customized, one-on-one training being provided to codes staff members.	
Utility Involvement	The state's three largest publicly-owned electric utilities—Lincoln Electric System, Nebraska Public Power District and Omaha Public Power District—have a long history of providing very strong support (financial and in-kind) for building energy code upgrades, training, and code compliance activities. In the most recent example, Omaha Public Power District provided $10,000 in support of the Great Plains Energy Codes Conference. In the past, all of the utilities have provided financing, conference facilities and other types of support.	
Stakeholder Advisory Group	Nebraska formed a Codes Compliance Collaborative in March 2013 with the assistance of BCAP/OCEAN and the Midwest Energy Efficiency Alliance. There are approximately 35 active participants (code officials, homebuilders, state and local policymakers, utility representatives, architects and designers, HVAC professionals, home energy raters, educators, a lender, suppliers, advocacy groups, and a representative from a general contractors organization) who are working on the structure of the collaborative, tasks and missions and funding.	
Training/Outreach	The state is targeting codes officials, builders and other professions such as appraisers, property tax assessors and realtors with workshop opportunities. At least four distinct types of training/information opportunities for codes officials and others will be provided in 2013. To maximize code official participation, the agency is providing training workshops in conjunction with the codes officials' association meetings. One session, blower doors and duct blasters, is designed to educate codes officials and staff on this equipment since blower door tests are an essential element of the 2012 IECC.	
Total		2
Nevada		

State	Compliance Activities	Score
Gap Analysis/Strategic Compliance Plan	A gap analysis study was completed in 2011, which looks into the current state of code implementation and offers suggestions to increase compliance. A strategic compliance plan was also completed in 2011, detailing feasible actions the state should take in order to meet 90% compliance with the 2009 IECC by 2017. The state provided support to local jurisdictions under American Recovery and Reinvestment Act funding to pilot its Building Energy Codes Program, developed compliance tools to learn how local jurisdictions will or can use the tools, and estimated the time and expense it will cost the local jurisdictions.	
Baseline & Updated Compliance Studies	A survey was conducted in September 2010 and revised in the previous two years. Information gathered recently is incomplete, but will be completed and is expected to be made available later this year.	
Utility Involvement	NV Energy (Nevada's largest investor-owned utility and the major provider in the state) has been very supportive by hosting Energy Office sponsored training sessions on energy codes, including providing lunch for attendees and providing any necessary equipment to make the training effective.	
Stakeholder Advisory Group	The Nevada Code Collaborative was formed in April 2012.	
Training/Outreach	Several training sessions have been offered on the Residential and Commercial Provisions of the 2009 IECC. The Code Collaborative has formed a Training Subcommittee to determine current and future training needs.	
Total		1.5
New Hampshire		
Gap Analysis/Strategic Compliance Plan	The *NH Energy Code Compliance Roadmap* was completed as part of the NH Energy Code Compliance project, initiated by the American Recovery and Reinvestment Act (ARRA).	
Baseline & Updated Compliance Studies	A baseline study was completed two years ago by GDS Associates as part of the NH Code Compliance project completed under ARRA.	
Utility Involvement	Utilities have taken the initiative to sponsor trainings, such as part of the NH Energy Code Challenge.	
Stakeholder Advisory Group	The NH Building Energy Code Compliance Collaborative was established as part of the NH Energy Code Challenge, which is a stakeholder group of diverse professionals and individuals from a broad range of industries.	
Training/Outreach	NH is actively involved in the NH Building Energy Code Compliance Collaborative but is no longer funding this group as of June 30, 2013. The NH Office of Energy and Planning remains a key member of the collaborative and is a sponsor of training workshops.	
Total		1.5
New Jersey		
Stakeholder Advisory Group	There is a Uniform Construction Code Advisory Board and energy mechanical code subcommittee made up of appointed officials and design professionals. Stakeholder meetings are open to the public.	
Training/Outreach	The Department of Community Affairs offers mandatory training for new officials throughout the state as well as a six month education course.	
Total		1
New Mexico		
Gap Analysis/Strategic Compliance Plan	New Mexico completed a gap analysis and a strategic compliance plan in 2011 in partnership with the Building Codes Assistance Project.	

State	Compliance Activities	Score
Stakeholder Advisory Group	The Construction Industries Division convenes technical advisory groups whenever they have an implementation problem to resolve.	
Training/Outreach	Code officials receive training through the Construction Industries Division on a regular basis.	
Total		1
New York		
Baseline & Updated Compliance Studies	In 2011, the New York State Energy Research and Development Authority (NYSERDA) completed a baseline compliance assessment of new residential and commercial buildings in response to New York State's goal of reaching 90% compliance with the Energy Conservation Construction Code of New York State-2010 (ECCCNYS) by 2017, a condition of receiving federal funds through the American Recovery and Reinvestment Act of 2009 (ARRA). The baseline study examined residential new construction permitted under the ECCCNYS-2007 and commercial new construction permitted under Standard 90.1 2004 and 2007 and, in general, followed U.S. DOE protocol for measuring compliance. The study also established rates of compliance by U/A Alternative method using REScheck and COMcheck software. The study found residential new construction compliance rates of 73% and 61% (DOE protocol and REScheck, respectively) and commercial new construction compliance rates of 85% and 36% (DOE protocol and COMcheck, respectively).	
Utility Involvement	In October 2011, the New York State Public Service Commission issued an Order that includes over $16 million in funding for Advanced Energy Codes and Standards as part of NYSERDA's Technology and Marketing Development Program Operating Plan for 2012-2016. Long Island Power Authority has developed HERS infrastructure to promote codes and provides financial support for towns that adopt ENERGY STAR specifications as the local code.	
Stakeholder Advisory Group	NYSERDA staff and contractors conduct regular meetings with the code enforcement, design and construction communities. NYSERDA is hosting a Code Enforcement Official Summit in June 2013 to gain feedback on ongoing training and support services offered by NYSERDA, as well as future needs. Formal quarterly meetings are held with the New York Department of State, the agency responsible for all code promulgation and enforcement in New York State, to maintain a dialogue on the ECCCNYS.	
Training/Outreach	Between June 2010 and March 2013, NYSERDA delivered roughly 560 classroom training sessions of 17 courses to more than 17,000 attendees. Courses focused on various aspects of the residential and/or commercial provisions of the ECCCNYS-2010 and, in general, qualified for at least American Institute of Architects (AIA) and DOS continuing education credits. Over this three year period, NYSERDA also provided free code support to municipalities statewide through plan review services (over 200 free plan reviews conducted) and code advisement in the form of a question/answer hotline, in-office training and support and inspection assistance, as well as online training through an energy code website. NYSERDA expects to launch new training and direct municipal support services in early 2014 which will focus on the ECCCNYS commercial (2013) and residential (2014) provisions, which will run through the end of 2016. NYSERDA will also make updates to its energy code website and is in the process of working with the International Code Council (ICC) to produce a Code Commentary specific to New York's upcoming code changes which will be delivered to every municipal code office in the state and made available for purchase through the ICC's website.	
Total		1.5
North Carolina		

