The 2014 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 by expanding the energy supply. In fact, however, we have 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. Efficiency saves money, drives investment across all sectors of the economy, creates jobs, and reduces the 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, many innovative policies and programs that promote energy efficiency originated in states. The *2014 State Energy Efficiency Scorecard* reflects these successes through a comprehensive analysis of state efforts to support energy efficiency.

In this eighth edition of our State Energy Efficiency Scorecard, the American Council for an Energy-Efficient Economy (ACEEE) ranks states on their policy and program efforts, and recommends ways that states can improve their energy efficiency performance in various policy areas. The State Scorecard provides an annual benchmark of the progress of state energy efficiency policies and programs. It encourages states to continue strengthening their efficiency commitments in order to promote economic growth, secure environmental benefits, and increase their communities' resilience in the face of the uncertain cost and supply of the energy resources on which they depend.

KEY FINDINGS

Massachusetts retained the top spot in the State Energy Efficiency Scorecard rankings for the fourth year in a row, having overtaken California in 2011. The state's achievement is based on its continued commitment to energy efficiency under its Green Communities Act of 2008. Among other things, the legislation has spurred greater investments in energy efficiency programs by requiring utilities to save a large and growing percentage of energy every year through efficiency measures. Massachusetts achieved electricity savings of over 2% of retail sales in 2013.

Joining Massachusetts in the top five are **California, Rhode Island, Oregon, and Vermont**. This is the first year that Rhode Island has appeared in the top five, rising notably from its sixth-place ranking in 2013. Vermont, Oregon, and Rhode Island tied for third place this year, demonstrating the continuing commitment and progress of the states in the top tier.

Connecticut, New York, Washington, Maryland, and Minnesota rounded out the top tier. All these states have made continued commitments to energy efficiency. Minnesota returns to the top ten this year after falling slightly in the rankings in 2013.

This year's most-improved states were **Arkansas, the District of Columbia, Kentucky, and Wisconsin**. Most-improved states made large strides in both points gained and overall ranking. The District of Columbia made notable progress across a number of policy areas, fueled by the District's sustainability plan, Sustainable DC, and by the ramping up of DC Sustainable Energy Utility programs. Arkansas was pushed forward by strong utility

programs. The state's budgets for electric efficiency programs increased 30% between 2012 and 2013, while electricity savings more than tripled. Wisconsin bounced back in this year's State Scorecard after a shift in efficiency administrators had caused a temporary drop in savings. The state is once again realizing consistent levels of electricity and natural gas savings. Kentucky saw an improvement in its score for transportation policies and took clear steps toward adopting and implementing a more up-to-date commercial building energy code.

Other states have also made recent progress in energy efficiency. **Nevada** scored additional points for its building codes and compliance measures. **Delaware** passed a significant energy efficiency bill in early July, laying the groundwork for customer-funded energy efficiency programs. This policy shift did not result in an improved score this year, but it will likely garner additional points in future editions of the State Scorecard as programs are implemented and regulations are finalized.

The leading states in utility-sector energy efficiency programs and policies (covered in Chapter 2) were **Rhode Island, Massachusetts**, **and Vermont**. With long records of success, all three continued to raise the bar on cost-effective programs and policies. Both Massachusetts and Rhode Island earned maximum points in this category.

Total budgets for electricity efficiency programs in 2013 reached $6.3 billion. Adding this to natural gas program budgets of $1.4 billion, we estimate total efficiency program budgets of more than $7.7 billion in 2013.

Savings from electricity efficiency programs in 2013 totaled approximately 24.3 million megawatt-hours (MWh), a 7% increase over the 2011 savings we reported last year. Gas savings for 2013 were reported at 276 million therms (MMTherms), a 19% increase over the 2011 savings reported in the last State Scorecard.

Policies setting long-term energy savings targets faced pushback this year and were actually rolled back in two states, **Indiana** and **Ohio**. Twenty-four states continue to enforce and adequately fund an energy efficiency resource standard (EERS) that drives investments in utility-sector energy efficiency programs. The states with the most aggressive savings targets include **Arizona, Massachusetts,** and **Rhode Island**.

The leading state in building energy codes and compliance (covered in Chapter 4) was **California**. Eleven states and the District of Columbia have officially adopted the latest standards for both residential and commercial buildings.

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-three states fell in the rankings this year because of substantive changes in their performance as well as changes in our methodology. **Indiana** fell the furthest, by 13 spots, due in part to state legislators' decision to roll back the state's EERS. Legislators in **Ohio**

made a similar decision to effectively eliminate EERS requirements, resulting in a fall of seven spots.

RESULTS

The *2014 State Energy Efficiency Scorecard* assesses state policies and programs that improve energy efficiency in our homes, businesses, industries, and transportation systems. It considers 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
- Combined heat and power (CHP) policies
- State government-led initiatives around energy efficiency
- Appliance and equipment standards

Figure ES1 shows states' rankings in the *2014 State Energy Efficiency Scorecard*, dividing them into five tiers for ease of comparison. It is followed by table ES1 that provides details of the scores for each state. An identical ranking for two or more states indicates a tie (e.g., Rhode Island, Vermont, and Oregon all rank third).

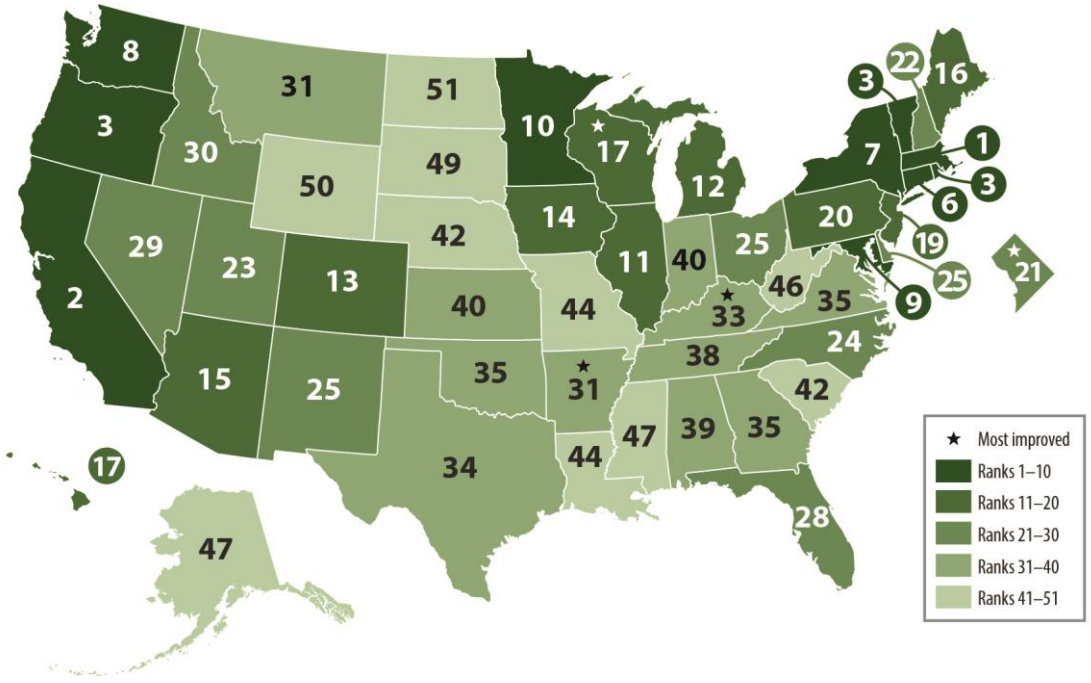

Figure ES1. 2014 State Scorecard rankings

Table ES1. Summary of state scores in the 2014 State Scorecard

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 2013	Change in score from 2013
1	Massachusetts	20	7	5.5	4.5	5	0	**42**	0	0
2	California	12.5	8.5	7	4	6.5	2	**40.5**	0	–0.5
3	Oregon	15	7	5.5	3.5	5.5	1	**37.5**	1	0.5
3	Rhode Island	20	5	6	3	3	0.5	**37.5**	3	2
3	Vermont	18.5	6	6	3	4	0	**37.5**	4	3
6	Connecticut	14	5	5	4.5	6	1	**35.5**	–1	–0.5
7	New York	13.5	8	5.5	2	6	0	**35**	–4	–3
8	Washington	13	7	6	2.5	4.5	0.5	**33.5**	0	0
9	Maryland	10.5	5	6	3	5	0.5	**30**	0	2.5
10	Minnesota	14	3.5	4.5	1.5	5.5	0	**29**	1	3.5
11	Illinois	9	5	6	1.5	5.5	0	**27**	–1	1
12	Michigan	12.5	4	3.5	1.5	4.5	0	**26**	0	1.5
13	Colorado	10.5	4	5	1	4	0	**24.5**	3	1.5
14	Iowa	12	2	6	0.5	3.5	0	**24**	–2	–0.5
15	Arizona	12	3	3	2	3	0.5	**23.5**	–3	–1
16	Maine	8	5	3.5	3	3	0	**22.5**	0	–0.5
17	Hawaii	12	3.5	2.5	1	2.5	0	**21.5**	3	1
17	Wisconsin	8.5	2.5	4	2.5	4	0	**21.5**	6	3.5
19	New Jersey	8.5	5	3	2	2.5	0	**21**	–7	–3.5
20	Pennsylvania	5	5.5	4	1	5	0	**20.5**	–1	–1.5
21	District of Columbia	5.5	5	5	1.5	2.5	0.5	**20**	9	6
22	New Hampshire	8.5	1.5	4	1.5	2.5	0.5	**18.5**	–1	–1.5
23	Utah	7	1.5	4.5	1.5	3.5	0	**18**	1	0.5
24	North Carolina	3	3.5	4	2.5	4.5	0	**17.5**	0	0
25	Delaware	1	5	6	0.5	4.5	0	**17**	–3	–1.5
25	New Mexico	7	1	4	1.5	3.5	0	**17**	–1	–0.5
25	Ohio	8	0	4	1.5	3.5	0	**17**	–7	–5.5
28	Florida	2.5	4.5	6	1	2.5	0	**16.5**	–1	1
29	Nevada	5	0.5	6	1	3.5	0	**16**	4	3
30	Idaho	4	1	5.5	0.5	3.5	0	**14.5**	1	1
31	Arkansas	8	1.5	3	0	1.5	0	**14**	6	2
31	Montana	4	0.5	6	0	3.5	0	**14**	–2	–1
33	Kentucky	3.5	1	4.5	0	4.5	0	**13.5**	6	2
34	Texas	0.5	2.5	4	1.5	4	0.5	**13**	–1	0
35	Georgia	2	4	3.5	0	2.5	0.5	**12.5**	–2	–0.5
35	Oklahoma	4	1	3.5	0.5	3.5	0	**12.5**	2	0.5
35	Virginia	0	3.5	5	0	4	0	**12.5**	1	0
38	Tennessee	2	3	2.5	0	4.5	0	**12**	–7	–1.5
39	Alabama	2.5	0.5	3.5	0	4.5	0	**11**	0	–0.5
40	Indiana	4	1	3.5	1	1	0	**10.5**	–13	–5
40	Kansas	0.5	1.5	4	0	4.5	0	**10.5**	–1	–1
42	Nebraska	1	1	5	0	3	0	**10**	2	0.5
42	South Carolina	1	2.5	3.5	0	3	0	**10**	–3	–1.5
44	Louisiana	2.5	1	3.5	0.5	1.5	0	**9**	0	–0.5
44	Missouri	3	1	2.5	0	2.5	0	**9**	–1	–1.5
46	West Virginia	0	2.5	4	1	1	0	**8.5**	0	–0.5
47	Alaska	0	2	1	0.5	4.5	0	**8**	0	0
47	Mississippi	1	0.5	3.5	0	3	0	**8**	0	0
49	South Dakota	3.5	0.5	1.5	0.5	1.5	0	**7.5**	–2	–0.5
50	Wyoming	2	1.5	1.5	0	1.5	0	**6.5**	0	1
51	North Dakota	0	1.5	1.5	0.5	0.5	0	**4**	0	0.5

We also included three U.S. territories—Puerto Rico, Guam, and the U.S. Virgin Islands—in our research this year. While we did score these territories, we did not include them in our general rankings. Though all of them have taken some steps toward ensuring that building energy codes are up to date, they have not yet invested heavily in energy efficiency in other sectors. Table ES2 shows their scores.

Table ES2. Summary of scores for territories in the 2014 State Scorecard

Territory	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.)
Puerto Rico	0	1.5	3.5	0	2	0	7
Guam	0	0	4	0	0.5	0	4.5
U.S. Virgin Islands	0	0	3.5	0	0.5	0	4

STRATEGIES FOR IMPROVING ENERGY EFFICIENCY

Put in place and adequately fund an EERS or similar energy savings target. EERS 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 catalyze increased 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 involve efficiency program administrators in code support. Buildings use more than 40% of the total energy consumed 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 the total energy used 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 states give CHP equal footing, requiring them to develop a specific methodology for

counting energy savings attributed to its utilization. If CHP is allowed as an eligible resource, EERS target levels should be increased to take into account the CHP potential and ensure that CHP does not displace traditional energy efficiency measures.

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 by expanding the energy supply. In fact, however, we have 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. Efficiency saves money, drives investment across all sectors of the economy, creates jobs, and reduces the 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, many innovative policies and programs that promote energy efficiency originated in states. The *2014 State Energy Efficiency Scorecard* reflects these successes through a comprehensive analysis of state efforts to support energy efficiency.

The State Energy Efficiency Scorecard ranks states on their policy and program efforts, not only assessing performance, but also documenting best practices, recognizing leadership, and providing examples for other states to follow. The Scorecard provides an annual benchmark of the progress of state energy efficiency policies and programs. It encourages states to continue strengthening their efficiency commitments as a pragmatic and effective strategy for promoting economic growth and environmental benefits.

The State Scorecard builds on previous research by the American Council for an Energy-Efficient Economy (ACEEE) that focused on utilities' spending on energy efficiency programs in each state and the resulting energy savings. In 2007 ACEEE consolidated this state-focused research and released *The State Energy Efficiency Scorecard for 2006*, which scored and ranked states on a number of energy efficiency policies (Eldridge et al. 2007). Given the broad interest in the 2007 report and continued demand for a state-by-state comparison of energy efficiency efforts, we have updated the report each year and now present *The 2014 State Energy Efficiency Scorecard* as its eighth 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 state-level energy efficiency trends revealed by the rankings.

Succeeding chapters present detailed results for each of the policy areas 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 state code compliance efforts. Chapter 5 scores states on policies that encourage and enable combined heat and power (CHP) development. Chapter 6 deals with state government initiatives, including financial incentives, lead-by-example policies, energy efficiency-focused research and development (R&D), and building energy use 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 and Results

Author: Annie Gilleo

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 the American Council for an Energy-Efficient Economy (ACEEE) that have identified the relative energy savings impacts from state-level policies (SWEEP 2007; Neubauer et al. 2009, 2011; Molina, Elliott, and Vaidyanathan 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 50 total possible points, or 20 points, to utility and public benefits program and policy metrics; about 15% of the points, or 7 points, to building energy codes; and 10%, or 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 collected on customers' bills.

Table 1. Scoring by policy area and categories

Policy category and 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	2	4%
Annual savings from electricity efficiency programs	5	10%
Annual savings from natural gas efficiency programs	2	4%
Large customer opt-out programs*	(–1)	NA
Energy efficiency resource standards (EERSs)	3	6%
Performance incentives and fixed cost recovery	3	6%
Transportation policies	9	18%
Greenhouse gas (GHG) tailpipe emissions standards	1.5	3%
Electric vehicle (EV) registrations	0.5	1%
Integration of transportation and land use planning	1	2%
Freight plans and energy efficiency targets	1	2%
Targets to reduce vehicle miles traveled	1	2%
Change in vehicle miles traveled	1	2%
Transit funding	1	2%
Transit legislation	0.5	1%
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 EERS	1	2%
Treatment under renewable portfolio standard (RPS)	0.5	1%
Revenue streams	0.5	1%
Incentives and grants	0.5	1%
Financing assistance	0.5	1%
Emissions treatment	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%**

* Large customer opt-out programs allow a class of customers to withdraw from contributing to funding the program and contributing savings to the overall program, reducing the potential savings available, so we deduct points for these policies.

Within each policy area, we developed a scoring methodology based on a diverse set of criteria that are 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 *2014 State Energy Efficiency Scorecard* is accurate as of the end of August 2014.

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 policy and program landscape. As new studies of the potential of energy efficiency 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, we made several changes in order to better reflect the most up-to-date policy environment throughout the United States. We continued to score states on savings for electricity and natural gas programs, but attempted to decrease the data lag. In previous years, there was a two-year lag in savings data. This year, we worked to gather data for 2013 savings. Where these were not available, we did rely on 2012 savings data, but for most states the data lag was significantly decreased. We also found that this year states continued to raise the bar on electricity savings, and we increased the rigor of our scoring to recognize those states that are achieving electricity savings greater than 2% of retail sales. The State Scorecard is designed to reflect those states that are pushing themselves to improve each year. As states better understand the benefits of energy efficiency investments and how to most cost-effectively achieve savings, they dedicate more resources to efficiency programs.

Last year, we scored states for the first time on natural gas savings. We continued to score on that metric this year, increasing the number of points states could earn for achieving and reporting natural gas savings. Though data on these programs are not yet comprehensive, natural gas programs make up a growing portion of efficiency portfolios. We rely on state contacts for this point of data, and while we did not receive a comprehensive set of responses to our request for natural gas savings information, we nonetheless believe the metric to be a valuable indicator of energy efficiency progress within each state.

Additionally, for the first time we included a metric worth negative points in Chapter 2. The past year has seen a rise in the push by large customers to completely opt out of energy efficiency programs. Investments in energy efficiency benefit all customers, and by allowing large customers to completely opt out of efficiency programs, states not only limit the available cost-effective efficiency measures, but also allow large customers to unfairly benefit from investments in efficiency while other customers shoulder the costs. To reflect

this negative trend, we subtracted 1 point from states that allow large customers to opt out of efficiency programs completely without demonstrating equivalent investments in energy efficiency.

This year, we also introduced new metrics to Chapter 3, Transportation Policies. In 2013, we solicited comments on several proposed metrics. Based on feedback from state agencies and regional organizations, we included two of these metrics for the first time this year. States with a significant number of EV registrations per 100,000 people were awarded 0.5 points. To place a greater emphasis on policy outcomes, we also awarded up to 1 point to states based on reductions in vehicle miles traveled over a five-year period. The transportation section also included a metric based on state freight plans for the first time. In 2012, the U.S. Department of Transportation (DOT) began to require that states put freight transportation plans in place in order to be eligible for a federal match on freight projects. We award up to 1 point to states that include energy efficiency performance metrics within these plans.

We made slight adjustments to our scoring criteria for building energy codes in Chapter 4 to reflect both ACEEE's increased efforts to collect data on compliance activities and the national requirement that states achieve 90% compliance with codes mandated by the American Recovery and Reinvestment Act (ARRA) by 2017. As in the past, 5 points were allocated for building code stringency and 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 a slight change from last year, a state must have completed a compliance study in order to receive 1 of those 2 points.

In Chapter 5, Combined Heat and Power, some slight adjustments were made to scoring. While no metrics were added in this section, some points were shifted as we combined certain metrics and separated others. In order to emphasize CHP's importance in energy efficiency standards, its treatment under EERS and RPS policies was considered separately. This year, we also considered a variety of revenue streams that enable CHP development, including wholesale net metering, feed-in tariffs, and other standard offer programs that incentivize CHP.

Finally, in an important step forward, three U.S. territories are included in this year's State Scorecard for the first time: Guam, Puerto Rico, and the U.S. Virgin Islands. In general, data are not publicly available for the territories to the extent that they are for states. We worked closely with contacts at energy offices in these three territories to fill in data gaps, and we scored the territories based on the same criteria we used to score states. We did not include territories in our overall rankings, however.

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 the customer-funded energy efficiency programs presented in Chapter 2. Forty-six state commissions responded, an improvement over the 43 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 53 state and territory energy offices, a record number. In addition, state energy office and utility commission officials were given the opportunity to review and submit updates to the material on ACEEE's State and Local Policy Database (ACEEE 2014). These state officials were also given the opportunity to review and provide comments on a draft of the *2014 State Energy Efficiency Scorecard* prior to publication.

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 [IOUs] 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 adoption of building codes, local land use policies, and state financial incentives aimed at local energy efficiency efforts. We also include municipal utilities in our data set to the extent that they report energy efficiency data to the U.S. Energy Information Administration (EIA). 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 biennial *City Energy Efficiency Scorecard* (Mackres et al. 2013).

Private-sector investments in efficient technologies outside of customer-funded or government-sponsored energy efficiency programs also are 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 spanning 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.

While our preference is to include metrics based on energy savings achieved in every sector, these data are not widely available. Therefore, 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. Instead, we have developed best practice metrics for scoring 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 generally relied on best practice metrics. To the extent

possible, we have also attempted to reflect outcome metrics; for example, EV registrations and reductions in vehicle miles traveled are both meant to reflect positive outcomes of transportation policies. Full discussions of the policy and performance metrics used can be found in each chapter.

2014 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 highlight some key 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.

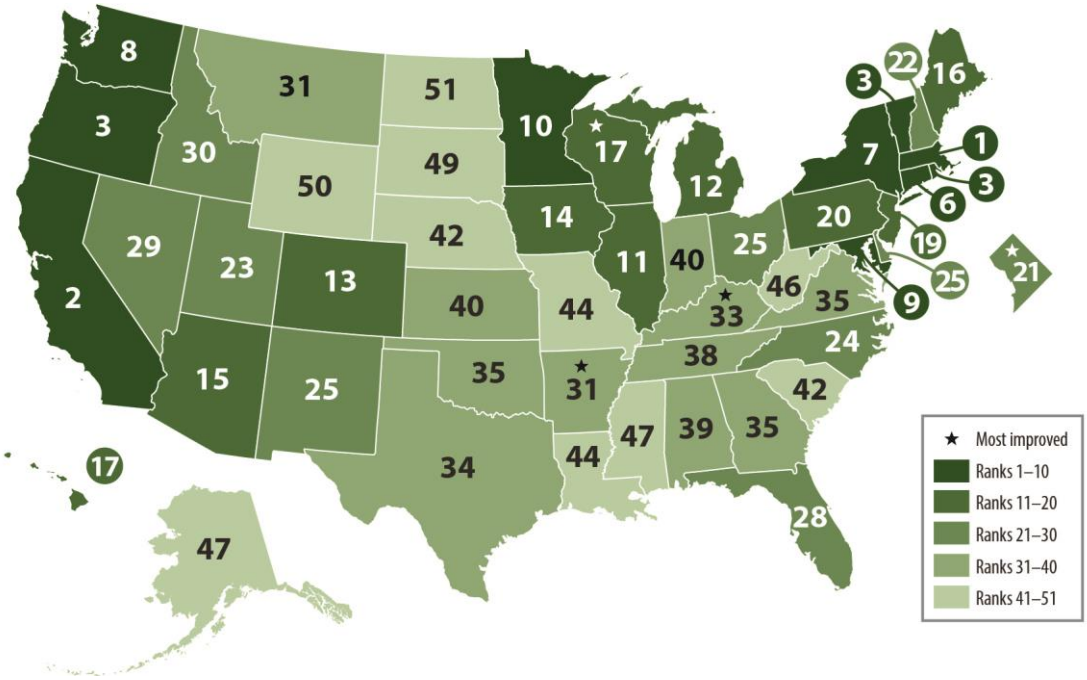

Figure 1. 2014 State Scorecard rankings map

Table 2. Summary of state scores in the 2014 State Scorecard

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 2013	Change in score from 2013
1	Massachusetts	20	7	5.5	4.5	5	0	**42**	0	0
2	California	12.5	8.5	7	4	6.5	2	**40.5**	0	–0.5
3	Oregon	15	7	5.5	3.5	5.5	1	**37.5**	1	0.5
3	Rhode Island	20	5	6	3	3	0.5	**37.5**	3	2
3	Vermont	18.5	6	6	3	4	0	**37.5**	4	3
6	Connecticut	14	5	5	4.5	6	1	**35.5**	–1	–0.5
7	New York	13.5	8	5.5	2	6	0	**35**	–4	–3
8	Washington	13	7	6	2.5	4.5	0.5	**33.5**	0	0
9	Maryland	10.5	5	6	3	5	0.5	**30**	0	2.5
10	Minnesota	14	3.5	4.5	1.5	5.5	0	**29**	1	3.5
11	Illinois	9	5	6	1.5	5.5	0	**27**	–1	1
12	Michigan	12.5	4	3.5	1.5	4.5	0	**26**	0	1.5
13	Colorado	10.5	4	5	1	4	0	**24.5**	3	1.5
14	Iowa	12	2	6	0.5	3.5	0	**24**	–2	–0.5
15	Arizona	12	3	3	2	3	0.5	**23.5**	–3	–1
16	Maine	8	5	3.5	3	3	0	**22.5**	0	–0.5
17	Hawaii	12	3.5	2.5	1	2.5	0	**21.5**	3	1
17	Wisconsin	8.5	2.5	4	2.5	4	0	**21.5**	6	3.5
19	New Jersey	8.5	5	3	2	2.5	0	**21**	–7	–3.5
20	Pennsylvania	5	5.5	4	1	5	0	**20.5**	–1	–1.5
21	District of Columbia	5.5	5	5	1.5	2.5	0.5	**20**	9	6
22	New Hampshire	8.5	1.5	4	1.5	2.5	0.5	**18.5**	–1	–1.5
23	Utah	7	1.5	4.5	1.5	3.5	0	**18**	1	0.5
24	North Carolina	3	3.5	4	2.5	4.5	0	**17.5**	0	0
25	Delaware	1	5	6	0.5	4.5	0	**17**	–3	–1.5
25	New Mexico	7	1	4	1.5	3.5	0	**17**	–1	–0.5
25	Ohio	8	0	4	1.5	3.5	0	**17**	–7	–5.5
28	Florida	2.5	4.5	6	1	2.5	0	**16.5**	–1	1
29	Nevada	5	0.5	6	1	3.5	0	**16**	4	3
30	Idaho	4	1	5.5	0.5	3.5	0	**14.5**	1	1
31	Arkansas	8	1.5	3	0	1.5	0	**14**	6	2
31	Montana	4	0.5	6	0	3.5	0	**14**	–2	–1
33	Kentucky	3.5	1	4.5	0	4.5	0	**13.5**	6	2
34	Texas	0.5	2.5	4	1.5	4	0.5	**13**	–1	0
35	Georgia	2	4	3.5	0	2.5	0.5	**12.5**	–2	–0.5
35	Oklahoma	4	1	3.5	0.5	3.5	0	**12.5**	2	0.5
35	Virginia	0	3.5	5	0	4	0	**12.5**	1	0
38	Tennessee	2	3	2.5	0	4.5	0	**12**	–7	–1.5
39	Alabama	2.5	0.5	3.5	0	4.5	0	**11**	0	–0.5
40	Indiana	4	1	3.5	1	1	0	**10.5**	–13	–5
40	Kansas	0.5	1.5	4	0	4.5	0	**10.5**	–1	–1
42	Nebraska	1	1	5	0	3	0	**10**	2	0.5
42	South Carolina	1	2.5	3.5	0	3	0	**10**	–3	–1.5
44	Louisiana	2.5	1	3.5	0.5	1.5	0	**9**	0	–0.5
44	Missouri	3	1	2.5	0	2.5	0	**9**	–1	–1.5
46	West Virginia	0	2.5	4	1	1	0	**8.5**	0	–0.5
47	Alaska	0	2	1	0.5	4.5	0	**8**	0	0
47	Mississippi	1	0.5	3.5	0	3	0	**8**	0	0
49	South Dakota	3.5	0.5	1.5	0.5	1.5	0	**7.5**	–2	–0.5
50	Wyoming	2	1.5	1.5	0	1.5	0	**6.5**	0	1
51	North Dakota	0	1.5	1.5	0.5	0.5	0	**4**	0	0.5

How to Interpret Results

Although we provide individual state scores and rankings, the differences between states are most instructive in tiers of 10. The difference between states' total scores in the middle tiers of the State Scorecard is small: only 6.5 points separate the states in the second tier, 4 points in the third tier, and 3.5 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 13-point range), representing more than one-third of the total variation in scoring among all the states. Massachusetts and California continued to score higher than other states and retained their spots at the top, despite our several methodological changes this year. However, other states in the top tier are quickly closing the gap, as evidenced by the three-way tie for third place. All of these states have made broad, long-term commitments to energy efficiency, indicated by their having remained at the top of the State Scorecard over the past eight years. Notably, the top tier did see some significant movement this year, with Rhode Island moving from sixth place to third and Vermont moving up four places to tie Rhode Island and Oregon. New York fell out of the top four for the first time since 2009. Details on leading states are discussed further below.

We did not rank the three territories we included in our research this year, although we did score them in all the categories. In general, territories scored near the bottom, largely because their publicly owned utilities do not offer energy efficiency programs. Though all three territories we reviewed have taken some steps toward ensuring building energy codes are up to date, they have not invested heavily in energy efficiency in other sectors. Scores for Puerto Rico, Guam, and the U.S. Virgin Islands are given in table 3.

Table 3. Summary of scores for territories in the 2014 State Scorecard

Territory	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.)
Puerto Rico	0	2	3.5	0	2	0	7.5
Guam	0	0	4	0	0.5	0	4.5
U.S. Virgin Islands	0	0	3.5	0	0.5	0	4

2014 Leading States

Massachusetts retained the top spot in the State Energy Efficiency Scorecard rankings for the fourth 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, resulting in Massachusetts achieving net savings of over 2% of electricity sales in 2013 and attaining a perfect score for its utilities policies and programs in 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 leading state, following closely behind Massachusetts. California was the only state to receive full points for its building energy codes, and it also scores highest for its transportation policies and state-led efficiency initiatives. Rhode Island, Vermont, and Oregon rose notably in the State Scorecard this year, tying for third place. Rhode Island was the only state besides Massachusetts to receive a perfect score for its utilities policies and programs. Connecticut, New York, and Washington were each separated by 2 points or less, showing that the top 10 is increasingly dynamic, with many states having the potential to achieve the top rank. Continuous improvement is needed even in top-ranking states to maintain a spot among the top 10.

Table 4 shows the number of years that states have been in the top 5 and top 10 spots in the State Scorecard rankings since 2007. In total, 7 states have occupied the top 5 spots, and 14 have appeared somewhere in the top 10. California and Oregon are the only states to have held a spot among the top five in all eight years, followed by Massachusetts for seven years, New York and Vermont for six years, and Connecticut for four. Rhode Island holds a spot among the top five this year for the first time. Rounding out the top 10 are Washington, which has been included in that tier in all eight years; Maryland, for four years; and Minnesota, which earned a top-10 spot for the seventh time this year after falling out of the tier in 2013. Though New Jersey, Wisconsin, Illinois, and Maine have all placed in the top 10 in the past, none scored highly enough to be ranked in the top tier this year. Nonetheless, 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 and Maine; among other actions, they have not allocated budgets for energy efficiency at the same levels as in the past. In 2013, Maine reauthorized and expanded funding for its energy efficiency programs, pushing it significantly higher in the rankings, although not high enough to put it in the top 10. Wisconsin fell in the rankings due to a dip in the savings it achieved in 2011, but it is also seeing improvements in the outcomes of its efficiency programs as a period of program administrator turnover comes to an end.

Table 4. Leading states in the State Scorecard, by years at the top

State	Years in top 5	Years in top 10
California	8	8
Oregon	8	8
Massachusetts	7	8
New York	6	8
Vermont	6	8
Connecticut	4	8
Rhode Island	1	7
Washington	0	8
Minnesota	0	7
Maryland	0	4
Maine	0	2
New Jersey	0	2
Wisconsin	0	1
Illinois	0	1

Changes in Results Compared to the *2013 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 5 presents the results of the *2014 State Energy Efficiency Scorecard* compared to last year, by policy area and direction of change. Overall, 16 states gained points and 21 states lost points compared to last year, with 14 states having no change in score.[2] Many of these changes in points awarded are due to our 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 best-performing state for four years in a row, continued to push its energy efficiency policies and programs forward, but nonetheless did not earn additional points. This does not reflect stagnation in effort or outcome. Rather, we raised the bar and awarded points for more ambitious programs and policies, particularly in natural gas and electricity savings.

[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. This year, we have also scored three territories for the first time.

Table 5. Number of states gaining or losing points compared to 2013, by policy

Policy category	States gaining points		No change		States losing points	
Utility and public benefits	10	20%	21	41%	20	39%
Transportation	33	65%	8	16%	10	20%
Building energy codes	18	35%	19	37%	14	27%
Combined heat and power	13	25%	16	31%	22	43%
State government initiatives	9	18%	21	41%	21	41%
Appliance standards	0	0%	51	100%	0	0%
Total score	16	31%	14	27%	21	41%

Percentages may not total 100 due to rounding.

The landscape for energy efficiency is clearly in constant flux and many opportunities remain for states to lead the way. Last year, we made significant changes to the stringency of scoring for utility policies and programs. This year, we again raised the bar 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 in utility policies and programs over the past year. Budgets for both electricity and natural gas increased in 2013. Two states achieved electricity savings of over 2% of sales while several others hovered near the 2% mark, demonstrating the significant savings available when programs are well funded and well directed. Savings from electric efficiency programs in 2013 totaled approximately 24.3 million megawatt-hours (MWh), a 7% increase over the savings total in last year's State Scorecard, which used 2011 data.[3]

This year, 20 states lost points in Chapter 2, Utility and Public Benefits Programs and Policies, while only 10 gained points. This overall decrease in points awarded does not necessarily 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 once again increased the savings levels required per point earned for utility energy efficiency program 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 multiyear plans suggest that more states will receive full points in the future as their efficiency programs expand. State scores may also have been affected by methodology changes in other chapters.

[3] Note that in the 2013 State Scorecard, we reported 2011 savings, while in this year's State Scorecard we report the most recent savings data available. For several states where 2013 data were not available, we report 2012 savings.

Most-Improved States

Sixteen 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 its points (reflecting its efforts this year relative to last) as well as rank (reflecting its efforts relative to other states) compared to those results in the *2013 State Energy Efficiency Scorecard*. We summed changes in these two categories to determine which states had truly improved over the past year.

This year's most-improved states were the District of Columbia, Wisconsin, Arkansas, and Kentucky. All four made significant jumps in rank in addition to increases in score.

Table 6. Changes from 2013 for most-improved states

	Change in score	Change in rank	2014 ranking
District of Columbia	+6	+9	21
Wisconsin	+3.5	+6	17
Arkansas	+2	+6	31
Kentucky	+2	+6	33

Though the State Scorecard places significant emphasis on utility-sector programs and policies, these states have made strides in many policy areas. The District of Columbia in particular made notable progress, increasing its scores for its utility programs, transportation policies, building codes, and CHP policies and incentives. Both the ramping up of programs by the D.C. Sustainable Energy Utility and the policies emphasized in the District's sustainability plan, Sustainable D.C., contributed to this major rise in the rankings.

Arkansas also made notable progress over the past year, pushed forward by strong utility programs. Budgets for electric efficiency programs increased 30% between 2012 and 2013, while electricity savings more than tripled. Arkansas is the first state in the Southeast to adopt an EERS, and as a result the state is beginning to realize meaningful energy savings.

Wisconsin bounced back in this year's State Scorecard after a shift in efficiency administrators had caused a temporary drop in savings. With Focus on Energy back on track, the state is once again realizing consistent levels of electricity and natural gas savings. Though budgets for these programs remained about the same, electricity savings increased by more than 30%.

Kentucky saw an improvement in the transportation category due to reductions in vehicle miles traveled and inclusion of energy efficiency measures within its state freight plan. The state has also made clear steps toward the adoption and implementation of a more up-to-date commercial building energy code.

Other states have also made recent efforts related to energy efficiency. Vermont saw a notable rise in the rankings due to its strong performance in the utilities sector and its ongoing adoption of more-stringent building energy codes. Nevada also scored additional points for its building codes and compliance measures. Rhode Island continues to reap the

benefits of its EERS policies, and this year both Rhode Island and Massachusetts reported net electricity savings of over 2% of sales. Delaware also passed a significant energy efficiency bill in early July, laying the groundwork for customer-funded energy efficiency programs.

States Losing Ground

Twenty-three states lost points this year due to a number of factors including changes to the scoring methodology in several of our policy areas (utilities, transportation, CHP, and building codes) and relatively faster progress by other states. Here we can see the complex relationship between changes in total score and changes in rank. Of the 23 states that lost points, 18 fell in the rankings. The rankings of five others did not change. Meanwhile, Texas saw no change in points but 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.

However, two states lost significant ground this year due to rollbacks of important energy efficiency policies. Legislatures in both Ohio and Indiana voted to remove EERS policies in 2014. These policy rollbacks are clearly reflected in their scores, as shown in table 7.

Table 7. Changes from 2013 for states losing ground

State	Change in score	Change in rank	2014 ranking
Ohio	–5.5	–7	25
Indiana	–5	–13	40

Indiana fell the farthest in this year's State Scorecard, dropping 13 positions compared to last year. This was largely due to the repeal of its EERS, although the state also lost points in transportation and state government initiatives. Despite the state legislature's decision to terminate Energizing Indiana, there is some hope that efficiency programs may be revitalized under new legislation. Though the bill was passed into law, it was never signed by the state's governor, who indicated that he would call on the Indiana Utility Regulatory Commission to develop a new energy efficiency program in the coming years.

Ohio's ranking dropped for similar reasons. In June, the legislature passed, and Governor John Kasich signed, SB 310, freezing the state's energy efficiency standards. Ohio lost points in the utilities section of the State Scorecard as a result. Utilities within the state may continue implementing energy efficiency programs, but with no targets to guide progress, it is unlikely that the state will continue to realize similarly high levels of energy savings in the future.

Several other states also fell backward in the rankings. New Jersey and Tennessee dropped seven rankings, while New York dropped four. Tennessee lost points as a result of methodology changes, and points were also removed from the state's CHP score since its

interconnection standard does not apply to CHP. New Jersey's lead-by-example initiatives were reassessed this year, and the state failed to earn points for benchmarking requirements for public buildings. New Jersey also lost points due to failure to report building code compliance activities in the most recent year. New York's rank fell in large part due to the aggressive efficiency efforts of other leading states, but the state also achieved slightly lower levels of energy savings than in past years. New York's EERS goals were also reassessed, leading to a slightly lower score in that category. The state is currently undergoing a large-scale reorganization of its utility policies and programs, so movement in either direction is possible in coming years.

STRATEGIES FOR IMPROVING ENERGY EFFICIENCY

No state received the full 50 points in the *2014 State Energy Efficiency Scorecard*, reflecting the fact that there is 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 based on the metrics we track.

Put in place, and adequately fund, an EERS 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 also 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. EERS targets should be established through rigorous, robust integrated resources planning. 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, Rhode Island

Adopt updated, more-stringent building energy codes, improve code compliance, and enable efficiency program administrators to be involved in code support. Buildings consume more than 40% of the total energy used 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 their level of implementation allows, 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 the enabling of utility and program administrators to be involved 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 the total energy used 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 ensure continuing progress on federal fuel economy standards. Codifying targets for reducing vehicle miles traveled (VMT) is an important step toward states' achieving substantial reductions in energy use and levels of certain pollutants. See Chapter 3 for further details.

Examples: California, New York, Massachusetts, Oregon

Treat CHP as an energy efficiency resource equivalent to other forms of energy efficiency. Several states list CHP as an eligible technology within their EERS or RPS, 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 states to develop a specific methodology for counting CHP savings. If CHP is considered an eligible resource, target levels should take into account CHP potential. Massachusetts has accomplished this in its 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

Authors: Annie Gilleo and Seth Nowak

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.[4] Utility customers fund these programs, either through utility rates or statewide public benefits funds. Driven by regulation from state utility commissions, utilities and independent statewide program administrators in some states have been delivering energy efficiency programs for decades, offering various efficiency services for residential, commercial, industrial, and low-income customers.[5] Today, utilities and third-party efficiency administrators in all 50 states and the District of Columbia implement energy efficiency programs.[6] Utilities' approaches to delivering energy efficiency may include financial incentives such as rebates and loans; technical services such as audits, retrofits, and training for architects, engineers, and building owners; 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 seven 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[7]
- Incremental natural gas program savings as a percentage of residential and commercial sales
- States' enabling policies, such as EERSs
- Opt-out provisions for large customers
- 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

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

[5] 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 Electric Utility Energy Efficiency Activity in the States* (York et al. 2012).

[6] The three territories surveyed this year did not report savings from ratepayer-funded programs.

[7] 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.

efforts.[8] In the 1980s and 1990s, such programs were almost exclusively the domain of utilities, which administered and implemented programs under regulatory oversight.

Efforts in the mid-1990s to restructure and deregulate the electric utility markets led numerous states to implement 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). These programs are usually administered by utilities, but in several states separate efficiency utilities or other third parties may administer programs.[9] 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 administrators 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.[10] 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 are placing renewed focus and importance on energy efficiency programs. From its low point in 1998, spending for electricity programs increased fivefold by 2010, from approximately $900 million to $4.6 billion. And in 2013, total budgets for electricity efficiency programs reached nearly $6.3 billion. Adding this to natural gas program budgets of $1.4 billion, we estimate total efficiency program budgets of more than $7.7 billion in 2013 (see figure 2).

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[8] 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 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.

[9] 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.

[10] 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 due to 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. For more on this issue, see York and Kushler (2011).