State	Compliance Activities	Score
Training/Outreach	The Engineering Division of the NC Department of Insurance regularly conducts code training through various state associations and they have energy conservation code training modules available on their website.	
Total		0.5
North Dakota		
Training/Outreach	The State has provided statewide training on the energy code to building officials and contractors.	
Total		0.5
Ohio		
Gap Analysis/Strategic Compliance Plan	Building Codes Assistance Project (BCAP) completed an Ohio Gap Analysis report in 2010. Ohio Development Services Agency (DSA) has contracted BCAP to update that report, and to create a strategic compliance plan.	
Utility Involvement	American Electric Power Ohio and Columbia Gas provide funding for training as part of the Ohio Energy Codes Ambassador Program. Utility support is voluntary: the Public Utilities Commission of Ohio does not require utility investment in code compliance efforts.	
Training/Outreach	Ohio DSA has facilitated development of an Ohio Energy Codes Ambassador Program, which has trained eight code officials from various regions of the state on Ohio's most recently adopted codes. Four of these officials have already passed at least one energy certification exam and thus earned the title of ICC Energy Code Ambassador. From there, they will provide support, mentoring, and/or customized assistance to their peers in nearby jurisdictions. They will be awarded honorariums for each visit to assist their peers, through December 31, 2013. Funding for this program is provided by American Electric Power of Ohio (an electricity utility) and Columbia Gas of Ohio (a natural gas utility). Other plans are for a circuit rider program that would start in January 2014 wherein two code ambassadors, or trainers, would be contracted by BCAP to travel to code offices statewide, providing customized assistance and collecting compliance data in the form of established checklists and surveys.	
Total		1
Oklahoma		
Gap Analysis/Strategic Compliance Plan	BCAP worked with Oklahoma stakeholders in 2012 to develop its Gap Analysis and Strategic Compliance Plan.	
Training/Outreach	The Construction Industries Board (CIB) documents continuous education, training, and outreach for Oklahoma Code Officials, contractors and trades people.	
Total		1
Oregon		
Baseline & Updated Compliance Studies	A 2013 Residential Compliance study is underway, conducted by the Northwest Energy Efficiency Alliance (NEEA). A NEEA study on compliance in Oregon was conducted in 2008. Compliance was measured at 93%.	
Utility Involvement	Energy Trust of Oregon and the Northwest Energy Efficiency Alliance (NEEA), both supported by utility funding, are very active in demonstration / market transformation initiatives that lead the next code cycle. Because of the unique mechanism in Oregon, the utilities can pool their resources to provide more coverage and opportunities at a lower cost than would be possible if they were working independently.	

State	Compliance Activities	Score
Stakeholder Advisory Group	NEEA is an active stakeholder advisory group. They are funding the next residential survey on code compliance. There is a State Board, the Construction Industry Energy Board. There is also the 2014 Oregon Energy Efficiency Code Committee (OEESC).	
Training/Outreach	All building officials are required to be certified by the state and complete 16 hours of continuing education every three years. A variety of training formats and venues are made available directly through the Buildings Code Division (BCD) and others through partners such as the Oregon Building Officials Association (OBOA) and Oregon Homebuilders Association (OHBA). In addition, NEEA has developed and is presenting a modified version of the BCD energy code training.	
Total		1.5
Pennsylvania		
Gap Analysis/Strategic Compliance Plan	The Pennsylvania Department of Environmental Protection (PA DEP) funded the "Pennsylvania Gap Analysis" conducted by the Building Codes Assistance Project. Over 90% of Pennsylvania's 2,562 municipalities have elected to administer and enforce the UCC locally using their own employees or via certified third party agencies.	
Training/Outreach	Code officials receive training in anticipation of passing the exams required to obtain initial certification. To augment current training opportunities, the PA DEP has provided funding with Department of Energy State Energy Program funds through the Pennsylvania State Association of Township Supervisors and Pennsylvania Codes Construction Academy (PCCA) to train contractors and code officials in 2011 and 2012. Education and training will continue to be an important component to ensure contractors and code officials receive the tools and knowledge for compliance.	
Total		1
Rhode Island		
Gap Analysis/Strategic Compliance Plan	The baseline code compliance studies noted below included a comprehensive survey of all stakeholders in the building and code industry, with an emphasis on code officials. This survey offered a host of recommendations for strategic planning and subsequent improvement in code compliance and better building. These findings were integrated into the strategic planning for the Code Compliance Enhancement Initiative—only one piece of Rhode Island's long-term plan on the advancement of codes.	
Baseline & Updated Compliance Studies	The State of Rhode Island and National Grid jointly funded residential and commercial code compliance baselines studies in 2012. The residential baseline study found that on average a Rhode Island newly constructed home achieved 56% compliance with the prevailing energy code compliance checklist. On the commercial side, the average building was found to either be 70% compliant with the prevailing energy code, or using 30% more energy than fully code compliant buildings.	
Utility Involvement	The Rhode Island Public Utilities Commission (PUC) is very supportive of utility involvement in supporting building energy code compliance, highlighted by its December 2012 approval of National Grid's 2013 Code Compliance Enhancement Initiative. This Initiative uses ratepayer funds through the Systems Benefit Charge to fund trainings, workshops, and conduct technical assistance circuit riding. The PUC also approved an evolving structure that will award energy savings, both gas and electric, to National Grid for its activities in the building code compliance arena.	