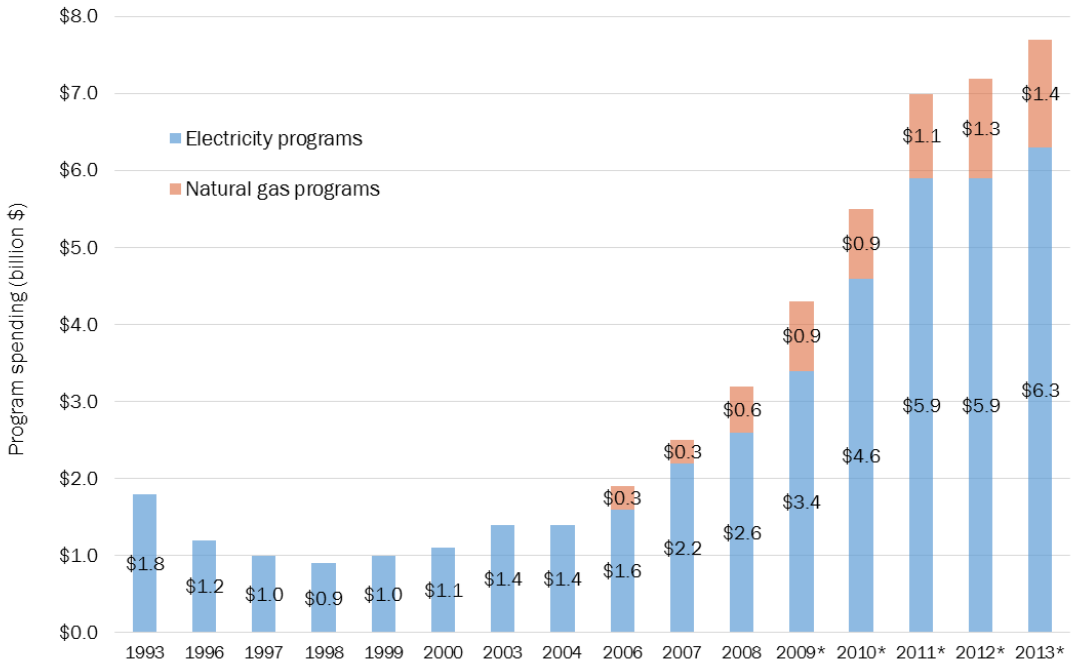

Figure 2. Annual electric and natural gas energy efficiency program spending or budgets. *From 1993 to 2008, values represent actual program spending (including customer-funded programs); from 2009 on, they represent program budgets. Natural gas spending is not available for the years 1993–2004. *Sources:* Nadel, Kubo, and Geller 2000; York and Kushler 2002, 2005; Eldridge et al. 2008, 2009; Molina et al. 2010; Sciortino et al. 2011; Foster et al. 2012; Downs et al. 2013.

Given states' increasing commitments to energy efficiency, this growth will likely continue over the next decade, albeit at a slower rate. In one recent analysis of customer-funded energy efficiency program budgets, funding for electric and natural gas programs is estimated to rise 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). This analysis also suggests a significant broadening of the U.S. energy efficiency market, with a large portion of the projected increases in spending coming from states in the Southeast that historically have had relatively low levels of funding for energy efficiency.

Furthermore, many states are likely to rely heavily on energy efficiency to meet new Environmental Protection Agency (EPA) Clean Power Plan rules for carbon emissions in existing power plants (EPA 2014a). While states have only just begun to assess potential pathways for meeting the GHG regulations outlined under section 111(d) of the Clean Air Act, a study by ACEEE found that rapidly deployable energy efficiency policies can yield a 26% reduction in GHG emissions overall (Hayes et al. 2014). As state plans to meet 111(d) requirements become more concrete over the next several years, it is likely that spending on energy efficiency will continue to rise.

Savings from Electric Efficiency Programs

We assessed the overall performance of electricity energy efficiency programs by the reported amount of electricity saved. Utilities and non-utility program administrators pursue numerous strategies to achieve energy efficiency savings. Program portfolios may initially concentrate on low-hanging fruit like 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 result 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 semiannual or annual basis.

In states ramping up funding levels in response to aggressive EERS policies, 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 conducting whole-building or system retrofits. Some deep-savings approaches also draw on complementary efficiency efforts, such as the enforcement of building energy codes.[11] 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.

Programs for Large Customers

For the first time this year, we assessed opt-out and self-direct provisions for large customers. Increasingly, some large customers are seeking to opt out of utility energy efficiency programs. They assert that they have already done all the energy efficiency that is cost-effective; however, this is seldom the case (Chittum 2011). This situation arises from capital allocation decisions (e.g., very-short-term payback requirements) that leave many energy efficiency opportunities on the table. Significant cost-effective energy efficiency opportunities exist if the funds are available.

Failure to include large customer programs in an energy efficiency portfolio will increase the cost of the resource for all customers and reduce the benefits. In effect, allowing the large customers to opt out forces other consumers to subsidize them. While the ideal solution is for utilities to offer programs that are responsive to the needs of these large consumers, ACEEE's research suggests that this does not always happen (Chittum 2011). In those cases, we suggest giving these customers the option of self-directing their energy efficiency program dollars.[12] This option provides a path for including large customer energy efficiency in the state's portfolio of savings at the same time as it encourages utilities to improve program offerings to become more responsive to all customers' needs.

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[11] See Nowak et al. (2011) for a full discussion of this topic.

[12] Self-direct programs allow some customers, usually large industrial or commercial ones, to self-direct energy efficiency fees usually paid on utility bills directly into energy efficiency investments in their facilities instead of into a broader aggregated pool of funds. These programs should be designed to include comparable methods for verification and measurement of investments and energy savings.

Energy Efficiency Resource Standards

Enabling policies such as EERSs and 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-four states now have fully funded EERS policies that establish specific energy savings targets that utilities or independent statewide program administrators must meet through customer energy efficiency programs.[13] These policies set multiyear targets for electricity or natural gas savings, such as 1% or 2% incremental savings per year or 20% cumulative savings by 2025.[14]

EERS policies differ from state to state, but each has the intent of establishing a sustainable, long-term role for energy efficiency in the state's overall energy portfolio. ACEEE considers a state to have an EERS if it has a policy in place that

1. Sets clear long-term targets for electricity or natural gas savings
2. Makes it clear that targets are mandatory
3. Includes sufficient funding for full implementation of programs necessary to meet targets

Several states have chosen to enforce all cost-effective efficiency requirements, which require utilities and program administrators to determine and invest in the maximum amount of cost-effective efficiency feasible. ACEEE considers states with all cost-effective requirements to have EERS policies in place once these policies have led to multiyear savings targets.

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, with the goals 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.[15]

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[13] In last year's State Scorecard, we reported that 26 states had EERS policies in place. However the Ohio and Indiana legislatures rolled back EERS policies in 2014.

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

[15] The ACEEE report *Energy Efficiency Resource Standards: A New 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 (Downs and Cui 2014).

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 the 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 these revenues either through a lost-revenue adjustment mechanism (LRAM) or other ratemaking approach. ACEEE considers decoupling to be the preferred approach for addressing the throughput incentive, and LRAMs to be the 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 may 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 21.

METHODOLOGY AND 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). However, natural gas programs are beginning to constitute more meaningful portions of energy efficiency portfolios. Therefore we allocated 10 points to performance metrics for electricity programs (annual budgets and savings data) and 4 points to performance metrics for natural gas programs (annual budgets

and savings data). We also scored states on a variety of enabling policies. 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 2012 and 2013
- Utility revenues from sales to end users in 2012 and 2013
- Number of residential natural gas customers in 2012
- Budgets for electricity and natural gas energy efficiency programs in 2013
- Actual spending on electricity and natural gas energy efficiency programs in 2012
- Incremental savings from electricity and natural gas energy efficiency programs in 2012 and 2013
- Policies to encourage utility investment in energy efficiency
- Utility policies and programs related to large customers, including self-direct and opt-out provisions

Table 8. Summary of state scoring on utility and public benefits programs and policies

State	2013 electricity program budgets (5 pts.)	2013 natural gas program budgets (2 pts.)	2013* electricity program savings (5 pts.)	2013 natural gas program savings (2 pts.)	Opt-out provision (–1 pt.)	Energy efficiency resource standard (3 pts.)	Performance incentives & fixed cost recovery (3 pts.)	Total score (20 pts.)
Massachusetts	5	2	5	2	0	3	3	20
Rhode Island	5	2	5	2	0	3	3	20
Vermont	5	2	4	2	0	3	2.5	18.5
Oregon	5	1.5	3.5	1	0	2.5	1.5	15
Connecticut	4	1.5	2	1	0	2.5	3	14
Minnesota	3	1	2.5	2	0	3	2.5	14
New York	3	2	2.5	0.5	0	2.5	3	13.5
Washington	5	0.5	3	1	0	2	1.5	13
California	3.5	1	3	0.5	0	1.5	3	12.5
Michigan	1.5	1	3.5	2	0	2	2.5	12.5
Arizona	2	0.5	4	0.5	0	3	2	12
Hawaii	1	0.5	4	1.5	0	2	3	12
Iowa	3.5	2	2.5	1.5	0	2.5	0	12
Colorado	2	0.5	2	0.5	0	3	2.5	10.5
Maryland	3.5	0.5	2	0	0	3	1.5	10.5
Illinois	3	1	2	1	0	1	1	9
New Hampshire	2.5	2	1	1.5	0	0	1.5	8.5
New Jersey	4.5	2	1	0	0	0	1	8.5
Wisconsin	1	0.5	2	1.5	0	1	2.5	8.5
Arkansas	2	1	1	1	-1	1.5	2.5	8
Maine	3	1.5	1.5	0	-1	3	0	8

State	2013 electricity program budgets (5 pts.)	2013 natural gas program budgets (2 pts.)	2013* electricity program savings (5 pts.)	2013 natural gas program savings (2 pts.)	Opt-out provision (–1 pt.)	Energy efficiency resource standard (3 pts.)	Performance incentives & fixed cost recovery (3 pts.)	Total score (20 pts.)
Ohio	1.5	2	2	0	0	0	2.5	8
New Mexico	1	0.5	1	0	0	2	2.5	7
Utah	1.5	1.5	2	1	0	0	1	7
District of Columbia	1	1	1	0	0	0	2.5	5.5
Nevada	1.5	0.5	2	0	0	0	1	5
Pennsylvania	2	0.5	2	0	0	0.5	0	5
Idaho	2.5	0	1.5	0	0	0	0	4
Indiana	1	0.5	1	0.5	-1	0	2	4
Montana	1.5	0	1.5	0	0	0	1	4
Oklahoma	1	0.5	0.5	0.5	-1	0	2.5	4
Kentucky	0.5	0	1	0.5	-1	0	2.5	3.5
South Dakota	0.5	0.5	0	0	0	0	2.5	3.5
Missouri	0.5	0.5	1	0	-1	0	2	3
North Carolina	0.5	0	1	0	-1	0	2.5	3
Alabama	0	0	0	0	0	0	2.5	2.5
Florida	1	1	0.5	0	0	0	0	2.5
Louisiana	0	0	0	0	0	0	2.5	2.5
Georgia	0	0	0.5	0	0	0	1.5	2
Tennessee	1	0	0.5	0	0	0	0.5	2
Wyoming	0.5	0.5	0	0	0	0	1	2
Delaware	0	0.5	0	0	0	0	0.5	1
Mississippi	0	0	0	0	0	0	1	1
Nebraska	0.5	0	0.5	0	0	0	0	1
South Carolina	0	0	0.5	0	-1	0	1.5	1
Kansas	0	0	0	0	0	0	0.5	0.5
Texas	0.5	0	0	0	-1	0	1	0.5
Alaska	0	0	0	0	0	0	0	0
Guam	0	0	0	0	0	0	0	0
North Dakota	0	0	0	0	0	0	0	0
Puerto Rico	0	0	0	0	0	0	0	0
Virgin Islands	0	0	0	0	0	0	0	0
Virginia	0	0	0	0	-1	0	1	0
West Virginia	0	0	0.5	0	-1	0	0.5	0

*Where 2013 data were not available for efficiency program savings, states were scored on 2012 savings.

Our data sources included the Consortium for Energy Efficiency (CEE 2014), EIA (EIA 2013, 2014a, 2014b, 2014c), 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 and completeness of reporting. 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.[16] Overall scores for utility programs and policies are given in table 8. Tables 10, 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 have some unintended impacts on state rankings. For example, it 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 2014b); therefore, energy efficiency efforts in that state are aimed at reducing electricity consumption only. In past years, Hawaii has not been able to earn points for any categories related to natural gas. Last year, we attempted to rectify our likely undervaluation of relative efficiency efforts in Hawaii by awarding the state points for natural gas efficiency budgets equivalent to the proportion of points earned for electricity efficiency program budgets. This year, we carry this practice forward into other scoring subjects related to natural gas, including natural gas savings, performance incentives, and fixed cost recovery. Elsewhere, particularly in the Northeast, energy efficiency efforts often aim to reduce the consumption of fuel oil. While we may capture these efforts where they are combined with efficiency programs targeting electricity or natural gas, we have not specifically accounted for fuel oil savings from non-electricity programs.

Continuing our practice from last year, 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 therefore did not receive points in this category, whether or not they realized savings from natural gas efficiency programs in 2012 and 2013.

Finally, our decision 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 that are beyond the scope of the State Scorecard,

[16] Gross savings are those that are expected from energy efficiency programs, crediting all efficiency measures that are installed, including those that would have been installed even in the absence of programs. 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 without any incentive, or with a lesser 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).

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 2013. The data presented in this section are for customer-funded energy efficiency programs, which are 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 IOUs, 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 that states are making.[17] This year, as in previous years, we gathered energy efficiency program budget data from several sources: the CEE *2013 Annual Industry Report*, *Efficiency Program Industry by State and Region Appendices* (CEE 2014) and data requests to state utility commissions, regional efficiency groups, and other state sources.[18]As we did last year, we also attempted to collect data on actual program spending in 2013. However these data are not publicly available through any single 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, but will continue our efforts to collect data on actual spending. In the future, our preference will be to score states on actual, rather than planned, outcomes.

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

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[17] Prior to 2010, we depended on actual spending data from EIA, which has a two-year time lag.

[18] 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 budget, expenditure, and impacts data. The full report is viewable at http://www.cee1.org/annual-industry-reports.

the sources above to state utility commissions for review. Tables 10 and 12 below report electricity and natural gas efficiency program budgets, respectively.

It is important to clarify that budget data capture intention rather than 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. In 2012, results were similar, with states spending about 84% of reported budgets. Despite this pattern of underspending, 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.

States could receive up to 5 points based on the percentage of electric utility revenues represented by energy efficiency budgets.[19] Budgets representing at least 4% of revenues earned the maximum of 5 points. For every 0.4% less than 4%, a state's score decreased by 0.5 points. Table 9 lists the scoring bins for each level of spending and table 10 shows state-by-state results and scores for this category.

Table 9. Scoring of electric efficiency program budgets

Budgets as % of revenues	Score
4.00% or greater	5.0
3.60–3.99%	4.5
3.20–3.59%	4.0
2.80–3.19%	3.5
2.40–2.79%	3.0
2.00–2.39%	2.5
1.60–1.99%	2.0
1.20–1.59%	1.5
0.80–1.19%	1.0
0.40–0.79%	0.5
Less than 0.40%	0

[19] Statewide revenues are from EIA (2014a). 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.

Table 10. 2013 electric efficiency program budgets by state

State	2013 budget ($million)	% of statewide utility revenues	Score (5 pts.)
Rhode Island[1]	77.5	8.55%	5
Massachusetts[2]	507.7	6.42%	5
Vermont[3]	42.8	5.32%	5
Washington[4]	293.7	4.60%	5
Oregon[5]	171.3	4.32%	5
New Jersey	395.1	3.88%	4.5
Connecticut[6]	102.4	3.28%	4
California[7]	1188.8	3.18%	3.5
Maryland[8]	205.9	2.85%	3.5
Iowa[9]	106.7	2.83%	3.5
New York	593.9	2.65%	3
Illinois[10]	283.8	2.51%	3
Maine[11]	34.2	2.43%	3
Minnesota[12]	155.5	2.42%	3
New Hampshire[13]	27.4	2.24%	2.5
Idaho[14]	38.8	2.12%	2.5
Arizona[15]	143.2	1.86%	2
Arkansas[16]	65.9	1.81%	2
Colorado[17]	89.4	1.69%	2
Pennsylvania	237.6	1.66%	2
Nevada[18]	50.5	1.59%	1.5
Ohio	212.8	1.56%	1.5
Montana[19]	18.4	1.53%	1.5
Michigan[20]	165.5	1.43%	1.5
Utah	35.3	1.42%	1.5
Florida	258.1	1.13%	1
Wisconsin	79.9	1.09%	1
New Mexico[21]	23.1	1.08%	1
District of Columbia	14.0	1.06%	1
Hawaii	33.5	1.06%	1
Indiana[22]	76.8	0.86%	1
Oklahoma[23]	38.7	0.84%	1
Tennessee[24]	55.7	0.81%	1
Kentucky[25]	44.0	0.70%	0.5
Missouri	48.2	0.65%	0.5
North Carolina[26]	74.9	0.63%	0.5
Texas	181.4	0.56%	0.5
Nebraska[27]	13.8	0.53%	0.5
Wyoming	6.4	0.50%	0.5
South Dakota[28]	5.1	0.48%	0.5
West Virginia[29]	9.0	0.37%	0
Georgia[30]	40.1	0.32%	0
South Carolina	22.1	0.31%	0
Delaware[31]	2.4	0.19%	0
Mississippi	7.5	0.17%	0
Alabama	10.8	0.14%	0
Louisiana	3.7	0.05%	0
Kansas	0.7	0.02%	0
Virginia	0.8	0.01%	0
Alaska	0.0	0.00%	0
Guam[32]	0.0	0.00%	0
North Dakota	0.0	0.00%	0
Puerto Rico[33]	0.0	0.00%	0
Virgin Islands[34]	0.0	0.00%	0
U.S. total	6294.6	-	
Median	43.4	1.09%	

Budget data are from CEE 2014 except where noted. Statewide revenue data are from EIA 2014a. [1]RI PUC 2014.[2]MA DOER 2014.[3]VT PSD 2014.[4]Includes share of budget-based allocation of Bonneville Power Administration(BPA) incentive dollars across states.[5]Energy Trust of Oregon 2014 and2014; includes share of budget from BPA incentive dollars.[6]CT DEEP 2014.[7]CPUC 2014.[8]MD PSC 2014.[9]IUB 2014.[10]ICC 2014.[11]Efficiency Maine 2014.[12] MN COMM 2014.[13]NH PUC 2014.[14]Includes share of budget from BPA incentive dollars.[15]SWEEP 2014a.[16]AR PSC 2014.[17]CO DORA 2014.[18]NV PUCN 2014; includes share of budget from BPA incentive dollars.[19]Includes share of budget from BPA incentive dollars.[20]MI PSC 2014.[21]NM PRC 2014.[22]IURC 2014.[23]OCC 2014.[24]TVA 2014.[25]KY PSC 2014.[26]PSNCUC 2014.[27]NPPD 2014; OPPD 2014; Lincoln Electric System 2014.[28]SD PUC 2014.[29]WV PSC 2014.[30]GA PSC 2014.[31]DNREC 2014.[32]Guam Energy Office 2014. [33]Puerto Rico Office of the Governor 2014. [34]Virgin Islands Energy Office 2014.

Scoring on Natural Gas Program Budgets

We scored states on natural gas efficiency program budgets by awarding up to 2 points based on 2013 program budget data gathered from utility commission filings, CEE (CEE 2014), and a survey of state utility commissions and independent statewide administrators.[20] In order to directly compare spending data among the states, we normalized spending by the number of residential natural gas customers in each state, as reported by EIA (2014b).[21] Table 11 shows scoring bins for natural gas program spending.

Table 11. Scoring of natural gas utility and public benefits budgets

Budget range	Score
$50 or greater	2.0
$35.00–49.99	1.5
$20.00–34.99	1.0
$5.00–19.99	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 $150 million compared to last year, with many states spending more than $50 per residential customer. However, overall natural gas efficiency budgets remained significantly lower than budgets for electricity programs. Table 12 shows states' scores.

[20] Last year, states were able to earn 3 points in this category. In order to emphasize the importance of energy efficiency program outcomes, this year one of those points was moved to the natural gas savings category.

[21] 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 (2014b).

Table 12. 2013 natural gas efficiency program budgets by state

State	2013 budget ($million)	$ per residential customer	Score (2 pts.)
Massachusetts[1]	173.5	$119.99	2
Rhode Island[2]	19.5	$83.28	2
New Jersey	196.4	$66.83	2
Iowa[3]	50.6	$59.71	2
Ohio	50.3	$58.78	2
New Hampshire[4]	6.3	$55.51	2
Vermont	2.2	$53.68	2
New York	174.9	$50.30	2
Connecticut[5]	24.1	$47.38	1.5
Maine[6]	0.8	$40.42	1.5
Oregon[7]	27.3	$39.37	1.5
Utah[8]	31.0	$36.87	1.5
Minnesota[9]	44.1	$30.66	1
Florida	18.2	$27.14	1
Illinois[10]	98.9	$26.25	1
Michigan[11]	83.8	$26.19	1
California	260.4	$25.72	1
Arkansas[12]	12.9	$23.46	1
District of Columbia[13]	2.9	$22.36	1
Washington	17.3	$15.85	0.5
Maryland[14]	15.0	$13.76	0.5
Indiana[15]	23.3	$13.33	0.5
Oklahoma[16]	12.1	$13.05	0.5
Wisconsin	24.2	$12.96	0.5
Wyoming	1.4	$11.85	0.5
Pennsylvania	24.3	$10.22	0.5
Colorado	16.5	$9.94	0.5
South Dakota[17]	1.4	$8.05	0.5
New Mexico	4.0	$7.04	0.5
Nevada	5.4	$6.88	0.5
Missouri[18]	9.1	$6.56	0.5
Arizona[19]	6.3	$5.44	0.5
Delaware[20]	0.8	$5.22	0.5
Hawaii*	—	$0.00	0.5
Virginia	2.9	$2.65	0
Kentucky	1.6	$2.14	0
North Carolina[21]	2.1	$1.82	0
North Dakota	0.1	$1.06	0
Texas	3.1	$0.72	0
South Carolina	0.4	$0.60	0
Montana	0.1	$0.23	0
Alabama	0.0	$0.00	0
Alaska	0.0	$0.00	0
Georgia	0.0	$0.00	0
Guam*	—	$0.00	0
Idaho	0.0	$0.00	0
Kansas	0.0	$0.00	0
Louisiana	0.0	$0.00	0
Mississippi	0.0	$0.00	0
Nebraska	0.0	$0.00	0
Puerto Rico*	—	$0.00	0
Tennessee	0.0	$0.00	0
Virgin Islands*	—	$0.00	0
West Virginia	0.0	$0.00	0
U.S. total	**1,449.4**	**—**	
Median	**4.0**	**$9.00**	

*Hawaii and the territories use very limited amounts of natural gas. Points are commensurate with points earned for electric efficiency budgets. Budget data are from CEE 2014 unless otherwise noted. [1]MA DOER 2014. [2]RI PUC 2014. [3]IUB 2014. [4]NH PUC 2014. [5]CT DEEP 2014. [6]Efficiency Maine 2014. [7]Energy Trust of Oregon 2014 and OR DOE 2014. [8]SWEEP 2014b. [9]MN COMM 2014. [10]ICC 2014. [11]MI PSC 2014. [12]AR PSC 2013. [13]DDOE 2014b. [14]MD PSC 2014. [15]IURC 2014. [16]OCC 2014. [17]SD PUC 2014. [18]MO PSC 2014. [19]SWEEP 2014a. [20]DNREC 2014. [21]PSNCUC 2014.

Scoring on Annual Savings in 2013 from Electric Efficiency Programs

We scored states on net annual incremental electricity savings[22] that resulted from energy efficiency programs offered in 2013.[23] Data for electricity sales and savings were based on EIA's *Monthly Electric Utility Sales and Revenue Report With State Distributions* (2014a) and *Annual Electric Power Industry Report* (2013), 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, and these differences can produce inequities when making comparisons.[24] 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 spillover (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 freeriders and freedrivers, 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 9 reported both, for different purposes (Kushler, Nowak, and Witte 2012).[25] 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).[26] Doing so allows for more straightforward comparison with other states that report net electricity savings. Savings (or some portion of savings) reported as gross[27] are marked by a dagger (ŧ) in table 14. In Arizona, a measurement and verification study concluded that net savings are equal to

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

[23]Data for 2013 were not available in all states and territories, but we felt that due to the high level of reporting of these numbers, it was possible to compare the most recent data available between states. We substituted 2012 data for states that could not report 2013 savings data. Data for both 2012 and 2013 are presented separately in Appendix B. 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.

[24]See Sciortino et al. (2011).

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

[26] 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.

[27]Savings were determined to be gross based on Kushler, Nowak, and Witte (2012) and on responses to our survey of public utility commissions.

gross savings within the state (SWEEP 2014a). In such cases, we have not applied a conversion factor, and consider reported savings to be net.

We have reported 2013 statewide energy efficiency savings as a percentage of retail electricity sales in 2013 and scored the states on a scale of 0 to 5. Since 2013 savings data were not available from EIA at the time of research, we relied on states to provide these data. Thirty-six states and the District of Columbia were able to do so. Where no data for 2013 were reported, we used the most recent savings data available from EIA (2013b). Data for both 2012 and 2013 are presented in Appendix B.

This year, to reflect the goals of some of the top-performing states, we once again adjusted our scoring. States that achieved savings equivalent to at least 2% of electricity sales earned 5 points, with scores decreasing by 0.5 points for every 0.20% decrease.[28]

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 programs in 2013 totaled 24 million MWh, equivalent to 0.67% of sales.[29]

Table 13. Scoring methodology for utility and public benefits electricity savings

Savings as % of sales	Score
2% or greater	5
1.80–1.99%	4.5
1.60–1.79%	4
1.40–1.59%	3.5
1.20–1.39%	3
1.00–1.19%	2.5
0.80–0.99%	2
0.60–0.79%	1.5
0.40–0.59%	1
0.20–0.39%	0.5
Less than 0.20%	0

[28] Last year, states earned full credit for reported net annual incremental sales of 1.5% of sales.

[29] As noted above, 2013 savings were not available in some states at the time of publication. In these cases, we substituted 2012 electricity savings.

Table 14. 2013 net incremental electricity savings by state

State	2013 net incremental savings (MWh)	% of retail sales	Score (5 pts.)
Rhode Island[1]	161,831	2.09%	5
Massachusetts[2]	1,116,442	2.05%	5
Vermont[3]	99,074	1.78%	4
Arizona[4]	1,317,329	1.74%	4
Hawaii[5]	159,056ǂ	1.67%	4
Michigan[6]	1,284,863	1.51%	3.5
Oregon[7]	676,046	1.43%	3.5
Washington[8]	990,143ǂ	1.35%	3
California*	3,223,733	1.25%	3
New York[9]	1,617,667	1.13%	2.5
Iowa[10]	491,543	1.06%	2.5
Minnesota[11]	699,998ǂ	1.04%	2.5
Illinois[12]	1,318,916	0.99%	2
Maryland[13]	641,322	0.97%	2
Pennsylvania[14]	1,410,305ǂ	0.97%	2
Connecticut[15]	285,817	0.97%	2
Wisconsin[16]	619,418	0.90%	2
Ohio*	1,323,498	0.89%	2
Colorado[17]	472,000	0.88%	2
Utah[18]	264,375	0.87%	2
Nevada[19]	171,369	0.81%	2
Idaho*	188,245	0.78%	1.5
Maine[20]	92,313	0.78%	1.5
Montana*	91,474	0.65%	1.5
Indiana*	615,018	0.59%	1
New Jersey[21]	418,693ǂ	0.56%	1
New Hampshire[22]	58,774	0.56%	1
North Carolina[23]	718,739	0.55%	1
New Mexico[24]	126,069	0.54%	1
Kentucky[25]	437,276	0.52%	1
Missouri[26]	406,897	0.49%	1
Arkansas[27]	227,531	0.49%	1
District of Columbia[28]	52,303	0.47%	1
South Carolina[29]	298,215	0.38%	0.5
Tennessee[30]	273,267ǂ	0.28%	0.5
Oklahoma[31]	156,847	0.27%	0.5
Florida*	587,083	0.27%	0.5
West Virginia[32]	69,241	0.22%	0.5
Georgia[33]	288,140ǂ	0.22%	0.5
Nebraska[34]	53,850	0.20%	0.5
Texas[35]	693,968	0.19%	0
South Dakota[36]	21,435	0.18%	0
Wyoming*	23,605	0.14%	0
Delaware[37]	8,809ǂ	0.08%	0
Mississippi*	36,810	0.08%	0
North Dakota*	10,330	0.07%	0
Alabama*	56,045	0.06%	0
Virginia*	29,923	0.03%	0
Alaska*	1,517	0.02%	0
Louisiana[38*]	20,572	0.02%	0
Kansas*	8,907	0.02%	0
Guam[39]	0	0.00%	0
Puerto Rico[40]	0	0.00%	0
Virgin Islands[41]	0	0.00%	0
U.S. total	**24,392,186**	**0.67%**	
Median	**245,953**	**0.56%**	

*These states did not report 2013 savings and were scored on 2012 savings. 2012 savings data are as reported in EIA 2013a unless otherwise noted. ǂ 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. [1]RI PUC 2014.[2]MA DOER 2014.[3]VT PSD 2014.[4]SWEEP 2014a.[5]HI PUC 2014.[6]MI PSC 2014.[7]Energy Trust of Oregon 2014 and OR DOE 2014.[8]WA UTC 2014.[9]NY DPS 2014 and NYSERDA 2014; also includes savings from Long Island Power Authority (LIPA). [10]IUB 2014; includes IOU savings only.[11]MN COMM 2014. [12]ICC 2014. [13]MD PSC 2014. [14]PA PUC 2014. [15]CT DEEP 2014. [16]WI PSC 2014. [17]SWEEP 2014b and CO DORA 2014. [18]UT PSC 2014. [19]NV PUCN 2014. [20]Efficiency Maine 2014. [21]NJ BPU 2014. [22]NH PUC 2014. [23]PSNCUC 2014. [24]NM PRC 2014. [25]KY PSC 2014. [26]MO PSC 2014. [27]AR PSC 2014. [28]DDOE 2014a. [29]SC ORS 2014. [30] TVA 2014. [31]OCC 2014. [32]WV PSC 2014. [33]GA PSC 2014. [34]NPPD 2014, OPPD 2014, and Lincoln Electric System 2014. [35]Frontier Associates 2014. [36]SD PUC 2014. [37]DNREC 2014. [38]2012 data from Entergy New Orleans 2013. [39]Guam Energy Office 2014. [40]Puerto Rico Office of the Governor 2014. [41]Virgin Islands Energy Office 2014.

Scoring on Annual Savings in 2013 from Natural Gas Efficiency Programs

Increasingly, utilities are beginning to incorporate natural gas programs in their portfolios 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. 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	2.0
0.75–0.99%	1.5
0.50–0.74%	1.0
0.25–0.49%	0.5
Less than 0.25%	0

States that did not provide natural gas data were treated as having no 2013 savings.

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

Table 16. State scores for 2013 natural gas efficiency program savings

State	2013 net incremental savings (MMTherms)	% of commercial and residential retail sales*	Score (2 pts.)
Vermont[1]	0.80	1.47%	2
Minnesota[2]	26.82ǂ	1.36%	2
Massachusetts[3]	24.67	1.28%	2
Rhode Island[4]	3.30	1.24%	2
Michigan[5]	44.00	1.02%	2
New Hampshire[6]	1.39	0.93%	1.5
Wisconsin[7]	17.50	0.90%	1.5
Iowa[8]	7.92ǂ	0.78%	1.5
Hawaii	—	0.00%	1.5**
Arkansas[9]	5.19	0.75%	1
Oregon[10]	5.30	0.73%	1
Utah[11]	6.37	0.65%	1
Connecticut[12]	4.80	0.56%	1
Illinois[13]	29.30	0.52%	1
Washington[14]	7.02ǂ	0.51%	1
Arizona[15]	3.30	0.49%	0.5
California[16]	31.00	0.41%	0.5
New York[17]	25.70	0.40%	0.5
Kentucky[18]	2.96	0.39%	0.5
Colorado[19]	6.10	0.36%	0.5
Indiana[20]	6.30	0.34%	0.5
Oklahoma[21]	2.90	0.33%	0.5
New Jersey[22]	8.82ǂ	0.24%	0
South Dakota[23]	0.43	0.21%	0
District of Columbia[24]	0.50	0.18%	0
Maine[25]	0.14	0.15%	0
West Virginia[26]	0.70	0.15%	0
Nevada[27]	0.96	0.14%	0
New Mexico[28]	0.68	0.12%	0
Maryland[29]	1.00	0.07%	0
Delaware[30]	0.10	0.05%	0
South Carolina[31]	0.08	0.02%	0
Alabama	0.00	0.00%	0
Alaska	0.00	0.00%	0
Florida	0.00	0.00%	0
Georgia	0.00	0.00%	0
Guam	0.00	0.00%	0
Idaho	0.00	0.00%	0
Kansas	0.00	0.00%	0
Louisiana	0.00	0.00%	0
Mississippi	0.00	0.00%	0
Missouri	0.00	0.00%	0
Montana	0.00	0.00%	0
Nebraska	0.00	0.00%	0
North Carolina	0.00	0.00%	0
North Dakota	0.00	0.00%	0
Ohio	0.00	0.00%	0
Pennsylvania	0.00	0.00%	0
Puerto Rico	0.00	0.00%	0
Tennessee	0.00	0.00%	0
Texas	0.00	0.00%	0
Virgin Islands	0.00	0.00%	0
Virginia	0.00	0.00%	0
Wyoming	0.00	0.00%	0

States that did not provide natural gas savings data were treated as having no 2013 savings. *Sales include only those attributed to commercial and residential sectors. All sales data are from EIA 2013b. **Hawaii is awarded points commensurate with points received for electricity savings. ǂ 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. [1]VT PSD 2014 [2]MN COMM 2014. [3]MA DOER 2014.[4]RI PUC 2014.[5]MI PSC 2014.[6]NH PUC 2014.[7]WI PSC 2014.[8]IUB 2014; includes IOU savings only.[9]AR PSC 2014.[10]Energy Trust of Oregon 2014 and OR DOE 2014.[11]UT PSC 2014.[12]CT DEEP 2014.[13]ICC 2014.[14]WA UTC 2014.[15]SWEEP 2014a.[16]CPUC 2014.[17]NY DPS 2014.[18]KY PSC 2014.[19]CO DORA 2014.[20]IURC 2014.[21]OCC 2014.[22]NJ BPU 2014.[23]SD PUC 2014.[24]DDOE 2014b.[25]Efficiency Maine 2014.[26]WV PSC 2014.[27]NV PUCN 2014.[28]NM PRC 2014.[29]MD PSC 2014. [30]DNREC 2014. [31]Piedmont Natural Gas 2014.

Scoring on Large Customer Opt-Out Provisions

Increasingly, states are considering opt-out provisions for large customers. To reflect this trend, which can severely limit the amount of energy efficiency available within a state, for the first time this year we included a category in which states may lose, rather than gain, points. We subtracted 1 point for states with provisions in place allowing electric or natural gas customers, or both, to opt out of energy efficiency programs.[30]

We did not subtract points for self-direct programs. When implemented properly, these programs can be effective ways of meeting the needs of large customers. However, self-direct programs vary from state to state, with some requiring more stringent measurement and verification of energy savings than others. Self-direct programs were not scored, but are detailed in Appendix C. In the future, we will likely examine these programs with a more critical eye and subtract points from states that lack strong evaluation and measurement programs. States with opt-out programs in place are listed in table 17.

Table 17. Provisions allowing large customers to opt out of energy efficiency programs

State	Description	Score
Arkansas	Customers with over 1 MW or 70,000 therms in monthly demand may opt out. Only nonmanufacturing customers must offer documentation of similar planned or achieved savings. A significant percentage of eligible load has opted out, although it varies by utility.	–1
Indiana	A provision passed in March 2014 allows customers that operate a single site with at least one meter constituting more than 1 MW demand for any one billing period within the previous 12 months to opt out of programs.	–1
Kentucky	Customers statewide are eligible to opt out of programs based on rate class.	–1
Maine	Large customers that take transmission and subtransmission service are automatically opted out of Maine's efficiency programming. These customers do not pay into Maine's cost-recovery mechanism programming. However, federal stimulus funds and collected money from the Regional Greenhouse Gas Initiative have allowed Efficiency Maine to offer energy efficiency programming to the state's largest industrial customers. LD 1559, enacted in 2013, approved the first direct contract between Maine's IOUs and Efficiency Maine for the purpose of delivering new efficiency and distributed generation projects for large industrial customers.	–1
Missouri	Any customer meeting one or more of the following criteria may opt out of participation in utility-offered demand-side programs. 1. The customer has one or more accounts within the service territory of the electric utility that had a demand of the individual accounts of 5,000 kW or more in the previous 12 months. 2. The customer operates an interstate pipeline pumping station, regardless of size. 3. The customer has accounts within the service territory of the electric utility that had, in aggregate across its accounts, a coincident demand of 2,500 kW or more in the previous 12 months and the customer has a comprehensive demand-side or energy efficiency program and can demonstrate an achievement of savings at least equal to those expected from utility-provided programs.	–1

[30] By default, most large gas customers already are opted out because they take wholesale delivery (frequently directly from transmission) and are thus outside the purview of state government. We did not subtract points in these cases.

State	Description	Score
North Carolina	All industrial class electric customers are eligible for opting out. Also by Commission Rule R8-68 (d), large commercial class customers with 1 million kWh of annual energy consumption are eligible to opt out. Currently, about 45% of eligible load has opted out.	–1
Oklahoma	All transportation-only gas customers and electric utility customers with consumption of greater than 15 million kWh annually are eligible to opt out. Combined meters may meet the threshold. Approximately 80% of eligible customers opt out, representing about 25% of total load.	–1
South Carolina	Industrial, manufacturing, or retail commercial customers with annual usage of 1 million kWh or greater are eligible to opt out. Self-certification only is required.	–1
Texas	In Texas, for-profit customers that take electric service at the transmission level are not allowed to participate in utilities' energy efficiency programming and therefore do not pay for it. Instead, industrial customers develop their own energy efficiency plans if desired and work with third-party providers to implement and finance energy efficiency investments. There is no measurement or monitoring of the investments these large customers do or do not make.	–1
Virginia	Certain large customers are exempt from paying for the costs of new energy efficiency programs. Dominion Power customers may qualify for its opt-out program by having average demands of between 500kW; and 10MW; customers over 10 MW do not participate in the state's energy efficiency programming by law. Once customers opt out, they cannot take advantage of existing programming or be charged for it. Customers must show that they have already made energy efficiency investments or plan to in the future. Customers must submit measurement and verification reports yearly in support of their opting out of programs funded by a cost-recovery mechanism.	–1
West Virginia	Customers with demand of 1 MW or greater may opt out. Claims of energy and/or demand reduction are certified to utilities, with future evaluation by the public utilities commission to take place in a later proceeding. The method of such future evaluation has not been specified. To date, 16 large customers have opted out.	–1

Scoring on Energy Efficiency Resource Standards

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

A state could earn up to 3 points for an EERS policy based on a number of factors. As shown in table 18, states were scored on a sliding scale based on the savings called for by their electricity savings targets. States could also earn an additional 0.5 points if natural gas was included in the savings goals. Some EERS policies also contain cost caps that limit spending, thereby reducing the effectiveness of the EERS policy. We reduced a state's score by 0.5 points if its EERS policy includes a cost cap provision. This year, we awarded top points to states with energy savings targets of 1.5% of sales or greater. However, in the future, we will likely be more stringent in our scoring. As more states prove that electricity savings of over 2% are feasible and cost-effective, raising the bar in this policy area seems necessary.

Table 18. Scoring methodology for energy savings targets

Savings target or current level of savings met	Score
1.5% or greater	3
1–1.49%	2
0.5–0.99%	1
Less than 0.5%	0

Other considerations	Score
Cost cap is in place	–0.5
EERS includes natural gas	+0.5

To aid in comparing states, we estimated 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. States with a pending EERS policy that had not yet established a clear path toward implementation include Alaska, Utah,[31] Delaware, and Virginia. See table 19 below for scoring results and Appendix D for full policy details.

Since the publication of the 2013 edition of the State Energy Efficiency Scorecard, there have been changes in the status of EERS policies in two states. Both Ohio and Indiana legislatures voted to roll back EERS policies in 2014. Neither of these states is therefore considered to have an EERS policy in this year's State Scorecard.

Table 19. State scores for energy efficiency resource standards

State	Approx. annual electric savings target (2014–20)	Approx. % of retail sales covered by EERS	Cost cap	Natural gas	Score (3 pts.)
Massachusetts	2.6%	86%		•	3
Arizona	2.4%	56%		•	3
Rhode Island	2.3%	99%		•	3
Vermont	2.0%	100%			3
Maryland[1]	1.6%	100%			3
Maine	1.6%	100%		•	3
Minnesota	1.5%	86%		•	3
Colorado	1.5%	57%		•	3
Oregon	1.4%	69%		•	2.5
Connecticut	1.4%	93%		•	2.5

[31] 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 have been codified into regulatory language by the Public Service Commission, so they remain advisory, not binding.

State	Approx. annual electric savings target (2014–20)	Approx. % of retail sales covered by EERS	Cost cap	Natural gas	Score (3 pts.)
Iowa	1.3%	74%		•	2.5
New York[2]	1.0%	100%		•	2.5
Washington	1.4%	79%			2
Hawaii	1.4%	100%			2
New Mexico	1.0%	68%			2
Michigan	1.0%	100%	•	•	2
California	0.9%	78%		•	1.5
Arkansas	0.8%	53%		•	1.5
Illinois[3]	0.9%	89%	•	•	1
Wisconsin	0.7%	100%	•	•	1
Pennsylvania	0.8%	97%	•		0.5
North Carolina	0.4%	99%			0
Nevada	0.4%	62%			0
Texas	0.1%	70%	•		0

[1]Refers to portion of target assigned to utilities.[2]Reflects EEPS target for 2012–15 program cycle.
[3]Average utility targets as approved by the Illinois Commerce Commission (ICC). See Appendix D for details and sources.