State	Compliance Activities	Score
Stakeholder Advisory Group	Since 2011, the RI Code Commission, NEEP, and National Grid have been working collaboratively on code advocacy, stretch code, and code compliance strategies. This collaborative approach led to the formalization of the Code Compliance Enhancement Initiative and will continue to monitor and oversee the implementation of the Initiative across the State in the coming years.	
Training/Outreach	In the past, the State engaged in training programs for code compliance primarily through the Code Commission's code trainings, National Grid's Residential New Construction program, and other association based trainings such as the Rhode Island Builders Association. The Code Compliance Enhancement Initiative is a significant complement for that protocol, as the crux of the Initiative is comprehensive training and technical assistance circuit rider outreach to all building code stakeholders; builders, code officials, architects, engineers, etc. The main difference between the two is the depth and breadth that the Code Compliance Enhancement Initiative will bring to Rhode Island.	
Total		2
South Carolina		
Gap Analysis/Strategic Compliance Plan	South Carolina has completed a gap analysis, analyzing the current code implementation efforts in the state and making recommendations for achieving 90% compliance with the model energy code. The state also participates in BCAP's Compliance Planning Assistance Program and completed a compliance plan in November 2011, providing a five-year roadmap for energy code implementation in the state.	
Training/Outreach	In 2012, 15 courses were held around the state. In addition, the SC Association of Heating and Air-Conditioning Contractors has been holding regional training sessions around the state in conjunction with local code offices. The SC Energy Office (SCEO) made infrared cameras available to all county building code offices and those in the ten largest cities, contingent upon recipients receiving training on their use. In addition, the SCEO held two training workshops on code compliance for commercial/institutional buildings. These workshops were offered in conjunction with the state chapter of the U.S. Green Building Council and provided training for LEED credential maintenance, as well as American Institution of Architects (AIA) credits and building code continuing education credits. The SCEO is also exploring DET training with Southface and a consortium of the SC Association of Heating and Air-Conditioning Contractors and the SC Homebuilders Association. The plan would be to "train the trainer" and then have in-state trainers available to train contractors as well as additional trainers.	
Total		1
South Dakota		
Total		0
Tennessee		
Training/Outreach	The Tennessee Fire and Code Academy is hosting courses both in person and online. In summer 2013 the Academy will begin teaching courses on 2012 IECC.	
Total		0.5
Texas		
Baseline & Updated Compliance Studies	The South-Central Partnership for Energy Efficiency as a Resource (SPEER) collaborated with the Texas State Energy Conservation Office (SECO) to conduct a baseline study. The study did not attempt to measure compliance rates per se, nor was it released to the public. The main goal was to determine a starting point for Texas to evaluate compliance, to determine what could be documented and identify next steps.	

State	Compliance Activities	Score
Stakeholder Advisory Group	The Texas Energy Code Compliance Collaborative is run by SPEER in collaboration with SECO.	
Training/Outreach	SECO provides several training programs around the state and has established an online training center, The Texas Energy Code Training Center.	
Total		1
Utah		
Baseline & Updated Compliance Studies	Utah participated in a compliance pilot study in 2011 using a methodology developed by the Pacific Northwest National Laboratory that showed compliance above 85% for residential and 80% for commercial buildings (both new and renovated).	
Utility Involvement	The Office of Energy Development provides energy code training in collaboration with Rocky Mountain Power and Questar Gas.	
Training/Outreach	The Office of Energy Development provides energy code training in collaboration with Rocky Mountain Power and Questar Gas.	
Total		1
Vermont		
Gap Analysis/Strategic Compliance Plan	A gap analysis and energy code compliance plan was completed for Vermont and is available on its website.	
Baseline & Updated Compliance Studies	The Department of Public Service (DPS) measured compliance with RBES and CBES in our recent Market Assessments, which were completed in February, 2013 and December, 2012 respectively. The technical compliance rate for residential was 74% and for commercial was 88%.	
Utility Involvement	Efficiency Vermont (EVT) maintains an Energy Code Assistance Center with a toll free number to provide assistance with energy codes. They also provide assistance for filling out certificates. After the state updated the codes they held numerous trainings to builders, architects, and realtors on the new requirements.	
Training/Outreach	There was a considerable effort to conduct trainings throughout the state when the new codes were first updated. Now there are trainings at meetings as requested (for example: EVT and DPS recently provided information on the energy codes to Act 250 Commissioners at their biannual training session).	
Total		1.5
Virginia		
Baseline & Updated Compliance Studies	The Department of Housing and Community Development (DHCD) completed a compliance assessment and submitted results to DOE/PNL in 2012.	
Stakeholder Advisory Group	The Virginia Building and Code Officials Association is a statewide organization of building safety professionals.	
Training/Outreach	DHCD provides code change training for 4,000 persons every 3 years. One-day on-line energy classes will begin in July 2013. DHCD conducts 3 days of code training every three years for the new codes and any changes. Local seminars occur more frequently. Each technical assistant goes through 3 days of training for each certification they hold and all must take 16 hours of continuing education every two years.	
Total		1
Washington		
Gap Analysis/Strategic Compliance Plan	Washington State developed a strategic plan for buildings. This plan includes recommendations for sustaining and expanding training opportunities, and evaluation of code compliance.	

State	Compliance Activities	Score
Baseline & Updated Compliance Studies	A residential code compliance study was completed by the Northwest Energy Efficiency Alliance (NEEA) in 2013. This report describes the compliance of residential new construction in Washington State with respect to the revised state energy code: 2009 Washington State Energy Code (WSEC). The study team assessed compliance using two different approaches: 1) Pacific Northwest National Laboratory (PNNL) Checklist Method and, 2) Significant Item Method. The Checklist Method analyzed how well the studied homes complied with each of the sixty-one code identified process and efficiency requirements, while the Significant Item Method analyzed compliance based on measures that were considered to have only the most significant impact on energy use. The completed study of residential energy code compliance in Washington demonstrates compliance rates at 96 percent and 97 percent for the Checklist and Significant Items Methods respectively. In addition, the study team assessed the energy impacts of code compliance by using a building simulation model to compare the relative energy use of "as-built" homes to the energy use of homes built to meet the prescriptive code. A commercial code compliance study was completed in 2008 by NEEA and was based on the code enforced in 2001, which was based on ASHRAE 90.1-1999. At the time, compliance was measured at 94%. A new study is in the design phase.	
Utility Involvement	The regions electric utilities provide significant funding for energy code training through the regional market transformation efforts at Northwest Energy Efficiency Alliance (NEEA). Through NEEA and by through individual energy conservation incentives provided by the utility, they provide additional funding for projects that move beyond minimum code. This includes single family, multi-family and commercial building incentives. This is rate based work approved by the utility commission. Washington has a mandatory conservation standard that requires the state's electric utilities to pursue "all cost effective conservation." This requires utilities to support cost effective new construction beyond code as well as existing building retrofit activities. The Energy Independence Act specifically recognizes that utilities may take credit energy savings attributed to codes, third party programs and utility hook-up standards.	
Stakeholder Advisory Group	Washington State works collaboratively with other NW state in the development and implementation of energy codes. The Northwest Energy Code Group organized through NEEA brings state energy office, code enforcement trainers, and utility staff together to identify code enforcement issues, share training strategies and to develop new code language. This group has contributed to the national code development and enforcement success. Resources developed by these states are available through the energycodes.gov web site. The NW Energy Code Group and participating members have developed many code change proposals that have been adopted by into the model codes, including the IECC, ASHRAE 90.1, 189.1 and ASHRAE 62.2.	
Training/Outreach	Washington State and NW regional collaborators have provided code training for more than 25 years. Code trainings are taken to the participants as requested by the states building departments, utilities and builder organizations. For the 2009-2012 code cycle, the Washington State University (WSU) Extension Energy program provided 215 trainings for a total of 5164 students. This includes classroom training on all aspects of the code. It also includes field training with emphasis on completing air leakage testing certification required by the WA code. WSU also provides a detailed web site with numerous training aids, a builders' field guide and supplemental information to assist in code compliance. http://www.energy.wsu.edu. The Northwest Energy Efficiency Council provides training for the commercial sections of the state energy code. For the 2009 to 2012 code cycle NEEC provided training to approximately 2500 participants. NEEC also provides a detailed website with numerous training aids, compliance forms and supplemental information to assist in code compliance.	

State	Compliance Activities	Score
Total		1.5
West Virginia		
Gap Analysis/Strategic Compliance Plan	Compliance study completed through BCAP.	
Stakeholder Advisory Group	An informal partnership of stakeholders in W.Va.'s built community worked together to effect the adoption of the 2009 IECC, evidenced by a slightly later effective date for the code. Parties agreed to a later implementation date so that the W.Va. Division of Energy could provide training on the new code to as many home builders as possible. This partnership was formalized at the "Next Steps" meeting on May 16, 2013, at the offices of the W.Va. Division of Energy. Representatives from the home builders, code officials, architects and, importantly, realtors met to determine the next steps for continuing education, including CE credits for each industry, on the codes. Appraisers have since joined the effort.	
Training/Outreach	Under the State Energy Program, WVDOE provided funding to the Community and Technical College System of W.Va. to develop energy code training and advance building performance expertise. Outcomes included statewide training sessions and conferences and the incorporation of energy codes into curriculum and presentations to state educators, lawmakers and the general public. These stakeholders helped secure the passage of SB 76, the Green Building Act of 2012, which became effective July 1, 2012, and required that all new state-funded construction comply with ASHRAE 90.1-2007. Additionally, the program provided training to energy auditors using the Building Performance Institute curriculum. Under ARRA's Energy Efficiency and Conservation Block Grant program in West Virginia, WVDOE funded a Building Energy Collaborate, which provided training on the energy codes to city and county officials involved in the grant program. The ARRA-supported work plus the work of WVDOE's new link to the state's residential contractors led to a partnership that resulted in the inclusion of the 2009 IECC and ASHRAE 90.1-2007 in the state building code.	
Total		1
Wisconsin		
Baseline & Updated Compliance Studies	WI received funding from the U.S. DOE to implement a pilot study of compliance in commercial buildings. The study found that new commercial buildings were typically over 90% in compliance with the current commercial building code (at that time the 2006 IECC with WI amendments as addressed under SPS 363).	
Training/Outreach	All licensed Uniform Dwelling Code (UDC) and WI Commercial Building Inspectors are required to obtain continuing education credits in order to renew their license. Each late winter/early spring, the 4 inspector associations put on trainings, but it is not mandatory. The Department of Safety & Professional Services offers various training courses throughout the year, which are also not mandatory. Some courses are available online, while others are addressed by organizations such as WI Focus on Energy, Energy Center of WI, WI Builders Association and others.	
Total		1
Wyoming		
Stakeholder Advisory Group	Wyoming Conference of Building Officials (WBCO) is the state's stakeholder advisory group	
Training/Outreach	The Wyoming State Energy Office has ongoing seminars on building energy codes available.	
Total		1

Appendix G: Expanded Table of State R&D Programs

State	Major R&D Programs	Score
California	The **California Energy Commission's Public Interest Energy Research (PIER)** program supports research and development in several key areas including energy efficiency for buildings, industry, agriculture, and water systems. PIER is funded from a surcharge on electricity and natural gas use in the state that totals about $80 million per year. UC Davis houses the **Center for Water-Energy Efficiency (CWEE)** and the **Energy Efficiency Center (EEC)**. CWEE focuses on the research and development of efficient technologies that will lead to the conservation of water and energy resources. CWEE has a permanent staff of three and receives funding from the EEC, the California Lighting Technology Center, and the Western Cooling Efficiency Center. The EEC's mission is to accelerate the development and commercialization of energy efficiency technologies. It received initial funding from the California Clean Energy Fund. The **Center for Energy Science and Technology Advanced Research (CESTAR)** at UCLA includes energy efficiency as one of its four major research areas. The **Smart Grid Energy Research Center (SMERC**) also performs research into the development of the next generation of the electric utility grid, with one of their criteria being improving its efficiency.	1.5
Colorado	**The Engines and Energy Conversion Lab (EECL) at Colorado State University** contributes to energy efficiency in their research on smart grid technology and engine efficiency, primarily in advanced ignition systems and after-treatment systems. **The Institute for the Built Environment (IBE) at Colorado State University** engages faculty and industry partners in healthy and sustainable building issues including energy-efficient construction, integration of clean energy technologies and sustainable built environments. **The Renewable and Sustainable Energy Institute (RASEI) at the University of Colorado, Boulder** is a joint institute with the National Renewable Energy Laboratory (NREL) to research and develop ways to produce energy at a lower cost, with higher efficiency, and with reduced emissions. **The Research in Delivery, Usage, and Control of Energy (ReDUCE) research group at the Colorado School of Mines** includes energy efficiency projects such as the Cyber-Enabled Efficiency Energy Management of Structure, sponsored by the National Science Foundation, which concerns the sensing and control of energy flow in buildings, as enabled by cyber infrastructure. **The Center for Renewable Energy Economic Development (CREED)** is a catalyst for economic development in Colorado through clean energy and energy efficiency innovation and entrepreneurship. CREED is a product of NRELand partners with state government agencies such as the Governor's Energy Office and the Office of Economic Development and International Trade and industry groups such as the Colorado Cleantech Industry Association. NREL also partners with state universities as part of the **Colorado Energy Research Collaboratory**, a research consortium that works with industry and public agencies to create and speed the commercialization of renewable energy technologies and energy efficiency.	1.5
Connecticut	The **University of Connecticut's Center for Clean Energy Engineering (C2E2)** focuses on advanced energy conversion technologies, fuels and fuel processing, energy storage, power management and smart grid and conservation of natural resources with a focus on water. The center employs a portfolio of multidisciplinary faculty through the Sustainable Energy Initiative.	1.5