Long-term energy savings targets require leadership, sustainable funding sources, and institutional support for states to achieve their goals. Several states currently have or in the past have had 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 include Florida, New Jersey, and Delaware, none of which earned points in this category this year.[32] However, Delaware recently passed legislation that will likely lead to rules requiring utilities to meet long-term targets. 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 (Downs and Cui 2014).

[32] In Florida, cumulative energy savings targets of approximately 3.3% by 2019 remain in place for seven utilities (five IOUs), but the Florida Public Service Commission approved program plans in 2011 for Progress Energy (now Duke Florida) 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. In the ongoing 2014 energy efficiency goal proceeding, the Florida utilities have proposed to reduce their efficiency efforts from 2010 levels by at least 80%. In New Jersey and Delaware, available funds for energy efficiency are far below the amount necessary to meet savings targets laid out by state legislators. However, recent legislation in Delaware has clarified that rate recovery for energy efficiency programs is allowable for utilities.

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/LRAMs) are critical to leveraging energy efficiency funding and encouraging savings over the near and long terms. A state could earn up to 3 points for having adopted financial incentive mechanisms for utilities' efficiency programs for electricity 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 and Local Policy Database (ACEEE 2014). Details describing the scoring methodology are provided in table 20.

Table 20.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. An LRAM or ratemaking approach for recovery of lost revenues established for at least one major utility, for both electricity 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. An 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, with a few exceptions. We noted policy changes in two states. In Connecticut, Connecticut Natural Gas was decoupled in 2014. Wisconsin allowed a decoupling pilot to lapse, ending contributions in 2013. We also adjusted our scoring to better reflect existing policy landscapes in a few states. We awarded additional points to Vermont, where electric and natural gas utilities are decoupled. In Indiana, we did not award full points for electric decoupling, since Vectren's decoupling mechanism was rejected in 2011. In Delaware, we considered decoupling to be pending, since the docket was put on hold in late 2011. With proper legislation now in place,

it is likely that decoupling will be approved in the future, at which point our assessment of the policy will change.

This year, 30 states have a performance incentive in place or pending for electric utilities, the same number as last year. The number of states with a performance incentive in place or pending for gas utilities has also remained the same, with 21 states allowing performance incentives for natural gas utilities.

Due to the ending of decoupling pilots and programs in Wisconsin and Indiana, we counted 15 states with decoupling pending or in place for at least one major electric utility, down from 17 last year. The number of states with natural gas decoupled (or pending) for at least one major utility has increased from 21 to 22.

Table 21 outlines these efforts.

Table 21. Utility efforts to address lost revenues and financial incentives

	Decoupling or LRAM		Performance incentives		
State	Electric	Natural gas	Electric	Natural gas	Score (3 pts.)
California	Yes	Yes	Yes	Yes	3
Connecticut	Yes[3]	Yes[3]	Yes	Yes	3
Hawaii	Yes	—	Yes	—	3
Massachusetts	Yes	Yes	Yes	Yes	3
New York	Yes	Yes	Yes	Yes	3
Rhode Island	Yes	Yes	Yes	Yes	3
Alabama	Yes[2]	Yes[2]	Yes	Yes	2.5
Arkansas	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
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
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
Vermont	Yes	Yes	Yes	No	2.5
Wisconsin	No	Yes[3]	Yes	Yes	2.5
Arizona	Yes[2]	Yes[3]	Yes	No	2
Indiana	Yes[2]	Yes	Yes	No	2

State	Decoupling or LRAM		Performance incentives		Score (3 pts.)
	Electric	Natural gas	Electric	Natural gas	
Missouri	Yes[2]	Yes[2]	Yes	Yes[1]	2
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
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
New Jersey	Yes[1,2]	Yes[2]	No	No	1
Texas	No	No	Yes	No	1
Utah	No	Yes	No	No	1
Virginia	No	Yes	No	No	1
Wyoming	Yes[2]	Yes	No	No	1
Delaware	Yes[1]	Yes[1]	No	No	0.5
Kansas	Yes[2]	No	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
Guam	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
North Dakota	No	No	No	No	0
Pennsylvania	No	No	No	No	0
Puerto Rico	No	—	No	—	0
Virgin Islands	No	—	No	—	0

[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. *We awarded points to Hawaii only for electric utility business models, since minimal amounts of natural gas are used in the state.

Leading and Trending States in Utility and Public Benefits Programs and Policies

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 on developing 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 2013–15. In 2013, the state saw electricity savings reach over 2% of retail sales.

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 into place an optimal mix of policies, including an EERS and performance incentives, to encourage successful programs.

Rhode Island. Rhode Island invests a greater proportion of utility revenues in energy efficiency than any other state due to its loading order requirement that utilities invest in all cost-effective energy efficiency. A recent revision of the state's energy efficiency potential study confirmed that it should continue to strive for electricity savings of over 2% per year for the next three years. Natural gas targets are similarly aggressive, calling for savings of at least 1% per year. The state's energy efficiency plans are overseen by a stakeholder board with representatives from government agencies, environmental groups, businesses, and consumer advocates.

Arkansas. Arkansas is a leading state in the Southeast, having significantly ramped up its utility-sector energy efficiency initiatives since 2007. In that year, the Arkansas Public Service Commission approved rules for conservation and energy efficiency programs requiring electric and natural gas utilities to administer energy efficiency programs. In 2010, the state adopted an EERS for both electricity and natural gas and established rules for cost recovery, performance incentives, and utility resource planning. Arkansas recently commissioned a potential study to inform future targets. Both electric and natural gas savings continue to increase in the state, although an opt-out provision may limit future savings.

OTHER METHODOLOGY NOTES

This year, we attempted to minimize the data lag when scoring states in this chapter of the *State Energy Efficiency Scorecard*. While not every state reported 2013 electricity and natural gas savings data, our practice was to use the most recent data available. This led to combined 2012–13 savings data being presented in this chapter. Savings data for 2012 and 2013 are presented separately in Appendix B. In the future, we will continue to work toward reporting the most up-to-date data possible.

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 to reduce the need to drive.

Tailpipe Emission Standards and Zero-Emission Vehicle Program

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 2002, California passed the Pavley Bill (Assembly Bill 1493), the first law in the United States to address GHG emissions from vehicles. The law requires the California Air Resources Board to regulate GHGs as part of the California Low Emission Vehicle Program. The GHG reductions that have resulted from this law are achieved largely through improved fuel efficiency, making these standards, to a large degree, energy efficiency policies.

In 2010, EPA and DOT issued harmonized national standards for fuel economy and GHG emissions for model years 2012 to 2016.The standards match California's GHG tailpipe standards in stringency and call for fleetwide average fuel economy of 34.1 miles per gallon (mpg) by 2016. In 2012, the California Air Resources Board adopted new GHG standards for model years 2017 to 2025. DOT and EPA subsequently finalized new standards as well, calling for a fleetwide average of between 48.7 and 49.7 mpg by 2025. The programs are now harmonized, but California also has an updated zero-emission vehicle (ZEV) program that requires increasing production of plug-in hybrid, battery electric, and fuel-cell vehicles from 2018 to 2025. States may also choose to adopt the ZEV program.

States may choose to adopt either the federal vehicle emissions standards or California's, and 14 states and the District of Columbia have adopted California's GHG regulations. The states are Connecticut, Delaware, Florida, Maine, Maryland, Massachusetts, New Jersey, New Mexico, New York, Oregon, Pennsylvania, Rhode Island, Vermont, and Washington (Clean Cars Campaign 2014).

Incentives for High-Efficiency Vehicles

High purchase cost is often a major barrier to the entry of fuel-efficient vehicles into the marketplace because these vehicles contain new, advanced technologies. To encourage consumers to purchase fuel-efficient vehicles, states may offer a number of financial incentives, including tax credits, rebates, and sales tax exemptions. 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). Although alternative-fuel vehicles can provide substantial environmental benefits by reducing pollution, they do not necessarily increase

fuel efficiency, and policies to promote their purchase therefore are not included in the State Scorecard. However, the State Scorecard does include incentives for EVs and hybrids in particular, since these vehicles typically do have high fuel efficiency. 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.

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 promote increased automobile use and consequently have questionable net energy benefit.

EV Registrations

As more EVs become available to drivers, states have a significant role to play in overcoming the barriers to their widespread adoption. In addition to reducing the high up-front costs associated with these vehicles, states can provide incentives for the construction of the required fueling infrastructure. Additionally, non-financial benefits such as emissions testing exemptions make it more convenient to own an EV. The total number of EV registrations allows us to measure the state's success in making EVs a feasible vehicle option for drivers.

Integration of Policies for Land Use and Transportation Planning

Sound land use planning is vital in supporting 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 environment; 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 VMT, 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

VMT Reduction Targets and VMT Growth

Increasing vehicle fuel economy will not adequately address energy use in the transportation sector in the long term if growth in total VMT goes unchecked. While VMT on U.S. highways have not increased in recent years, continued economic recovery could bring a return to an upward trend. Projections by EIA predict a 14% increase in light-duty VMT between now and 2030, slightly outpacing anticipated population growth in the United States, despite being significantly lower than previous EIA estimates (EIA 2014d). Other analyses indicate, however, that lower growth rates for VMT 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 VMT into the future (Dutzik and Baxandall 2013).

In any case, reducing the growth in VMT is a key component of managing transportation energy use. Several states have taken on this challenge directly by setting VMT reduction targets. Success in achieving these targets will require the coordination of transportation and land use planning.

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 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.

By enabling the growth of multimodal transportation, such statutes can lead to environmental benefits from reduced vehicle emissions, promote better health through active transportation, and 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 for all pedestrians, bicyclists, motorists, and public transportation users. Complete streets foster increased use of alternatives 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 2012). 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 to and use of those roadways.

Freight

Many states, though not all, have freight transportation plans in place. With the passage of the 2012 federal transportation funding authorization bill, Moving Ahead for Progress in the

21st Century (MAP-21), 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 (U.S. Congress 2012).

As part of these plans, states may adopt concrete energy efficiency targets or performance measures. 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 or evaluating 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 were eligible for points under this metric as well.

METHODOLOGY AND RESULTS

Major steps have been taken recently at the federal level to reduce fuel consumption in the United States. In 2012, EPA and DOT finalized new GHG and fuel economy standards for model year 2017 to 2025 light-duty vehicles. The first standards for model year 2014 to 2018 heavy-duty vehicles were adopted in 2011. 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 and ZEV program earned 1.5 points in this chapter. Additionally, states with consumer incentives for the purchase of high-efficiency vehicles were awarded 0.5 points, while those with more than 20 registered EVs per 100,000 people qualified for an additional 0.5 points.

States lead the way in improving not only public fleet fuel efficiency, but also the efficiency of transportation systems more broadly. Several states have made significant progress toward developing financially stable, comprehensive transit systems. New Jersey and Minnesota saw a 17% and 18% increase in per capita transit spending, respectively, between fiscal years 2011 and 2012. Additionally, 18 states have transit statutes in place that provide sustainable funding sources for operating expenses in addition to the expansion and maintenance of transit facilities. States that have adopted such statutes earned 1 point in this year's State Scorecard. For details, see Appendix E. States also received points based on the magnitude of their transit spending: relatively large investments ($50 per capita or more) received 1 point, while investments ranging from $20 to $50 per capita received 0.5 points.

Policies promoting compact development and ensuring the accessibility of major destinations are essential to reducing energy use in transportation in the long term. States with smart growth statutes earned 1 point. These statutes include 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 the ACEEE State and Local Policy Database (ACEEE 2014). States that adopted reduction targets for VMT statewide were also eligible for 1 point. This year Vermont earned a point for the VMT goals outlined in the Comprehensive Energy Plan adopted in 2011. The Comprehensive Energy Plan requires per capita VMT to remain at or below 2011 levels and overall VMT growth to be limited to 1.5% annually. An additional point was awarded to states whose rolling 10-

year VMT average fell by 5% or more between 2010 and 2012. A reduction of between 1% and 5% earned 0.5 points. VMT data were not adjusted to account for fluctuations in economic conditions during the time period. We also awarded 0.5 points to states with complete streets statutes that ensure proper attention to the needs of pedestrians and cyclists in all road projects.

With regard to freight system efficiency, states could earn 0.5 points if they have a freight-specific transportation plan meeting MAP-21 requirements. An additional 0.5 points were awarded if those plans contained energy efficiency performance metrics.

Table 22 shows the results.

Table 22. State scores for transportation policies

State	GHG tailpipe emissions standards and ZEV program (1.5 pts.)[1]	EV registrations per 100,000 people (0.5 pts.)[2]	Integration of transportation and land use planning (1 pt.)[3]	MAP-21 freight plans and goals (1 pt.)[4]	VMT targets (1 pt.)[5]	Average % change in VMT per capita 2010–2012 (1 pt.)	Transit funding (1 pt.)[6]	Dedicated transit revenue stream statutes (1 pt.)[7]	Complete streets legislation (0.5 pts.)[8]	High-efficiency vehicle consumer incentives (0.5 pts.)[9]	Total score (9 pts.)
California	1.5	0.5	1	1	1	1	0.5	1	0.5	0.5	8.5
New York	1.5	0.5	1	0.5	1	0.5	1	1	0.5	0.5	8
Massachusetts	1.5	0	1	0.5	1	0	1	1	0.5	0.5	7
Oregon	1.5	0.5	1	0.5	1	1	0	1	0.5	0	7
Washington	1	0.5	1	0.5	1	1	0	1	0.5	0.5	7
Vermont	1.5	0.5	1	0.5	1	1	0	0	0.5	0	6
Pennsylvania	1	0	0	0.5	0	1	1	1	0.5	0.5	5.5
Connecticut	1.5	0	1	0.5	0	0.5	1	0	0.5	0	5
Delaware	1	0	1	0.5	0	1	1	0	0.5	0	5
District of Columbia	1.5	0.5	0	0.5	0	1	1	0	0	0.5	5
Illinois	0	0	1	0.5	0	0.5	1	1	0.5	0.5	5
Maine	1.5	0	1	0.5	0	0.5	0	1	0.5	0	5
Maryland	1.5	0	1	0.5	0	0	1	0	0.5	0.5	5
New Jersey	1.5	0	1	0.5	0	0	1	0	0.5	0.5	5
Rhode Island	1.5	0	1	0.5	0	0.5	1	0	0.5	0	5
Florida	1	0.5	1	0.5	0	0	0	1	0.5	0	4.5
Colorado	0	0.5	0	0.5	0	1	0	1	0.5	0.5	4
Georgia	0	0.5	0	0.5	0	1	0	1	0.5	0.5	4
Michigan	0	0	1	0.5	0	0.5	0.5	1	0.5	0	4
Hawaii	0	0.5	1	0.5	0	0	0	1	0.5	0	3.5
Minnesota	0	0	0	0.5	0	0.5	1	1	0.5	0	3.5
North Carolina	0	0	1	0.5	0	0.5	0	1	0.5	0	3.5
Virginia	0	0	1	0.5	0	0.5	0.5	0.5	0.5	0	3.5

State	GHG tailpipe emissions standards and ZEV program (1.5 pts.)[1]	EV registrations per 100,000 people (0.5 pts.)[2]	Integration of transportation and land use planning (1 pt.)[3]	MAP-21 freight plans and goals (1 pt.)[4]	VMT targets (1 pt.)[5]	Average % change in VMT per capita 2010–2012 (1 pt.)	Transit funding (1 pt.)[6]	Dedicated transit revenue stream statutes (1 pt.)[7]	Complete streets legislation (0.5 pts.)[8]	High-efficiency vehicle consumer incentives (0.5 pts.)[9]	Total score (9 pts.)
Arizona	0	0.5	1	0.5	0	0.5	0	0	0	0.5	3
Tennessee	0	0.5	0	0	0	1	0	1	0.5	0	3
South Carolina	0	0	0	0.5	0	1	0	0	0.5	0.5	2.5
Texas	0	0	0	0.5	0	1	0	0	0.5	0.5	2.5
West Virginia	0	0	0	0	0	1	0	1	0.5	0	2.5
Wisconsin	0	0	0	0.5	0	1	0.5	0	0.5	0	2.5
Alaska	0	0	0	0	0	1	1	0	0	0	2
Iowa	0	0	1	0	0	0	0	1	0	0	2
Puerto Rico	0	0	1	0	0	0	0	0	0.5	0.5	2
Arkansas	0	0	0	0.5	0	0	0	1	0	0	1.5
Kansas	0	0	0	0.5	0	0	0	1	0	0	1.5
New Hampshire	0	0	1	0.5	0	0	0	0	0	0	1.5
North Dakota	0	0	1	0.5	0	0	0	0	0	0	1.5
Utah	0	0	0	0	0	1	0	0	0	0.5	1.5
Wyoming	0	0	0	0.5	0	1	0	0	0	0	1.5
Idaho	0	0	0	0.5	0	0.5	0	0	0	0	1
Indiana	0	0	0	0.5	0	0	0	0.5	0	0	1
Kentucky	0	0	0	0.5	0	0.5	0	0	0	0	1
Louisiana	0	0	0	0	0	0	0	0	0.5	0.5	1
Missouri	0	0	0	0.5	0	0.5	0	0	0	0	1
Nebraska	0	0	0	0.5	0	0.5	0	0	0	0	1
New Mexico	0	0	0	0.5	0	0.5	0	0	0	0	1
Oklahoma	0	0	0	0.5	0	0.5	0	0	0	0	1
Alabama	0	0	0	0.5	0	0	0	0	0	0	0.5

State	GHG tailpipe emissions standards and ZEV program (1.5 pts.)[1]	EV registrations per 100,000 people (0.5 pts.)[2]	Integration of transportation and land use planning (1 pt.)[3]	MAP-21 freight plans and goals (1 pt.)[4]	VMT targets (1 pt.)[5]	Average % change in VMT per capita 2010–2012 (1 pt.)	Transit funding (1 pt.)[6]	Dedicated transit revenue stream statutes (1 pt.)[7]	Complete streets legislation (0.5 pts.)[8]	High-efficiency vehicle consumer incentives (0.5 pts.)[9]	Total score (9 pts.)
Mississippi	0	0	0	0	0	0	0	0	0.5	0	0.5
Montana	0	0	0	0.5	0	0	0	0	0	0	0.5
Nevada	0	0	0	0.5	0	0	0	0	0	0	0.5
South Dakota	0	0	0	0	0	0.5	0	0	0	0	0.5
Guam	0	0	0	0	0	0	0	0	0	0	0
Ohio	0	0	0	0	0	0	0	0	0	0	0
U.S. Virgin Islands	0	0	0	0	0	0	0	0	0	0	0

[1] Clean Cars Campaign 2014.[2] IHS Automotive Polk 2014.[3] State legislation.[4] State legislation.[5] State legislation.[6] AASHTO 2014.[7]State legislation; see Appendix E for a complete description of state transit funding. [8]NCSC 2014. [9] DOE 2014.

Table 23 outlines states' consumer incentives available for the purchase of high-efficiency vehicles.

Table 23. State purchase incentives for high-efficiency vehicles

State	Tax incentive
Arizona	EV owners in Arizona pay a significantly reduced vehicle license tax—$4 for every $100 in assessed value—as part of the state's Reduced Alternative Fuel Vehicle License Tax program.
California	AB 118 targets medium- and heavy-duty trucks in a voucher program whose goal is to reduce the up-front 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 EVs and plug-in hybrid EVs on a first-come, first-served basis, effective until 2023.
Colorado	In 2013, Colorado extended to 2021 its 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. Credits are also available for the purchase of all-electric or plug-in electric medium- and heavy-duty vehicles.
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 ZEV. A ZEV 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 EV (up to $4,000) as part of the Illinois Alternate Fuels Rebate Program.
Louisiana	Louisiana offers an income tax credit equivalent to 50% of the incremental cost of purchasing an EV 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 $3,000 against the vehicle excise tax in the state of Maryland, depending on the battery weight of the vehicle.
Massachusetts	The Massachusetts Offers Rebates for EVs (MOR-EV) program offers rebates of up to $2,500 to customers purchasing plug-in EVs.
New Jersey	All ZEVs 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 $60,000 are available for the purchase of hybrid and all-electric class 3–8 trucks.
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
Puerto Rico	In 2012 Puerto Rico amended the Internal Revenue Code to allow an excise tax reimbursement of up to 65% for buyers of hybrid and plug-in hybrid vehicles. The reimbursement ranges from $2,000 to $8,000 and is available until 2016. Buyers of fully EVs are waived from paying excise tax altogether.
South Carolina	South Carolina offers up to $2,000 in tax credits for the purchase of a plug-in hybrid EV. The credit is equal to $667, plus $111 if the vehicle has at least 5 kWh of battery capacity, and an additional $111 for each additional kWh above 5 kWh.
Texas	EVs weighing 8,500 pounds or less that are purchased after September 1, 2013, are eligible for a $2,500 rebate.
Utah	Until December 31, 2014, EVs qualify for up to $605 in tax credits.
Washington	EVs are exempt from state motor vehicle sales and use taxes under the Alternative Fuel Vehicle Tax Exemption Program.