State	Major R&D Programs	Score
Florida	**The University of Central Florida's Florida Solar Energy Center's (FSEC)** building science program includes energy efficiency research relating to buildings, schools, and green standards. The Center has a staff of 150 and receives $3 million in operating funds annually from the University and $8-$12 million in external grants. **The Energy and Sustainability Center (ESC) at Florida State University** focuses on energy efficiency projects including the Center's Off-Grid Zero Emission Building project, which created an energy-efficient mold for alternative energy technologies in both residential and commercial buildings, and research focused on both PEM fuel cells and water electrolysis. The center has a staff of seven and receives funding from the University. The **University of Florida's Florida Institute for Sustainable Energy (FISE)** performs efficiency research that focuses on fuel cells, building construction, and lighting. The Institute has a faculty of over 150 spread among 22 energy research centers and its funding over the past several years has totaled $70 million. **Clean Energy Research Center (CERC) at University of South Florida** specializes in the development of environmentally clean energy sources and systems that meet the needs of power and energy producers and the transportation sector. Florida Energy Systems Consortium (FESC) develops innovative energy systems that lead to alternative energy strategies, improved energy efficiencies, and enhanced economic development.	1.5
Nebraska	The **Nebraska Center for Energy Sciences Research (NCESR)** is a collaboration between the University of Nebraska-Lincoln and the Nebraska Public Power District, established in 2006 to conduct research on renewable energy sources, energy efficiency and energy conservation, and to expand economic opportunities in Nebraska. TO date, $8 million has been contributed to the initiative. The **Energy Savings Potential (ESP) program** is a collaboration between the University of Nebraska at Omaha and Omaha Public Power District. Between 2006 and 2012, $3.5 million was been spent on research that focuses on customer behavior and ways to reduce energy consumption. **University of Nebraska Utility Corporation (NUCorp)** is a partnership between Lincoln Electric System and the University of Nebraska-Lincoln to develop new projects for identifying, financing, implementing and tracking demand-side management and energy efficiency projects at the university.	1.5
New York	The **New York State Energy Research and Development Authority (NYSERDA**) supports a broad range of technology research, development and commercialization activities. NYSERDA makes strategic investments in scientific research and market analysis and develops and tests new products and technologies that have the potential to improve energy efficiency and expand energy options in New York's buildings, industrial, transportation, power, and environmental sectors. NYSERDA has developed three Proof of Concept Centers (POCC) and Incubators to commercialize energy-efficient technologies. NYSERDA's 2011-2011 budget for RD&D was approximately $64 million. The **Center for Sustainable & Renewable Energy (CSRE) at the State University of New York** is a clearing house for all 64 SUNY campuses' research and development in the areas of energy efficiency and sustainability, including the New York "Green Campus" Energy Efficiency Initiative. The **Building Energy and Environmental Systems Laboratory (BEESL) at Syracuse University** is a research lab associated with the Syracuse Center of Excellence in Environmental and Energy Systems, the New York Strategically Targeted Academic Research Center for Environmental Quality Systems, and the New York Indoor Environmental Quality Center. The Laboratory advances technologies related to a number of environmental issues, including energy efficiency in buildings. It was established in November 1999 with funds from U.S. EPA, New York State Assembly, investor-owned utility National Grid, Syracuse University, and private donations. The **Institute for Urban Systems at City University of New York (CIUS)** identifies innovative solutions to the problems of aging capital stock, advances environmental sustainability, and works to increase urban economic competitiveness in the management of transportation, energy, water, buildings, and other infrastructure systems. **The Energy and Environmental Technology Application Center (E2TAC) at Albany State University** is also at the forefront of energy related issues such as smart grid energy efficiency, thermoelectric, power electronics, sensors and superconductors, and advanced PVs.	1.5

State	Major R&D Programs	Score
North Carolina	The **North Carolina Solar Center** has a focus on energy efficiency to assist commercial and industrial clients in saving energy. This team operates multiple programs focusing on combined heat and power technology in the Southeast, and the Center also operates the Database of State Incentives for Renewables & Efficiency. The **Center for Energy Research and Technology (CERT) at North Carolina A&T State University** conducts research on reducing energy and water consumption and promoting sustainable energy design practices. The Center promotes and develops strategies for the reduction of carbon dioxide emissions, energy independence, and net-zero energy and sustainable design practices. The **Appalachian State University Energy Center** is an applied research and public service program through which the university makes its resources, faculty, and professional staff available to address economic, business, government and social issues and problems related to renewable energy policy, technology and development.	1.5
Oregon	The **Oregon Built Environment and Sustainable Technologies Center (BEST)** is an independent, nonprofit organization established by the Oregon legislature to help Oregon businesses compete globally by transforming and commercializing university research into new technologies, services, products, and companies. BEST shares research facilities for the study of energy-efficient and green buildings as well as providing energy efficiency research grants. The **University of Oregon Energy Studies in Building Laboratory** conducts research on buildings and transportation to develop strategies for maximum energy efficiency in new materials, components, assemblies, and whole buildings. It has a staff of six and has received funding from numerous private and public sources totaling $16 million over the past 20 years. The **Baker Lighting Lab at the University of Oregon** provides support and opportunities for the exploration of lighting design, including studying daylighting and the control of these systems. **Portland State University's Renewable Energy Research Lab** conducts research on sustainable urban development, which covers smart grid development and net-zero energy use. The Lab is a joint project of the University and Portland General Electric, established in 2010 with $50,000 in funding from the utility. The **Energy Trust of Oregon** is an independent nonprofit organization dedicated to helping utility customers benefit from saving energy and generating renewable energy. In the area of energy efficiency, the Trust runs programs to field test emerging technologies. The **Oregon Transportation Research and Education Consortium (OTREC)** is a national University Transportation Center and a partnership between Portland State University, the University of Oregon, Oregon State University and the Oregon Institute of Technology. The group supports innovation through advanced technology, integration of land use and transportation, and healthy communities, and has also teamed up with Portland-based Green Lite Motors to bring a 100 mile-per-gallon vehicle closer to market.	1.5
Wisconsin	The **Energy Center of Wisconsin** conducts technology and field research, energy efficiency program evaluation and market research, offers education programs, and develops and implements programs. The Center has a staff of 44 and has an annual budget of approximately $2 million from state, customer, private, and other sources. **Wisconsin Focus on Energy** operates an Emerging Technology program that promotes emerging, industrial, energy efficiency technologies. The program deploys and commercializes technologies that have the potential for large, cost-effective energy savings and that have multiple installations in Wisconsin, and it can provide technology evaluations, development plans, and funding for businesses that have developed new technologies. Solar Energy Lab (SEL) at University of Wisconsin emphasizes the application of engineering concepts to energy problems, including solar heating, PVs, dessicant and absorption cooling, and HVAC and air quality.	1.5
Alaska	**The Cold Climate Housing Research Center (CCHRC)**, which represents 1,200 building industry organizations in Alaska and has a staff of 26, conducts applied research, development, and demonstration on sustainable, energy-efficient and healthy buildings. The Center's Research and Testing Facility first opened in 2006 after receiving $5.2 million in public and private funding. The Alaska Energy Authority (AEA) oversees the **Emerging Energy Technology Fund (EETF)**, which concentrates heavily on energy efficiency technologies. The Fund provides grants to entities that perform research to develop or improve energy-efficient technologies.	1

State	Major R&D Programs	Score
Arizona	The **Sustainable Energy Solutions (SES) Group of Northern Arizona State** provides research, development, and demonstration of new as well as improved energy technologies and systems, including those focused on efficiency. The Group is funded by the Arizona Technology Research and Initiative Fund as well as an average of $400,000 per year in external funding. **Arizona State University's LightWorks Center** is focused in part on energy efficiency, including research into solid state lighting as a way to reduce energy costs as well as the interaction of human behavior and energy-efficient technologies.	1
Georgia	Funded in part by the Georgia Environmental Finance Authority, the **Southface Energy Institute**, with a staff of almost 50, conducts research and training on energy-efficient housing and communities. The Georgia Environmental Finance Authority collaborates with the Institute on its weatherization training and technical assistance. At the Georgia Institute of Technology, the **Brook Byers Institute for Sustainable Systems (BBISS)** focuses on engineering water and power infrastructures, and the Institute's current efficiency-based research is focused around its Sustainable Infrastructure for Energy and Water Systems (SINEWS) Project funded by the National Science Foundation. This project has secondary teams from Arizona State University and the University of Georgia.	1
Illinois	**The University of Illinois at Chicago's Energy Resources Center (ERC)** focuses on energy conservation and production technologies and assists both private and public institutions at the local and state levels by identifying opportunities for improved efficiency and reduced utility bills. The Center receives funding from the University, a variety of public and private clients, and sponsorships from Amoco Foundation, Commonwealth Edison, the Electric Power Research Institute, People's Energy Corp., and Nicor Inc.	1
Iowa	The **Iowa Energy Center** strives to advance efficiency and renewable energy within the state through research and development while providing a model for the state to decrease its dependence on imported fuels. The Iowa Energy Center receives its funding from an annual assessment on the gross intrastate revenues of all natural gas and electric utilities in Iowa. The state also partners with private companies for research and development of energy-efficient technologies through the **Iowa Economic Development Authority (IEDA)**. Through IEDA, Iowa supports $2 million in research activities in small and medium-sized companies as well as technology transfer and commercialization efforts.	1
Kansas	**Studio 804, Inc.** is a nonprofit 501(c)(3) corporation that works in partnership with the University of Kansas' School of Architecture, Design, and Planning, and is committed to the continued research and development of sustainable, affordable, and inventive building solutions. For the last 16 years, Studio 804 has pioneered new technologies and advanced construction techniques including five LEED Platinum projects, including the Sustainable Prototype in Greensburg, Kansas. Established in the 1970s at Wichita State University, the **Center for Energy Studies** researches efficient and innovative solutions for the electric power industry. It is one of thirteen university members of the Power Systems Engineering Research Center (PSERC), an organization including the Dept. of Energy, National Science Foundation, the Electric Power Research Institute, industry, and utilities.	1
Maryland	The **University of Maryland Energy Research Center (UMERC)** is dedicated to the development of energy-efficient and environmentally sustainable technologies and practices and leads one of the U.S. DOE Energy Frontier Research Centers focused on energy storage. UMERC also educates the public on matters of energy efficiency and sustainability, and focuses specifically on heating, ventilation and air condition (HVAC), combined heat and power, lighting and building efficiency, and waste heat recovery. UMERC and its affiliated faculty receive funding from the University of Maryland, U.S. DOE, and a variety of other sources based on research topic. The **Maryland Clean Energy Technology Incubator@bwtech (CETI@bwtech)** supports entrepreneurs and early stage energy efficiency and conservation businesses seeking to transition from research and development into demonstration and ultimately commercialization.	1