Source: DOE 2013 for all states except Puerto Rico. Data for Puerto Rico obtained by survey from the Puerto Rico Department of Transportation and Public Works.

Leading and Trending States: Transportation Policies

New York. New York has steadily moved up the ranks in recent years with its strong efforts toward transportation efficiency. On the vehicle efficiency side, in 2013 New York signed a memorandum of understanding with seven other states to put a combined 3.3 million zero-emission vehicles on the road by 2025.This action supplements the California low-emission vehicle emissions standards that were adopted in 2005.

The state has also made a number of changes to improve system efficiency 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 10 years. With one of the highest transit ridership rates in the country, the state in 2010 passed Assembly Bill 8180, 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.

Massachusetts. Massachusetts has long been a leader in the implementation of transportation efficiency policies. The state is dedicated to encouraging compact, transit-oriented development through a number of measures. The Massachusetts 40R program provides financial incentives for the use of zoning overlays that promote smart growth development in cities and municipalities. The state also has a GHG reduction target that aims to reduce transportation emissions by 2 million tons by 2020 and a comprehensive complete streets statute that incorporates pedestrian and bicycle travel in all road construction projects.

In an effort to continue curbing emissions and energy consumption in the transportation sector, Massachusetts adopted the California ZEV program to encourage the adoption of EVs in the state. With approximately 28 EVs registered per 100,000 residents, the state is increasingly making EVs a valid option for drivers.

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 that call for a reduction of 17–21% 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, which calls for all metropolitan planning organizations to 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.

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 legally 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 code development organizations developed the Model Energy Code (MEC), later renamed the International Energy Conservation Code® (IECC). Today, most states use a version of the 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 of North America (IESNA). The IECC commercial building provisions also include prescriptive and performance requirements that largely coincide with ASHRAE requirements.

The most recent versions of the IECC and ASHRAE codes that the Department of Energy (DOE) has certified are the 2012 IECC and the ASHRAE 90.1-2010 standards.[33] Eleven states have officially adopted the latest standards for both residential and commercial buildings: California, Delaware, Florida, Illinois, Iowa, Maryland, Massachusetts, Montana, Nevada, Rhode Island, and Washington.[34] The District of Columbia has also adopted the most recent codes for both commercial and residential buildings. An additional seven states have adopted ASHRAE 90.1-2010 for commercial buildings.[35] A handful of states are in the process of adopting the most recent building energy codes.

Historically, the commercial provisions in the IECC have consistently differed from those in ASHRAE 90.1, and 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 ARRA (see the ARRA section below). Therefore,

[33]New determinations for the 2015 IECC and ASHRAE 2013 were not published in time to be included in the research and writing of this report.

[34]Virginia and Idaho have adopted the 2012 International Residential Code®; however, state-specific amendments make it equivalent to the 2009 IECC.

[35]Idaho, Mississippi, New York, North Carolina, Utah, Virginia, and Oregon

states can adopt either commercial provision and still meet the requirements stipulated in ARRA (DOE 2011b).

DOE Building Code Determinations

With the publication of each new edition of the IECC and ASHRAE standards, DOE issues determinations on the codes that 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 noncompliance, within two years of the final determination states are required to send letters certifying their compliance, requesting an extension, or explaining their decision not to comply.

On May 17, 2012, DOE issued its final determination on the 2012 IECC, reporting that it achieved greater energy efficiency than its predecessors (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, DOE issued its final determination on ASHRAE Standard 90.1-2010, reporting that it achieved greater energy efficiency than the preceding editions by 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 could elect to file a single certification to address both Standard 90.1-2007 and Standard 90.1-2010 determinations. The certification had to be filed by July 20, 2013.[36]

Building Codes and ARRA

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 at least the 2009 IECC and American National Standards Institute/ASHRAE/IESNA Standard 90.1-2007 (hereafter referred to as the ARRA codes).

Forty states, the District of Columbia, and the three U.S. territories (Guam, Puerto Rico, and the U.S. Virgin Islands) have either adopted or are on a clear path toward adopting 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 is under the control of local jurisdictions—that have adopted codes at least equivalent to the ARRA codes.[37] 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

[36]Determinations for the 2015 IECC and ASHRAE 2013 were not published in time to be included in the research and writing of this report.

[37] Home rule decentralizes power, allowing a locality to exercise certain powers of governance within its own administrative area.

either adopted the 2010/2012 code iterations or begun the process toward adoption. While these efforts to adopt stringent building energy codes are laudable, ensuring that states will reap the benefits of their proactivity requires robust implementation and enforcement of the codes. As a result, DOE designated the six regional energy efficiency organizations as support organizations for states in their geographic areas to aid them with their adoption and compliance efforts.[38]

Building Code Compliance and ARRA

ARRA called for each of the 50 states accepting ARRA funding for code implementation and compliance measurement to achieve compliance in 90% of its building stock with the ARRA minimum standard building energy code (2009 IECC for residential; ASHRAE 90.1-2007 for commercial) by 2017. According to our survey results, almost every state in the country has made some modicum of effort to support code compliance, whether a statewide code is mandatory or not. However, for all states to attain the 90% compliance goal, they will have to join utilities and other stakeholders in putting forth a concerted effort involving a variety of facets beyond training and outreach.

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 (CPA) program that "works with states to help them take practical steps toward achieving full compliance with the model energy codes." The CPA program is divided into two phases:

- Phase 1 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 2, 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 CPA 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. NEEA shared its experiences with BCAP, which based its efforts on the Idaho model and supplemented it with its own work in the CPA program. Under that program, 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

[38] The six regional energy efficiency organizations are Northeast Energy Efficiency Partnerships (NEEP), the Southeast Energy Efficiency Alliance (SEEA), the Midwest Energy Efficiency Alliance (MEEA), South-Central Partnership for Energy Efficiency as a Resource (SPEER), the Southwest Energy Efficiency Project (SWEEP), and the Northwest Energy Efficiency Alliance (NEEA). These organizations cover all states except California, Hawaii, and Alaska.

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.

In addition to CPA and compliance collaboratives, states can take other measures to support code compliance to earn points in this policy area. These include:

- 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, and updating the study at least every five 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, and a growing number of states utilize approaches that incorporate most or all of them. Given this, the focus of states between now and 2017, and beyond, should be the thorough evaluation and estimation of rates of compliance. Changes to our scoring methodology reflect this need for a more specific focus on compliance studies, which we discuss below.

Utility Involvement in Building Codes

In several states that have passed EERS policies, programs have been established that allow utilities to claim savings for code enhancement activities, both for adoption and for compliance. 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. They 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. To encourage utilities to participate, prudent regulatory mechanisms such as program cost recovery or shared savings policies must be in place to compensate them for their efforts.

METHODOLOGY AND RESULTS

States earn credit on two measures of building energy codes: the stringency of residential and commercial codes and the level of efforts to support compliance with codes. States can earn a maximum of 5 points for stringency and 2 points for compliance. Although our metrics for evaluating state compliance and enforcement efforts have not changed, we have shifted the allocation of points to award more credit to states that have completed compliance studies in the last five years. Our thought is that, as we approach the 2017 deadline for 90% compliance, a state's code enforcement efforts will be reflected in its compliance rates. So while it is important for states to incorporate these various compliance strategies, the paramount concern is whether

or not new construction is actually complying with the state-mandated building energy codes. Currently, 33 states have completed compliance studies at some point, though only 26 states have completed a study in the last five years.

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 Building Energy Codes Program and the expert knowledge of several individuals who are active in state building energy code policy and evaluation. Very recent code adoptions may not be captured by OCEAN or DOE, 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 points each for residential and for commercial building energy codes, with 2.5 being assigned to the most stringent codes (see table 24), for a total of 5 possible points for building code stringency. For detailed information on building code stringency in each state, visit ACEEE's State and Local Policy Database or see Appendix G (ACEEE 2014).

A handful of 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 by September 1, 2015. 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 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.

We also awarded credit to 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. Some of these 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, in part because of a lack of consistent data across states, but we have flagged this for incorporation into the next iteration of our State Scorecard.

Table 24. Scoring methodology for stringency of state residential and commercial building energy codes

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	2.0
Meets or exceeds 2009 IECC or equivalent	Meets or exceeds 2009 IECC or equivalent or ASHRAE 90.1-2007 or equivalent	1.5
Meets or exceeds 1998–2006 MEC/IECC (meets EPCA[39]) 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	1.0
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 Energy Policy Act of 1992)	No mandatory state energy code or precedes ASHRAE 90.1-1999 or equivalent (does not meet Energy Policy Act of 1992)	0

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 consistent data on actual compliance rates and the fact that other efforts taken to measure compliance are largely qualitative. However, ARRA requires that states achieve 90% compliance with mandated codes by 2017, so our compliance scoring methodology will change somewhat every year for the next four to five years to reflect an increasing emphasis on the quantitative aspect of this requirement. The number of states that have estimated actual compliance rates is slowly increasing, and eventually ACEEE intends to award credit to states based on the publication of compliance studies, the rigor of those studies, and the actual level of compliance reported in those studies in order to provide motivation for states to reach the 90% compliance goal and above. By gradually decreasing the relative scoring weight of the qualitative compliance activities and allocating more points to measuring compliance, we are not implying that the qualitative activities are unimportant, but that states that are achieving high rates of compliance are likely incorporating most if not all of these activities into their compliance/enforcement efforts.

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 on their efforts to measure and enforce code compliance. We have grouped the metrics to convey our focus on compliance studies versus qualitative compliance activities. Table 25 shows the various compliance metrics and the scoring methodology for measuring state compliance efforts. A total of 2 points is possible: A state receives 1 point for simply having conducted a compliance study in the past five years, regardless of whether or not that study has been

[39] Under the federal Energy Policy and Conservation Act (EPCA), each state is 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.

updated during that time. A state can then earn an additional 0.5 points for engaging in one or two of the compliance metrics, and another 0.5 points for engaging in an additional one or two of the compliance metrics, so that those states that engage in three or four of the compliance metrics earn a full point for their efforts.

For more information on state compliance efforts, visit ACEEE's State and Local Policy Database or see Appendix H (ACEEE 2014).

Table 25. Scoring methodology for state compliance efforts

Metrics for state compliance efforts
Compliance study completed in last five years
Assessments/gap analysis/strategic compliance plan
Stakeholder advisory group/compliance collaborative
Utility involvement
Training and outreach

Number of compliance metrics achieved	Score (2 pts.)
Compliance study	+1
3–4	+0.5
1–2	+0.5

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

Table 26. Scoring for state building energy codes: stringency and 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
Delaware*	2	2	2	6
Florida	2	2	2	6
Illinois	2	2	2	6
Iowa	2	2	2	6
Maryland	2	2	2	6
Montana	2	2	2	6
Nevada*	2	2	2	6
Rhode Island	2	2	2	6
Vermont*	2	2	2	6
Washington	2	2	2	6
Idaho*	1.5	2	2	5.5
Massachusetts	2	2	1.5	5.5
New York	1.5	2	2	5.5
Oregon	1.5	2	2	5.5
Colorado	1.5	1.5	2	5
Connecticut	1.5	1.5	2	5
District of Columbia	2.5	2	0.5	5
Nebraska	1.5	1.5	2	5
Virginia	1.5	2	1.5	5
Kentucky*	1.5	2	1	4.5
Minnesota*	2	1	1.5	4.5
Utah	1	2	1.5	4.5
Guam	1.5	1.5	1	4
Kansas	1.5	1	1.5	4
New Hampshire	1.5	1.5	1	4
New Mexico	1.5	1.5	1	4
North Carolina	1.5	2	0.5	4
Ohio	1.5	1.5	1	4
Pennsylvania	1.5	1.5	1	4
Texas	1.5	1.5	1	4
West Virginia	1.5	1.5	1	4
Wisconsin	1	1.5	1.5	4
Alabama	1.5	1.5	0.5	3.5
Georgia	1.5	1.5	0.5	3.5
Indiana	1.5	1.5	0.5	3.5

State	Residential code stringency (2.5 pts.)	Commercial code stringency (2.5 pts.)	Compliance (2 pts.)	Score (7 pts.)
Louisiana	1.5	1.5	0.5	3.5
Maine	1	1	1.5	3.5
Michigan	1.5	1.5	0.5	3.5
Mississippi	0	2	1.5	3.5
Oklahoma	1.5	1.5	0.5	3.5
Puerto Rico	1.5	1.5	0.5	3.5
South Carolina	1.5	1.5	0.5	3.5
U.S. Virgin Islands	1.5	1.5	0.5	3.5
Arizona	1.5	1	0.5	3
Arkansas	1	1.5	0.5	3
New Jersey	1.5	1.5	0	3
Hawaii	1	1	0.5	2.5
Missouri	1	1	0.5	2.5
Tennessee	1	1	0.5	2.5
North Dakota	0.5	0.5	0.5	1.5
South Dakota	0.5	0.5	0.5	1.5
Wyoming	0.5	0.5	0.5	1.5
Alaska	0.5	0	0.5	1

* These states have signed or passed legislation mandating compliance with a new iteration of codes effective by September 1, 2015, 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.
Sources: Stringency scores derived from data request responses, DOE Building Energy Codes Program (DOE 2014), and discussions with code experts, as of August 2014. Compliance and enforcement scores are based on information gathered in surveys of state building energy code contacts. See the ACEEE State and Local Policy Database for more information on state codes and compliance (ACEEE 2014).

Compared to the 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. Illinois and Maryland were the first to adopt these codes in 2012. This year, only California was awarded the maximum score of 7 points, though several states achieved scores of 6 points due to a combination of stringent energy codes and laudable compliance efforts.

Nine states lack mandatory statewide energy codes for either residential or commercial new construction or for both: Alaska, Arizona, Colorado, Kansas, Mississippi, Missouri, North Dakota, 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

Authors: David Ribeiro, Anna Chittum, and Kate Farley

INTRODUCTION

Combined heat and power (CHP) systems generate electricity and thermal energy in a single integrated system. 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, process, or water supply. CHP systems can save customers money and reduce overall net emissions. The majority of CHP systems are powered by natural gas, but many are fueled by biomass, biogas, or other types of fossil fuels.

A state could earn up to 5 points based on 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 eight factors considered when scoring CHP for the 2014 State Scorecard were

- Standard interconnection rules
- Inclusion of CHP in a state EERS
- Inclusion of CHP/waste heat recovery in a state RPS or other standard
- Favorable revenue streams, including wholesale net metering, feed-in tariffs, or standard offer programs
- Applicable financial incentive programs
- Loan and loan guarantee programs
- Output-based air emissions regulations
- Any additional supportive policies

We also assessed, but did not score, two additional factors in the 2014 State Scorecard:

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

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 had been enacted by a legislative body or promulgated as an order from an agency or regulatory body. Some states that had policies in place have since removed or in other ways nullified them; in these situations, we did not give credit for the policy in question. For example, although Ohio has received credit for including CHP as an allowable resource within its EERS in the past, the rollback of that policy meant that it did not receive points this year. Policies in place as of August 2014 were considered for this review.

METHODOLOGY

We continued to use, with some modifications, the methodology that we developed for the State Scorecard in 2012. This chapter includes a brief explanation of our scoring criteria for each

category. For an in-depth discussion of our methodology, see the ACEEE white paper *CHP Methodology in the 2012 Scorecard* (Chittum 2012).The maximum combined score is 5 points.

Interconnection Standards

States could receive up to 1 point for having an interconnection standard that explicitly established parameters and procedures for the interconnection of CHP systems. We relied on secondary sources—such as the Database of State Incentives for Renewables and Efficiency (DSIRE 2014) and EPA's CHP Partnership database (EPA 2014b)—as well as primary sources such as public utility commission dockets and responses to data requests. To receive a top score, a state's interconnection standards needed to

- Be adopted by all major utilities
- 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 over 10 MW

States that have interconnection standards that apply to systems only up to 10 MW but otherwise meet the above criteria obtained half credit.

Having multiple levels (or tiers) of interconnection is important to CHP deployment because smaller systems offer a faster—and often cheaper—path toward interconnection than larger systems. 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 developers, as are standards that are based on widely accepted technical industry standards, such as the IEEE 1547 standard.[40]

CHP Inclusion in EERS Policies

We awarded up to 1 point for CHP's eligibility in an EERS. EERS policies define a particular amount of a state's electric resources that must be derived from energy efficiency resources. Most states with EERS policies set goals for future years. These goals are generally a percentage of total electricity sold that must be derived from efficiency resources, with the percentage of these resources increasing as a percentage of total electricity sold in future years. Not only are utilities required to meet the state goals, but also standards are often paired with utility incentives or support programs to implement and encourage eligible technologies. Thus, when CHP is explicitly listed as eligible for EERS credit, it creates a large incentive to deploy CHP systems. To receive full credit, state EERSs must

- Explicitly apply to CHP powered by natural gas
- Treat CHP as a resource in the top tier or category
- Establish specific CHP targets

[40] 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.

- Be binding, including penalties for utilities that do not meet goals

Half a point was awarded to states that met the above criteria, but did not establish any specific targets for CHP within their EERSs.

CHP Inclusion in RPS Policies

We awarded 0.5 points for CHP's eligibility in an RPS. In previous years we assigned a single point for both EERS and RPS policies; this year we separated the two to emphasize the importance of EERS policies and to note the different roles the two standards can play. As with EERSs, most states with RPS policies set goals for future years that require a percentage of the total electricity sold to be derived from renewable resources. To receive full credit, state RPSs must

- Explicitly define waste heat–, biomass-, or biogas-powered CHP as an eligible resource
- Be binding, and include penalties for utilities that do not meet goals

Favorable Revenue Streams

We awarded up to 0.5 points for the presence of favorable revenue streams that apply to CHP. In the past, we scored states based only on their net metering policies. However, this year we wanted to emphasize additional policies such as favorable feed-in tariffs and standard offer programs. Sound net metering regulations allow owners of small distributed generation systems to get credit for excess electricity that they produce on-site. With wholesale net metering, which is sometimes referred to as dual metering, utilities pay customers at the wholesale avoided cost rate for any excess electricity exported to the grid. We gave credit to states that offered at least wholesale net metering to all customer classes, and specifically offered it to natural gas–fired CHP systems. States where CHP systems were being paid solely as qualified facilities under the Public Utility Regulatory Policies Act (PURPA) Section 210 did not receive credit in this category, as PURPA is a federal law and its applicability has been diminished in a number of states. Additionally, states where certain CHP systems are receiving some credit for their power production only through bespoke bilateral contracts did not receive credit. In order to receive credit in this category, a specific policy that was relevant and applicable to all customers had to be in place. Feed-in tariffs are usually a payment CHP operators receive in addition to payment for exporting electricity to the grid, providing additional incentive for investment in CHP. To receive credit for revenue streams, states must have at least one of the following policies:

- A statewide wholesale net metering policy that can be used by all customer classes and applies to CHP systems powered by natural gas
- A statewide feed-in tariff policy that applies to CHP powered by natural gas
- Any other state program that offers wholesale prices for natural gas–powered CHP, such as a standard offer program

See Appendix I for the revenue streams that earned points.

Incentives for CHP

States could also receive up to 0.5 points for incentives for CHP. Incentives can include per-kW or per-kWh production incentives or project-based grants. They can also include tax incentives,

which are usually 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. To be eligible for 0.5 points, at least one available incentive must

- Apply to all CHP, regardless of fuel
- Be a production credit, an investment credit, a credit for installed capacity, or a grant
- Apply to both the commercial and industrial sectors

In general, ratepayer-funded custom incentives marketed to commercial and industrial sectors that could *potentially* be used for CHP were not given credit in this area, as the spending and savings for these programs are reflected in other parts of the State Scorecard. However, if programs had a specific CHP-focused component, such as the identification of and outreach to appropriate contenders for CHP, they were credited. Additional information on incentives for CHP is available from EPA through its CHP Partnership (EPA 2014b) and from the Database of State Incentives for Renewables and Efficiency (DSIRE 2014).

Financing Assistance

States could receive up to 0.5 points 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 a top score, key programs must be available to all forms of CHP and be substantial enough that they can truly be used by a CHP project. Additionally, CHP had to be clearly identified as an eligible target project type.

See Appendix I for more detailed descriptions of state incentives and financing programs that received credit in this chapter.

Emissions Treatment

We also awarded 0.5 points 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 on 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

- A fast-track CHP permitting process in place for sulfur oxides and/or nitrogen oxides
- Output-based parameters for all major applicable air permits

Additional information on policies in this category is also available from EPA via its CHP Partnership website (EPA 2014b).

Other Supportive Policies

We also awarded 0.5 points for other supportive policies. Such policies can include targeted 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 CHP section of the ACEEE State and Local Policy Database (ACEEE 2014).

RESULTS

Table 27 lists each state's total and its point distribution in each of the above categories. As was the case last year, no state received the full 5 points. Connecticut and Massachusetts, the latter of which was last year's top scorer, both received the top score this year, 4.5 points. They were two of only four states—the others being Rhode Island and California—to have EERSs that included specific targets for CHP. Neither Connecticut nor Massachusetts earned credit in the revenue stream metric this year. Rounding out the top four were California with 4 points and Oregon with 3.5. Both California and Oregon have regularly made efforts to include CHP in new policies and to assess how they could better meet their CHP potential. Unfortunately, some states allowed policies that are favorable to CHP to expire, resulting in a lower average score across all states compared to last year.

Table 27. State scores for CHP

State	Inter-connection standard (1 pt.)	EERS treatment (1 pt.)	RPS treatment (0.5 pts.)	Revenue streams (0.5pts.)	Incentives (0.5 pts.)	Financing (0.5 pts.)	Emissions treatment (0.5 pts.)	Other policies (0.5 pts.)	Score (5 pts.)
Connecticut	1	1	0.5	0	0.5	0.5	0.5	0.5	4.5
Massachusetts	1	1	0.5	0	0.5	0.5	0.5	0.5	4.5
California	1	1	0.5	0.5	0.5	0	0.5	0	4
Oregon	1	0.5	0.5	0	0.5	0	0.5	0.5	3.5
Maine	1	0	0.5	0.5	0	0	0.5	0.5	3
Maryland	0.5	0.5	0.5	0.5	0.5	0	0	0.5	3
Rhode Island	0.5	1	0	0	0.5	0	0.5	0.5	3
Vermont	1	0.5	0.5	0.5	0.5	0	0	0	3
North Carolina	1	0.5	0.5	0	0.5	0	0	0	2.5
Washington	1	0.5	0.5	0.5	0	0	0	0	2.5
Wisconsin	1	0	0.5	0.5	0	0	0	0.5	2.5
Arizona	0	0.5	0.5	0.5	0.5	0	0	0	2
New Jersey	0	0	0	0	0.5	0.5	0.5	0.5	2
New York	0	0	0.5	0.5	0.5	0	0	0.5	2
D.C.	0.5	0	0	0.5	0.5	0	0	0	1.5
Illinois	1	0.5	0	0	0	0	0	0	1.5
Michigan	1	0	0.5	0	0	0	0	0	1.5
Minnesota	0.5	0.5	0	0.5	0	0	0	0	1.5
New Hampshire	0	0	0.5	0.5	0	0	0.5	0	1.5
New Mexico	1	0	0	0.5	0	0	0	0	1.5
Ohio	1	0	0	0	0.5	0	0	0	1.5
Texas	0.5	0	0	0	0	0	0.5	0.5	1.5
Utah	1	0	0	0	0.5	0	0	0	1.5

State	Inter-connection standard (1 pt.)	EERS treatment (1 pt.)	RPS treatment (0.5 pts.)	Revenue streams (0.5pts.)	Incentives (0.5 pts.)	Financing (0.5 pts.)	Emissions treatment (0.5 pts.)	Other policies (0.5 pts.)	Score (5 pts.)
Colorado	0	0	0.5	0.5	0	0	0	0	1
Florida	0	0	0	0.5	0.5	0	0	0	1
Hawaii	0.5	0	0.5	0	0	0	0	0	1
Indiana	1	0	0	0	0	0	0	0	1
Nevada	0	0.5	0.5	0	0	0	0	0	1
Pennsylvania	0	0	0.5	0.5	0	0	0	0	1
West Virginia	0	0	0.5	0.5	0	0	0	0	1
Alaska	0	0	0	0	0.5	0	0	0	0.5
Delaware	0	0	0	0	0	0	0.5	0	0.5
Idaho	0	0	0	0	0	0.5	0	0	0.5
Iowa	0.5	0	0	0	0	0	0	0	0.5
Louisiana	0	0	0	0	0	0	0	0.5	0.5
North Dakota	0	0	0	0.5	0	0	0	0	0.5
Oklahoma	0	0	0	0.5	0	0	0	0	0.5
South Dakota	0.5	0	0	0	0	0	0	0	0.5
Alabama	0	0	0	0	0	0	0	0	0
Arkansas	0	0	0	0	0	0	0	0	0
Georgia	0	0	0	0	0	0	0	0	0
Guam	0	0	0	0	0	0	0	0	0
Kansas	0	0	0	0	0	0	0	0	0
Kentucky	0	0	0	0	0	0	0	0	0
Mississippi	0	0	0	0	0	0	0	0	0
Missouri	0	0	0	0	0	0	0	0	0
Montana	0	0	0	0	0	0	0	0	0
Nebraska	0	0	0	0	0	0	0	0	0
Puerto Rico	0	0	0	0	0	0	0	0	0
South Carolina	0	0	0	0	0	0	0	0	0
Tennessee	0	0	0	0	0	0	0	0	0
U.S. Virgin Is.	0	0	0	0	0	0	0	0	0
Virginia	0	0	0	0	0	0	0	0	0
Wyoming	0	0	0	0	0	0	0	0	0

Few notable policies have been enacted to enhance CHP's attractiveness to CHP developers in the year since the 2013 State Scorecard was published. However, there were some noteworthy policies adopted in early 2013 and some focused state actions to support CHP, and we describe a sampling of them below.

Leading and Trending States in Policies to Encourage CHP Development

Maryland. Several investor-owned utilities in Maryland operate successful CHP programs. For example, in 2013 the Baltimore Gas and Electric Company (BG&E) launched a new CHP program to encourage its use by commercial and industrial customers. The program provides up to $2 million in assistance for each preapproved CHP project through a series of design, installation, and production incentives. The program is one of the utility's EmPOWER Maryland efficiency programs to achieve statewide energy savings targets. The program was well received by commercial and industrial customers, and the utility is beginning its second round of funding, for projects that will be in place by 2016.

Oregon. Oregon's Department of Energy has continued to identify CHP as a critical energy efficiency resource that is particularly well suited to the biomass resources of the state. In addition to supporting an updated statewide assessment of CHP potential, the state also has specifically targeted the food processing and forest product sectors for future CHP development. To support CHP goals, the state administers a dedicated competitive CHP incentive program that can fund up to 35% of project cost.

Rhode Island. Recognizing the many benefits of CHP beyond energy savings, Rhode Island requires its main utility, National Grid, to develop and implement a CHP-focused plan each year. These plans are to incorporate specific capacity targets, incentive offerings, and efforts to identify appropriate CHP candidates. Additionally, when calculating the cost-effectiveness of CHP projects, National Grid must consider the projects' additional benefits, such as their economic development value, emissions benefits, and the enhanced reliability benefits to the grid.

Additional Metrics

There are two additional sets of factors that are noted but do not factor into a state's score.

We include data on the number of individual CHP systems installed in each state in the past two years, as well as the total capacity installed in each state in each of the past two years.[41] CHP systems often take a long time to plan and install, so a single year may not best reflect the CHP activity of each state. We believe such information is useful for comparing states, though it is not, in its own right, a full indicator of a state's CHP friendliness. Economic factors well beyond the control of a state may strongly impact the degree to which CHP projects are installed. Future editions of the State Scorecard may score states on their installed CHP as compared to some measure of technical or economic potential.

Finally, the retail electric and natural gas rates paid by facilities in a given state can have significant impacts on the overall economics of a CHP system. 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 some states. A recent analysis of state-by-state CHP resource potential performed for a study looking at carbon reduction potential from energy efficiency clearly demonstrates these state differences (Hayes et al. 2014). The fact that these prices do not enter

[41] We use data from ICF International's CHP database (2014), which is being updated to include CHP units installed in 2013. Therefore there may be some new CHP systems that are not included here. For the most up-to-date numbers, see http://www.eea-inc.com/chpdata/.

into each state's ranking recognizes that a state cannot directly control the retail price of electricity or gas to customers. However, the prices of electricity and gas directly drive a state's CHP market to varying degrees, and policymakers can implement policies that help overcome economic barriers erected in part by lower electricity prices or higher gas prices. Table 28 shows the industrial retail prices of both electricity and natural gas, reflecting the fact that the largest opportunity for CHP remains in the industrial sector.

Table 28. Installed CHP capacity and fuel prices by state, 2012–13

State	Number of new CHP installations in 2013	Total new capacity installed in 2013 (kW)	Number of new CHP installations in 2012	Total new capacity installed in 2012 (kW)	2013 industrial electricity price (cents/kWh)	2013 industrial gas price ($/1,000 cubic ft.)
Alabama	0	0	1	500	5.99	5.00
Alaska	2	770	7	16,750	15.77	5.11*
Arizona	0	0	3	1,036	6.69	6.32
California	32	50,322	62	214,505	11.17	5.77*
Colorado	0	0	5	33,330	7.22	5.76
Connecticut	10	3,000	11	18,560	12.68	6.85
Delaware	1	104,000	0	0	8.50	11.61*
Florida	1	5,400	3	32,500	7.68	6.96*
Georgia	2	41,100	1	6,500	6.11	5.28
Hawaii	0	0	1	60	29.87	27.81
Idaho	0	0	4	10,765	6.12	5.73*
Illinois	1	138	3	3,110	5.73	5.91
Indiana	1	1,200	1	15,000	6.59	6.19*
Kansas	0	0	1	30	7.07	4.87
Louisiana	0	0	2	51,400	5.89	3.91
Maine	3	610	3	53,630	8.32	10.35*
Maryland	1	24,500	0	0	8.36	8.01*
Massachusetts	10	12,920	10	4,245	13.09	9.82*
Michigan	3	101,095	1	1,000	7.78	6.89
Minnesota	1	300	0	0	7.06	5.09
Missouri	1	16,000	1	5,000	6.14	7.93*
Montana	1	2,500	0	0	5.37	7.37
Nevada	0	0	1	11,000	6.52	6.55
New Hampshire	1	80	0	0	11.41	10.42
New Jersey	9	6,405	13	36,600	10.71	7.87*
New York	30	15,712	33	19,489	6.29	6.92*
North Carolina	3	1,900	9	17,395	6.34	6.37*
Ohio	2	195	5	1,980	6.10	5.33
Oklahoma	0	0	1	15,000	5.34	6.87
Oregon	2	1,650	6	18,550	5.86	5.69

State	Number of new CHP installations in 2013	Total new capacity installed in 2013 (kW)	Number of new CHP installations in 2012	Total new capacity installed in 2012 (kW)	2013 industrial electricity price (cents/kWh)	2013 industrial gas price ($/1,000 cubic ft.)
Pennsylvania	11	18,635	12	20,080	7.00	9.58*
Rhode Island	0	0	2	110	11.87	9.78*
South Carolina	4	19,808	2	20,800	5.92	5.35
Tennessee	1	128	0	0	6.44	5.70
Texas	2	810	4	342,820	5.93	3.93
Utah	0	0	1	3,200	5.88	5.32
Vermont	0	0	4	1,040	10.19	5.02
Virginia	4	79,380	0	0	6.65	5.29*
Washington	1	20,000	3	6,350	4.22	8.77*
West Virginia	0	0	1	390	6.20	3.56
Wisconsin	9	67,754	7	5,287	7.54	5.98
Wyoming	0	0	1	3,900	6.41	4.87*

Only states with CHP installations completed in 2012 or 2013 are included in this table. Those with no new CHP installations in either year are not reported. *The industrial gas prices were not available for some states. The prices displayed for these states are the 2012 industrial gas prices. *Sources:* ICF 2014; EIA 2014a; EIA 2014b.

Chapter 6. State Government-Led Initiatives

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INTRODUCTION

State legislatures and governors can advance policies and programs that affect 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.

ARRA channeled nearly $80 billion through DOE for clean energy projects, a significant portion of which was passed through to states for energy efficiency projects (DOE 2013). 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 as 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 and 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 up-front 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 at the state level, with only California, Washington, and the District of Columbia requiring energy-use disclosure upon sale or lease (IMT 2014). 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 for improving 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 locating 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.[42] Adding a third type of initiative, benchmarking energy use in public-sector buildings through tailored or widely available tools such as the EPAENERGY STAR® Portfolio Manager ensures a comprehensive set of energy-use data that can drive cost-effective energy efficiency investments.[43] Comparing building energy performance across agencies can also help prioritize energy efficiency projects.

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

[43] Some states have their own databases of public building energy use that integrate with the EPA Portfolio Manager. For example, Maryland's EnergyCap database 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.

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 nationwide, 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 GHG emissions.

Research and Development

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 failures 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 R&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 R&D programs. A diverse set of institutions (including universities, state governments, research centers, and utilities) fund and implement R&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.

Individual state research institutions provide expertise and knowledge policymakers can draw from in order to advance successful efficiency programs. These institutions provide the R&D needed to spur commercial investment in and manufacturing of new energy-efficient technologies. State research institutions enable valuable knowledge spillover to other states through the sharing of information—facilitated through membership in ASERTTI—allowing states to benefit from one another's research. States without R&D institutions can use this shared information as a roadmap 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.

ARRA and State Governments

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 DOE Office of Energy Efficiency and

Renewable Energy (DOE 2013).[44] 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 made available to state and local governments

Program	Budget prior to Recovery Act (FY 2008)	Recovery Act funding (FY 2009–2012)
Weatherization Assistance Program	$227 million	$5 billion
State Energy Program	$33 million*	$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	$11.2billion

Note that funding levels have now returned to 2008 levels, although states continue to leverage unspent funds.* Required states to contribute funds worth 20% of the DOE grant toward energy projects supported by the grant. *Source:* DOE 2013.

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, DOE, and lending institutions, in particular community development 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 et al. 2011). In order to receive and spend funding provided through DOE's Energy Efficiency and Conservation Block Grants, local governments have developed knowledge of and staff capacity to implement energy efficiency projects, providing a solid foundation for future programs. And as ARRA funds are spent, states have begun prioritizing energy efficiency programs and incentives in their own capital budgets.

METHODOLOGY AND RESULTS

States could earn up to 7 points in this policy area: 2.5 points for financial incentives, 1 point for residential and commercial disclosure policies, 2 points for lead-by-example policies, and 1.5 points for R&D programs. Table 30 presents the overall results of scoring on state initiatives.

[44] An additional $15 billion was allocated to programs and projects under which funding could be used for energy efficiency improvements, among numerous other modernization or renovation measures.

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.)	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
Illinois	2.5	0	2	1	5.5
Minnesota	2	0	2	1.5	5.5
Oregon	2.5	0	1.5	1.5	5.5
Maryland	2.5	0	1.5	1	5
Massachusetts	2.5	0	1.5	1	5
Pennsylvania	2.5	0	1	1.5	5
Alabama	2	0	2	0.5	4.5
Alaska	2.5	0.5	1	0.5	4.5
Delaware	2.5	0	2	0	4.5
Kansas	1.5	0.5	1.5	1	4.5
Kentucky	2.5	0	1.5	0.5	4.5
Michigan	2	0	1.5	1	4.5
North Carolina	1	0	2	1.5	4.5
Tennessee	2.5	0	1	1	4.5
Washington	1.5	0.5	2	0.5	4.5
Colorado	1.5	0	1	1.5	4
Texas	1	0	2	1	4
Vermont	2	0	1.5	0.5	4
Virginia	2.5	0	0.5	1	4
Wisconsin	1	0	1.5	1.5	4
Idaho	2.5	0	0.5	0.5	3.5
Iowa	1.5	0	1	1	3.5
Montana	1.5	0	2	0	3.5
Nevada	1.5	0	1.5	0.5	3.5
New Mexico	1.5	0	2	0	3.5
Ohio	2	0	1	0.5	3.5
Oklahoma	2.5	0	1	0	3.5
Utah	1	0	2	0.5	3.5
Arizona	1	0	1	1	3
Maine	0.5	0.5	1.5	0.5	3
Mississippi	1	0	1.5	0.5	3
Nebraska	1	0	0.5	1.5	3
Rhode Island	1	0	1.5	0.5	3

State	Financial incentives (2.5 pts.)	Building energy disclosure (1 pt.)	Lead by example (2 pts.)	R&D (1.5 pts.)	Score (7 pts.)
South Carolina	1.5	0	1.5	0	3
District of Columbia	0.5	0.5	1	0.5	2.5
Florida	0	0	1	1.5	2.5
Georgia	0	0	1.5	1	2.5
Hawaii	0	0.5	1.5	0.5	2.5
Missouri	1	0	1.5	0	2.5
New Hampshire	1.5	0	1	0	2.5
New Jersey	1	0	1	0.5	2.5
Puerto Rico	0	0	1.5	0.5	2
Arkansas	0	0	1.5	0	1.5
Louisiana	0.5	0	1	0	1.5
South Dakota	0.5	0.5	0.5	0	1.5
Wyoming	1	0	0.5	0	1.5
Indiana	0.5	0	0.5	0	1
West Virginia	0	0	0.5	0.5	1
Guam	0	0	0.5	0	0.5
North Dakota	0.5	0	0	0	0.5
U.S. Virgin Islands	0	0	0.5	0	0.5

While many of the programs in this section rely on federal grants for a portion of their funding, state programs funded solely through ARRA or another federal source did not earn points. 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. However, for ACEEE to complete an assessment of a state's handling of stimulus funds, we would have to rely on fluctuating spending data, which rests outside the scope of this report. Examples of exemplary ARRA-funded programs are presented in Sciortino and Eldridge (2010), on DOE's Weatherization and Intergovernmental Programs Office website (http://www1.eere.energy.gov/wip/recovery_act.html), and in publications of the National Association of State Energy Officials (NASEO 2011).

Financial Incentives

We relied primarily on the Database of State Incentives for Renewables and Efficiency (DSIRE 2014) for information on current state financial incentive programs. We supplemented this data with information from a survey of state energy officials and from 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. Nor were they given for programs solely funded by ARRA (see table 29). Acceptable sources of funding included state appropriations or bonds, oil overcharge revenues, auction proceeds from the Regional Greenhouse Gas Initiative or California's Cap-and-Trade Program, other noncustomer sources, and tax incentives. 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.

States earned up to 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.[45] Incentive programs generally received 0.5 points each, but several states have major incentive programs that were deemed worth 1 point each; these include Alaska, Idaho, Iowa, Kansas, Nebraska, Texas, Washington, and Wisconsin. Table 31 describes the bases for our scoring of state financial incentives.

There are limitations in scoring states based on the number of programs implemented, so this year we attempted to collect additional information from state energy offices regarding state budgets for financial incentives, program participation rates, verified savings from incentives, and leveraging of private capital. For more information, see the end of this chapter for a discussion of potential new metrics for state-led initiatives.

[45] 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 at this time.

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), loan/grant 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
Connecticut	One rebate, one loan, and one grant program, sales tax exemption for energy-efficient products, Clean Energy Communities incentive program	2.5
Delaware	Three loan programs, two grant programs, and 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
Illinois	Multiple grant programs, three rebate, one 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, five loan programs, one rebate program	2.5
Massachusetts	Alternative Energy and Energy Conservation Patent Exemption (personal and 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
Oklahoma	Energy Efficient Residential Construction Tax Credit (personal and corporate), three loan programs	2.5
Oregon	Residential energy tax credit, 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
Virginia	Energy Leasing Program for state-owned facilities, Clean Energy Manufacturing Grant Program, one loan program, personal and property tax incentives	2.5
Alabama	Two state-funded loan programs, AlabamaWISE Home Energy Program (rebates and loans)	2
Michigan	Two loan programs, AgriEnergy Program, one rebate program	2
Minnesota	Four loan programs	2
Ohio	Energy Loan Fund and one other loan program, property tax exemption for energy-efficient projects	2
Vermont	Two loan programs, Weatherization Trust Fund, Thermal Energy and Process Fuel Efficiency Program	2
Colorado	Mortgage discount for ENERGY STAR homes, loan loss reserve 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
Montana	Energy conservation installation tax credit, tax deduction for energy-conserving investment, one loan program	1.5

State	Major state financial incentives for energy efficiency	Score (2.5 pts.)
Nevada	Wide-reaching property tax abatement for green buildings, Home Energy Retrofit Opportunities for Seniors program	1.5
New Hampshire	Two loan programs (Business Energy Conservation Revolving Loan Fund and Municipal Energy Reduction Fund), one rebate program	1.5
New Mexico	Sustainable Building Tax Credit (personal and 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
Washington	Major grant program for energy efficiency in public facilities and local communities, Washington Farm Energy Program	1.5
Arizona	Property tax exemption for energy-efficient building components	1
Mississippi	One loan program, one public-sector lease program for energy-efficient equipment	1
Missouri	Two loan programs	1
Nebraska	Major loan program (Dollar and Energy Saving Loans)	1
New Jersey	Edison Innovation Clean Energy Manufacturing Fund (grants and loans), Edison Innovation Green Growth Fund loan program	1
North Carolina	One rebate and one loan program	1
Rhode Island	Home Energy Assistance Loan Program, School Grant Program	1
Texas	Major loan program (Texas LoanSTAR)	1
Utah	Two loan programs for state-owned buildings and schools	1
Wisconsin	Major loan program (Clean Energy Manufacturing Loan Program)	1
Wyoming	One grant and one loan program	1
District of Columbia	One rebate program	0.5
Indiana	One rebate program	0.5
Louisiana	Home Energy Loan Program	0.5
Maine	One loan program	0.5
North Dakota	One grant program	0.5
South Dakota	One loan program	0.5
Arkansas	None	0
Florida	None	0
Georgia	None	0
Guam	None	0
Hawaii	None	0
Puerto Rico	None	0
U.S. Virgin Islands	None	0
West Virginia	None	0

Leading and Trending States for Financial and Information Incentives

Connecticut. Connecticut offers many state-level financial incentives that target a variety of sectors. In 2013, the state's green bank, the Clean Energy Finance and Investment Authority (CEFIA), deployed public and private capital into the residential, commercial, industrial, and municipal sectors through several products, including Smart-E Loans and the Connecticut Property Assessed Clean Energy (C-PACE) program. Of particular note, CEFIA recently completed the first-in-the-country C-PACE securitization, auctioning off the first $30 million of C-PACE projects. Proceeds will be used in part to fund additional C-PACE transactions in the commercial buildings market.