State	Major R&D Programs	Score
Massachusetts	**Massachusetts Energy Efficiency Partnership (MAEEP)** supports demonstration of energy efficiency technology and tools to the industrial, commercial, and institutional sectors. The MAEEP program leverages resources from U.S. DOE, the University of Massachusetts and Massachusetts Electric Utilities, NSTAR, MECO and WMECO, in partnership. **The Center for Energy Efficiency and Renewable Energy (CEERE) at the University of Massachusetts, Amherst** focuses on renewable energy resources, energy efficiency in buildings, industrial energy efficiency, and environmental technologies with unique abilities to service energy and environmental problems. The Center has 43 faculty and staff and is funded in part through U.S. DOE grants. Massachusetts is also leveraging $4.5million in grants to pilot programs to demonstrate energy-efficient technologies in the building sector.	1
Michigan	The **Michigan NextEnergy Center** is a 501(c)(3) nonprofit organization focused on energy efficiency and battery storage that leases laboratory facilities, business incubator space, and other facilities to members of the state's alternative energy industry. As part of a "renaissance Zone," businesses within the NextEnergy Center may be eligible for tax benefits in addition to the numerous tax credits the state offers alternative energy businesses. The state has also partnered with NextEnergy to test and demonstrated advanced lighting technology. **The Clean Energy Research Center (CERC) at Oakland University** in Rochester, Michigan conducts research to help deliver energy efficiency solutions, create new clean energy jobs, and develop natural resource, environmental, and economic technologies. The Center was created in March 2011, funded by an initial grant from the Michigan Department of Energy, Labor and Economic Growth, and the Energy Systems Group.	1
New Jersey	The New Jersey Commission on Science and Technology administers the **Edison Innovation Clean Energy Fund** through a Memorandum of Understanding with the New Jersey Board of Public Utilities. The Clean Energy Fund provides grants of $100,000 to $500,000 to New Jersey companies for demonstration projects and developmental and ancillary activities necessary to commercialize renewable energy and energy efficiency technologies. The **Rutgers Energy Institute (REI)** was formed in 2006 to integrate basic research with real-world applications to advance energy technologies in a variety of areas. Its efficiency research focuses on energy-saving techniques and equipment, healthier indoor air-quality systems, building material reuse, and solid waste reduction.	1
Pennsylvania	The **Energy Research Center (ERC) at Lehigh University** emphasizes research dealing with energy conversion, power generation and environmental control. The Center's research is supported by contracts and grants from government and industry. The Center also operates the Energy Liaison Program, which provides consultation and problem-solving assistance to participating companies for up to $20,000 a year. The **Indoor Environment Center (IEC) at the Penn State Institutes of Energy and the Environment (PSIEE)** conducts research, knowledge transfer, and outreach activities to support the development of indoor environments that are safer and more thermally, visually and acoustically comfortable, and that minimize the use of energy and other resources.	1
Tennessee	The **University of Tennessee** has a strong partnership with **Oak Ridge National Laboratory**, which collaborates with other state stakeholders and industry members, including the **Electric Power Research Institute**. The **University of Tennessee Research Foundation (UTRF)** also promotes the commercialization and deployment of advanced technologies, some of which are related to energy efficiency.	1
Texas	**Texas A&M's Texas Engineering Experiment Station (TEES)** includes the **Energy Systems Laboratory (ESL)**, focused on energy-related research, energy efficiency, and emissions reduction. ESL directs its efforts toward innovative energy technologies and systems and commercializing affordable results for industry, and also plays an important role in the implementation of state energy standards. TEES researches are also developing web based tools to test the energy efficiency of new homes before construction. The **University of Texas at Austin's Center for Energy and Environmental Resources (CEER)** focuses on the efficient and economical use of energy and on ensuring a cleaner environment by developing, in cooperation with industry, processes and technologies that minimize waste and conserve natural resources.	1

State	Major R&D Programs	Score
Vermont	The **Center for Energy Transformation and Innovation at the University of Vermont** is currently being constructed through a partnership between the state, Sandia National Laboratories of New Mexico, the University of Vermont, and other academic institutions. The Center will focus on sustainable energy, energy efficiency, and smart-grid technology, and is initially designed to be a three-year project. The Center is receiving starting funds of $15 million, $9 million from Sandia, $3 million from the state, and $3 million from U.S. DOE.	1
Virginia	The Tobacco Commission in Virginia has allocated $42 million to help fund Research and Development Centers in Southside and Southwest Virginia since 2007. **The Riverstone Energy Centre** focuses on modeling and simulation to support the energy technology commercialization process. The **R&D Center for Advanced Manufacturing and Energy Efficiency** supports projects in advanced manufacturing and energy efficiency. The state also offers grants to encourage collaboration between private investors and Virginia's educational institutions to conduct R&D activities in the tobacco regions of the Commonwealth.	1
Alabama	The **University of Alabama's Center for Advanced Vehicle Technologies (CAVT)** assists in the research and development of numerous transportation systems and vehicles, and has a faculty and staff of 30. Their efficiency research is primarily focused on improving powertrains as well as energy storage and fuel cells.	0.5
Hawaii	**The Hawaii Natural Energy Institute at the University of Hawai**i focuses on the development of technologies in the energy field. The Institute's work covers a wide range of research areas such as renewable energy, energy storage, energy-efficient buildings, fuel cells, grid systems, and transportation.	0.5
Idaho	**The Center for Advanced Energy Studies (CAES)** is a partnership between Idaho National Laboratory and the State of Idaho through its three public research universities: Boise State University, Idaho State University, and the University of Idaho. The Center performs research on energy efficiency as well as a variety of other issues, and receives funding from the State of Idaho, U.S. DOE, and a variety of private and public customers.	0.5
Kentucky	The **Conn Center for Renewable Energy Research (CCRER) at the University of Louisville** conducts research that increases homegrown energy sources to meet the national need while reducing energy consumption and dependence on foreign oil. The Center has over 60 faculty members at universities across the state, and has steadily been increasing its annual research expenditures from $900,000 in 2007 to $2.1 million in 2011 with the goal of reaching $5 million by 2016.	0.5
Minnesota	To help achieve the State Energy Conservation Goal on a sustained basis, the Next Generation Energy Act of 2007 created a **Conservation Applied Research and Development (CARD) Grant Program** funded through utility assessments. With $3.6 million in annual funds, the CARD Program is designed to identify new technologies or strategies to maximize energy savings, improve the effectiveness of energy conservation programs, and document the carbon dioxide reductions from energy conservation projects.	0.5
Mississippi	Under Mississippi's "Smart Business Act" a corporation collaborating with a State university for research and development purposes, including energy-related research, is eligible for a 25 percent rebate of the total research costs. The **Energy Institute (EI) at Mississippi State University** works to develop new technologies to promote energy efficiency through combined heat and power concepts and energy audits, as well as developing technology to generate renewable transportation and heating fuel from biomass.	0.5
Nevada	The **Center for Energy Research at University of Nevada-Las Vegas** engages in both energy efficiency and renewable energy research. Conventional power generation systems, energy conservation devices and systems, and environmental control issues for energy systems are of interest.	0.5
Ohio	**The Center for Energy, Sustainability, and the Environment (CESE) at Ohio State University (OSU)** conducts research in efficient energy infrastructure systems (e.g., power grid, and transportation networks), as well as "systems of energy systems" (e.g., smart micro grids, and markets).	0.5

State	Major R&D Programs	Score
Rhode Island	The **University of Rhode Island Outreach Center** established its **Sustainable Energy Program** to develop and implement locally-based solutions to global energy challenges by partnering with local, state, regional and national decision-makers, energy providers, nonprofits and the business community while training and engaging students. Within this group, there is a focus on Energy Efficiency and Technology Assessment research.	0.5
Utah	**Utah State University** has partnered with **WAVE, Inc.**, to develop an electric bus charged by wireless energy transfer between the roadway and the vehicle. This system is being deployed at Utah State University. The University also operates the **Utah House**, an energy and water efficiency demonstration facility.	0.5
Washington	**The Northwest Building Energy Technology Hub (NBETH)** is a statewide proof-of-concept center and regional test bed for building energy technology development and commercial acceleration. The State of Washington provided $5 million in state capital funds for the program.	0.5
West Virginia	The **Advanced Energy Initiative (AEI)** at West Virginia University works to achieve energy independence and to transition to more sustainable energy forms. Research projects focus on carbon capture and geologic storage, high-efficiency engines and vehicle technologies, fuel production, clean power generation and distribution, utilization of coal for clean fuels and chemicals, biomass conversion and utilization, and sustainable use of water in energy production. AEI currently has 15 staff in their Sustainable Energy program, which houses the Initiative's energy efficiency research.	0.5

Appendix H: 2012–2013 Electricity & Natural Gas Efficiency Data

State	2012 Electricity Program Savings (MWh)[1]	% of 2012 Retail Sales[2]	2012 Natural Gas Program Savings (MMTherms)[1]	% of 2011 Retail Sales[3]	2013 Electricity Program Budgets (MWh)[1]	% of 2012 Utility Revenues[2]	2013 Gas Program Budgets ($million)[1]	$ Per Residential Customer (2011)[4]
Alabama	--	--	--	--	--	--	--	--
Alaska	--	--	--	--	--	--	--	--
Arizona	1,244,884	1.66%	--	--	--	--	--	--
Arkansas	133,149	0.29%	3.3	0.44%	66.5	1.88%	--	--
California	2,296,248	0.89%	26.4	0.34%	--	--	--	--
Colorado	419,240	0.78%	4.8	0.25%	87.3	1.74%	16.5	10.0
Connecticut	322,103	1.09%	3.7	0.40%	--	--	34.0	68.7
Delaware	9,389	0.08%	0.1	0.03%	9.7	0.76%	3.2	21.1
District of Columbia	19,715	0.18%	0.0	0.02%	12.3	0.92%	3.1	21.3
Florida	--	--	--	--	--	--	--	--
Georgia	--	--	--	--	--	--	--	--
Hawaii	--	--	--	--	33.6	1.03%	--	--
Idaho	--	--	--	--	--	--	--	--
Illinois	1,300,000	0.91%	30.2	0.47%	--	--	--	--
Indiana	--	--	--	--	--	--	--	--
Iowa	--	--	8.2	0.67%	85.1	2.41%	49.1	55.6
Kansas	30,651	0.08%	0.5	0.05%	11.7	0.32%	1.2	1.4
Kentucky	208,947	0.23%	--	--	30.3	0.47%	5.6	7.4
Louisiana	--	--	--	--	--	--	--	--
Maine	157,631	1.36%	0.2	0.23%	39.7	2.91%	0.8	34.3
Maryland	738,081	1.12%	1.8	0.12%	170.5	2.43%	15.0	13.9
Massachusetts	999,679	1.83%	23.3	1.08%	507.7	6.68%	173.5	123.2
Michigan	1,164,924	1.12%	43.8	0.89%	--	--	--	--
Minnesota	809,100	1.20%	27.6	1.23%	--	--	--	--
Mississippi	--	--	--	--	--	--	--	--
Missouri	74,035	0.09%	--	--	54.6	0.78%	--	--
Montana	67,421	0.49%	1.2	0.27%	14.1	1.24%	--	--
Nebraska	86,557	0.29%	--	--	--	--	--	--
Nevada	--	--	--	--	50.5	1.61%	4.8	6.2
New Hampshire	70,525	0.65%	1.4	0.88%	--	--	--	--
New Jersey	473,332	0.62%	7.4	0.18%	354.2	3.40%	131.9	49.6
New Mexico	--	--	--	--	18.6	0.90%	--	--
New York	1,072,728	0.75%	23.2	0.33%	772.8	3.57%	65.4	15.0
North Carolina	678,603	0.53%	1.1	0.10%	135.5	1.17%	--	--

State	2012 Electricity Program Savings (MWh)[1]	% of 2012 Retail Sales[2]	2012 Natural Gas Program Savings (MMTherms)[1]	% of 2011 Retail Sales[3]	2013 Electricity Program Budgets (MWh)[1]	% of 2012 Utility Revenues[2]	2013 Gas Program Budgets ($million)[1]	$ Per Residential Customer (2011)[4]
North Dakota	--	--	--	--	--	--	--	--
Ohio	--	--	--	--	--	--	--	--
Oklahoma	93,378	0.16%	0.2	0.02%	--	--	--	--
Oregon	463,024	0.99%	5.9	0.75%	125.8	3.27%	27.0	39.2
Pennsylvania	--	--	--	--	--	--	--	--
Rhode Island	119,666	1.56%	2.3	0.81%	77.5	7.82%	19.5	86.3
South Carolina	351,925	0.45%	--	--	53.6	0.76%	--	--
South Dakota	29,475	0.25%	0.2	0.08%	6.4	0.64%	2.5	14.6
Tennessee	302,493	0.31%	--	--	55.7	0.62%	--	--
Texas	--	--	--	--	--	--	--	--
Utah	176,419	0.59%	4.8	0.42%	35.0	1.50%	22.6	27.2
Vermont	120,751	2.23%	0.8	1.29%	41.6	5.28%	2.2	56.6
Virginia	--	--	--	--	--	--	--	--
Washington	882,579	0.95%	6.6	0.45%	--	--	18.6	17.2
West Virginia	--	--	--	--	--	--	--	--
Wisconsin	649,847	0.91%	16.9	0.94%	95.6	1.34%	36.2	21.7
Wyoming	--	--	--	--	--	--	--	--

Sources and Notes: All data presented in Appendix H is draft and subject to change. Sales, revenue, and customer information used in calculations reflect most up-to-date data available. [1]Data collected through *State Scorecard* data request; [2]EIA (2013a); [3]2011 commercial and retail sales only from EIA (2013b); [4]EIA (2013b)