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.

Building Energy-Use Disclosure Requirements

Disclosure policies require commercial and/or residential building owners to disclose building energy assessments, such as past energy consumption data or energy asset ratings, 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 2014). States with energy-use disclosure laws in place received 0.5 points each for commercial or residential policies. States with both policies in place received 1 point.

Several states have taken the lead in requiring building energy-use disclosure, but no additional states have adopted disclosure policies since our scoring last year. No states currently require both commercial and residential disclosure, although 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. More often, these policies are pursued by local-level jurisdictions; most recently, a commercial benchmarking ordinance was adopted in Montgomery County, Maryland.[46] State disclosure policies are presented in table 32.

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

Table 32. State disclosure policies

State	Disclosure type	Building energy-use disclosure requirements	Score (1 pt.)
Alaska	Residential	Alaska statute AS34.70.101 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 are 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 multifamily 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 for 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 to be disclosed to a prospective buyer, lessee, or lender.	0.5

Disclosure policies based on IMT 2014.[1]Jim Flanagan Associates 2013.

State Energy Disclosure Policies: Leading States

Kansas: In 2003, Kansas passed a law requiring the disclosure of energy efficiency information for 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: Starting in 2014, all commercial and multifamily buildings over 50,000 square feet are 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 2014), a survey of state energy officials, and independent research. States could earn up to 2 points in the lead-by-example category: 0.5 points for energy savings targets in new and existing state buildings, 0.5 points for a benchmarking requirement for public facilities, 0.5 points for energy savings performance contracting activities, and 0.5 points for fleet fuel efficiency mandates.

Energy savings targets must commit state government facilities to a specific energy reduction goal over a distinct time period. The adoption of efficiency requirements for state facilities that surpass efficiency requirements in the statewide building code also earn 0.5 points. Leadership in Energy and Environmental Design (LEED) standards are only partially focused on energy savings and are not focused primarily on active energy management. The result is that some LEED buildings do not have energy performance that matches their design intentions (Turner and Frankel 2008). Thus, states with above-code LEED requirements for public buildings only received credit if energy efficiency points were specifically emphasized in the policy.

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 Portfolio Manager. Large-scale public-sector energy benchmarking programs could also qualify for the 0.5 points.

Scoring on activities related to energy savings performance contracting was based on three metrics: support, leadership, and resources. Descriptions of qualifying actions are described in table 33. A state was awarded 0.5 points if it satisfied at least two of the three criteria.

Table 33. Scoring criteria for ESPC policies and programs

Criterion	Qualifying action
Support	The state explicitly promotes the use 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 the procedures required to order for state agencies to utilize ESPCs

States must satisfy at least two of the three criteria above to receive credit.

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. For example, states could qualify for 0.5 points if fleet policies specified fuel economy improvements that exceeded existing corporate average fuel economy (CAFE) standards. Other policies that earned points 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. 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. Table 34 presents states' scores for lead-by-example initiatives.

Table 34. State scoring on lead-by-example initiatives

State	New and existing state building requirements	Benchmarking requirements for public building	Efficient fleets	ESPC policies and programs	Score (2 pts.)
Alabama	•	•	•	•	2
California	•	•	•	•	2
Connecticut	•	•	•	•	2
Delaware	•	•	•	•	2
Illinois	•	•	•	•	2
Minnesota	•	•	•	•	2
Montana	•	•	•	•	2
New Mexico	•	•	•	•	2
North Carolina	•	•	•	•	2
Texas	•	•	•	•	2
Utah	•	•	•	•	2
Washington	•	•	•	•	2
Arkansas	•	•		•	1.5
Georgia	•	•		•	1.5
Hawaii		•	•	•	1.5
Kansas	•	•		•	1.5

State	New and existing state building requirements	Benchmarking requirements for public building	Efficient fleets	ESPC policies and programs	Score (2 pts.)
Kentucky	•	•		•	1.5
Maine	•		•	•	1.5
Maryland	•	•		•	1.5
Massachusetts	•	•		•	1.5
Michigan	•	•		•	1.5
Mississippi		•	•	•	1.5
Missouri	•		•	•	1.5
Nevada	•	•		•	1.5
New York	•	•		•	1.5
Oregon	•	•		•	1.5
Puerto Rico	•	•		•	1.5
Rhode Island	•	•		•	1.5
South Carolina	•	•		•	1.5
Vermont	•	•	•		1.5
Wisconsin	•		•	•	1.5
Alaska	•	•			1
Arizona	•			•	1
Colorado		•		•	1
District of Columbia	•	•			1
Florida			•	•	1
Iowa	•	•			1
Louisiana	•			•	1
New Hampshire		•	•		1
New Jersey		•		•	1
Ohio		•		•	1
Oklahoma	•	•			1
Pennsylvania	•			•	1
Tennessee		•		•	1
Guam		•			0.5
Idaho				•	0.5
Indiana	•				0.5
Nebraska		•			0.5
South Dakota		•			0.5
U.S. Virgin Islands				•	0.5
Virginia				•	0.5
West Virginia		•			0.5
Wyoming				•	0.5
North Dakota					0

Lead-by-Example Initiatives: Leading and Trending States

Puerto Rico: Puerto Rico expanded its lead-by-example policies in 2014 through the passage of Act No. 57-2014. It requires all state agencies, public corporations, and judicial branch buildings to increase electricity savings by at least 40% over the next eight years. It also mandates government staff to benchmark energy use and monitor energy efficiency measures in all public buildings. Also, the Energy Savings Performance Contracts Act of 2012 established an ESPC program for state government buildings. Six state agencies are or will be participating in the ESPC program in 2014, potentially impacting more than 100 public buildings.

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 mpg 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 university 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 mpg by July 1, 2014.

Research and Development

We reviewed state energy efficiency R&D institutions based on information collected from a survey of state energy officials and other secondary research. This research complemented information we previously collected from the *National Guide to State Energy Research Centers* (ASERTTI 2013). In our scoring of this metric, 0.5 points were 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.[47] 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 report.

Table 35 presents the results. See Appendix J for expanded descriptions of state energy efficiency R&D program activities.

[47] 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.

Table 35. State scoring on R&D programs

State	Major R&D programs	Score (1.5 pts.)
California	California Energy Commission Electric Program Investment Charge (EPIC) program and Natural Gas Research, Development, and Demonstration program; University of California–Davis Center for Water-Energy Efficiency and Energy Efficiency Center; University of California–Berkeley Center for the Built Environment; 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 Engines and Energy Conversion Lab and Institute for the Built Environment; University of Colorado–Boulder Renewable and Sustainable Energy Institute; Colorado School of Mines Research in Delivery, Usage, and Control of Energy program; Center for Renewable Energy Economic Development; Colorado Energy Research Collaboratory	1.5
Connecticut	University of Connecticut Center for Clean Energy Engineering and Fraunhofer Center for Energy Innovation; Connecticut Center for Advanced Technology	1.5
Florida	University of Central Florida Florida Solar Energy Center; Florida State University Energy and Sustainability Center; University of Florida Florida Institute for Sustainable Energy and Florida Energy Systems Consortium; University of South Florida Clean Energy Research Center	1.5
Minnesota	Conservation Applied Research and Development Grant Program; University of Minnesota Center for Diesel Research; Center for Energy and Environment Innovation Exchange	1.5
Nebraska	University of Nebraska–Lincoln Nebraska Center for Energy Sciences Research; Energy Savings Potential program; Nebraska Utility Corporation	1.5
New York	New York State Energy Research and Development Authority; State University of New York Center for Sustainable and Renewable Energy; Syracuse University Building Energy and Environmental Systems Laboratory; City University of New York Institute for Urban Systems; Albany State University Energy and Environmental Technology Applications Center	1.5
North Carolina	North Carolina State University North Carolina Solar Center; North Carolina A&T State University Center for Energy Research and Technology; and Appalachian State University Energy Center	1.5
Oregon	Oregon State University Oregon Built Environment and Sustainable Technologies Center; University of Oregon Energy Studies in Buildings Laboratory and Baker Lighting Lab; Portland State University PGE Foundation Renewable Energy Research Lab; Energy Trust of Oregon; Oregon Transportation Research and Education Consortium	1.5
Pennsylvania	Leigh University Energy Research Center; Pennsylvania State University Indoor Environment Center and Consortium for Building Energy Innovation	1.5
Wisconsin	Energy Center of Wisconsin; Focus on Energy; University of Wisconsin–Madison Solar Energy Laboratory	1.5

State	Major R&D programs	Score (1.5 pts.)
Arizona	Northern Arizona University Institute for Sustainable Energy Solutions; Arizona State University LightWorks	1
Georgia	Southface Energy Institute; Georgia Institute of Technology Brook Byers Institute for Sustainable Systems	1
Illinois	University of Illinois at Chicago Energy Resources Center; University of Illinois Illinois Sustainable Technology Center	1
Iowa	Iowa Energy Center, research support through the Iowa Economic Development Authority	1
Kansas	Studio 804, Inc.; Wichita State University Center for Energy Studies	1
Maryland	University of Maryland Energy Research Center; Maryland Clean Energy Center	1
Massachusetts	Massachusetts Energy Efficiency Partnership; U. of Massachusetts Amherst Center for Energy Efficiency and Renewable Energy	1
Michigan	NextEnergy Center; Oakland University Clean Energy Research Center	1
Tennessee	University of Tennessee partnerships with Oak Ridge National Laboratory and the Electric Power Research Institute; CURENT	1
Texas	Texas A&M Engineering Experiment Station; University of Texas at Austin Center for Energy and Environmental Resources	1
Virginia	Riverstone Energy Center; R&D Center for Advanced Manufacturing and Energy Efficiency	1
Alabama	University of Alabama Center for Advanced Vehicle Technologies	0.5
Alaska	Cold Climate Housing Research Center	0.5
District of Columbia	Green Building Fund Grant Program	0.5
Hawaii	University of Hawaii Hawaii Natural Energy Institute	0.5
Idaho	Center for Advanced Energy Studies	0.5
Kentucky	University of Louisville Conn Center for Renewable Energy Research	0.5
Maine	Maine Technology Institute	0.5
Mississippi	Mississippi State University Energy Institute	0.5
Nevada	University of Nevada–Las Vegas Center for Energy Research	0.5
New Jersey	Edison Innovation Clean Energy Manufacturing Fund	0.5
Ohio	Ohio State University Center for Energy, Sustainability, and the Environment	0.5
Puerto Rico	Puerto Rico Energy Center	0.5
Rhode Island	University of Rhode Island Outreach Center Sustainable Energy Education Programs	0.5
Utah	Utah State University	0.5
Vermont	University of Vermont Smart Grid Research Center	0.5
Washington	Northwest Building Efficiency Technology Hub	0.5
West Virginia	West Virginia University Advanced Energy Initiative	0.5

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 Florida 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 Florida 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 2014 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 financial incentives by collecting data on state budgets for incentives and financing programs, participation rates, verified energy savings, and the leveraging of private capital in state financial incentives. We relied on our requests to state energy offices for this data collection. We sought to collect information on each potential metric in the hope that enough data would be available for a given metric that we could potentially include it in our analysis. While we received data on some of these potential metrics, the data returned to us were not robust enough to add any of these metrics to our analysis. For example, 13 states provided data on savings from incentives and financing programs, but savings data were generally program specific rather than portfolio wide, and in several cases savings were projected rather than verified savings.

We will continue to investigate the data collection issues surrounding these potential metrics and refine our financial incentives scoring methodology in the future based on data availability.

State Policies to Enable Local Energy Efficiency

Regions, counties, and municipalities have increasingly become active in energy efficiency program development. The energy efficiency policy and program efforts of the largest municipalities are captured in ACEEE's *City Energy Efficiency Scorecard* (Mackres et al. 2013). Local efforts to increase efficiency in communities can be supported, and many cases already have been, through effective collaboration between state and local governments. By working with local governments and stakeholders, state governments can make a particularly strong impact on land use and transportation, residential and commercial buildings, schools, and local government buildings and facilities through technical assistance, financial assistance, and legislative or regulatory mandates (Sciortino 2011). A sample of currently enacted policies that enable energy efficiency at the local level is included on the next page.[48]

Some metrics in the State Scorecard capture non-state efforts, but due to the significant impact state governments can have in enabling local actions, we will explore creating a metric that scores states based on the policies and programs they have enacted to assist local governments. The criteria may include any of the following:

- *Technical assistance.* Resources, including guidebooks, online resources, and state staff, dedicated to assisting local government with increasing efficiency in municipal buildings and schools
- *Financial assistance.* Incentives aimed at local governments to increase the efficiency of public facilities
- *Legislative or regulatory requirements.* Requirements promulgated by the state requiring municipal fleets or buildings to achieve specific energy reductions

[48] For more information on state government programs and policies aimed at local governments, see *How State Governments Enable Local Governments to Advance Energy Efficiency* (Sciortino 2011).

State Policies that Enable Local Energy Efficiency

Maryland. The Maryland Energy Administration runs the Maryland Smart Energy Communities program, which incentivizes local governments to adopt policies related to the energy efficiency of their buildings and fleets. By participating in this program, local governments set the goal of reducing their fleets' petroleum consumption by at least 20%. There are more than 50 participating local governments, including the largest cities and counties in the state.

Colorado. K–12 schools are subject to very high efficiency standards after the passage of SB 13-279 in 2013. The goal of this school efficiency bill is to create resource-efficient schools that use 33% less energy and 32% less water than their conventional counterparts. Any school receiving an operations budget from the state must meet the highest energy efficiency standards practicable. This may include ENERGY STAR or other high-efficiency performance certification. In addition to new facilities, redesign or renovation projects also must meet these high efficiency standards.

Connecticut. In January 2014, the Connecticut Department of Energy and Environmental Protection implemented a new lead-by-example initiative that extends the Small Business Energy Advantage program to state agencies and municipalities interested in installing energy efficiency measures in their buildings and allows them to pay for these investments on their utility bills, which removes a barrier for the government sector.

Minnesota. Initiated in late 2012, the state of Minnesota in partnership with the St. Paul Port Authority launched the Energy Savings Partnership (ESP) program to provide local units of government and school districts throughout the state with low-cost lease purchase agreement (LPA) financing. Using ESP, local units of government and school districts are able to access LPA financing to invest in energy efficiency projects by leveraging the energy and operational savings attained through the improvements to fund the LPA repayment, thereby allowing projects to be implemented on a budget-neutral basis via the state's Guaranteed Energy Savings Program (GESP) or the Public Buildings Enhanced Energy Efficiency Program (PBEEEP).

Puerto Rico. Municipalities in Puerto Rico must reduce 5% of their electrical energy consumption annually for three years, computed from the average of the highest three consumption years from 2004 to 2014, for a total reduction of 15%.

Nebraska. Nebraska public school districts are eligible for 1% loans of up to $750,000 and are required to benchmark all school buildings for the term of the loan.

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. Yet 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 of more efficient models to consumers. 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 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 Barack Obama signed a presidential memorandum that, over the next four years, required the introduction or updating 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 until the federal standards become effective; states that have not yet set standards are preempted immediately. States that wish to implement their own standards 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 AND RESULTS

A state could earn up to 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 (ASAP) 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 2 points in 0.5-point increments. Table 36 shows the scoring methodology and table 37, the results.

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

* 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 0.5 points since the savings would at least be greater than zero. California was already awarded the maximum number of points. *Sources:* Lowenberger et al. 2012; ASAP website as of September 2013.

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, but 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;[49] however the standards' levels have yet to be officially developed. As a result, no savings have been generated and we 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 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.

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, with 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 seven, 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, and many 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 21 categories of appliances, including both federally regulated and non-federally regulated appliances. Presently, California has adopted standards for10 products that are not covered by federal standards.

[49] 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 the more efficient use of energy in transportation, buildings, and industry. In doing so they are 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 Rhode Island, Vermont, and Oregon continuing to climb toward a top ranking and Washington D.C. making notable progress through its holistic approach to a sustainable energy future. Arkansas is also making significant strides from the lower tiers of states. The dynamism of these states is reflected in growing utility program budgets and savings, as well as in the range of other actions the states are taking to improve their energy efficiency through strong leadership and smart public policy.

At the same time, some states have faced pushback on energy efficiency policies. EERS policies in Ohio and Indiana were rolled back despite support from local communities and businesses. Utilities in Florida maintain that they have run out of cost-effective energy efficiency measures, though this is largely due to the state's reliance on the ratepayer impact measure (RIM) test and its lopsided use of all benefit-cost tests. Pushback on energy efficiency will likely continue across the country from anti-regulation groups and from industrial groups looking to opt out of energy efficiency programs.

A wide gap remains between states near the top and those at the bottom of the State Scorecard rankings. Market barriers and the regulation 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, cleanest energy resource—is critical to capturing the full range of its 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. Going forward, national policies will have an even greater effect on state-level energy planning. In June 2014, the EPA released a draft version of its Clean Power Plan, calling on states to reduce emissions under flexible frameworks (EPA 2014a). Energy efficiency programs are likely to offer the most cost-effective way of complying with the proposed rules.

States have already begun to plan for their energy future under these new rules. For example, The Louisiana Public Service Commission recently opened a docket on utility plans in response to the Clean Power Plan. With other energy efficiency rules also under consideration in Louisiana, there may be an important opportunity to expand energy efficiency in the state. Other states, including Illinois, Arkansas, and Ohio, are also actively planning for the new energy policies called for by the proposed rules.

Delaware is also poised to expand its energy efficiency programs. Legislation passed in July 2014 calls for the development of savings targets and requires utilities to develop and

implement energy efficiency programs to meet these targets. The law also allows for cost recovery and improved evaluation, measurement, and verification protocols. New York, meanwhile, is in the process of significantly altering its utility regulatory structures. Although its outcomes are as yet unclear, the state's Reforming the Energy Vision initiative will likely have a strong impact on New York's energy efficiency programs.

In addition, several states that only recently began implementing utility-sector energy efficiency programs (e.g., Michigan, Arkansas, and Arizona) will likely continue to ramp up program activity over the next few years to meet rising goals.[50] As noted in Chapter 2, combined utility spending on electricity and natural gas efficiency programs is estimated to rise to $15.6 billion by 2025 if many states give energy efficiency a prominent role as a resource (Barbose et al. 2013).

An increasing role for energy efficiency will not, however, occur in a vacuum. State support for energy efficiency and external factors beyond states' control will influence the impact and expansion of energy efficiency programs and policies in 2015 and beyond. Continued uncertainty around the economic recovery could dampen consumer demand for energy efficiency upgrades in the residential and commercial sectors, reducing savings from efficiency programs. Even more concerning is the impact on budgets for efficiency. Some policymakers have responded to a 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.[51] Some have also failed to fund energy efficiency budgets at levels high enough to meet mandated savings goals.

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 notably increasing their efforts, there are still many opportunities to sustain current efforts and to continue to scale up. Energy efficiency is a resource that is abundant in every state. Reaping its full economic, energy-security, and environmental benefits will require continued leadership from all stakeholders, including legislators, regulators, and the utility industry.

FURTHER RESEARCH

Addressing Data Needs

The scoring framework we used in this report is our best current 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 for future research that will help refine the State Scorecard scoring methodology and more accurately represent the changing landscape of energy efficiency in the states.

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[50] See Nowak et al. 2011 for a full discussion of how states are preparing to meet higher energy savings targets.

[51] 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 he will do the same in FY 2013 (which started July 1, 2012) with a reallocation of $210 million (NJ Spotlight 2012). New Jersey also withdrew from the Regional Greenhouse Gas Initiative, which had been providing the state with substantial funding for energy efficiency projects.

One of the most pronounced limitations is access to recent, reliable data on the results of energy efficiency work. Since many states do not gather data on the performance of energy efficiency policy efforts, we have used a best-practices approach to score some policy areas. As an example, it is difficult to score states on building energy code compliance rates because the majority of them do not collect the relevant data. The current Scorecard again expands our best-practices approach in this category, but performance metrics would allow for more objective and accurate assessment. While states should be applauded for adopting stringent building energy codes, the success of these codes in reducing energy consumption is unclear without a way to verify actual implementation.

We face a similar difficulty in scoring state-backed financing and incentive programs for energy efficiency investments. Though many states have seemingly robust programs aimed at residential and commercial consumers, few are able to relay information on program budgets or energy savings resulting from such initiatives. As a result, we can offer only a qualitative analysis of these programs.

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 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 underrepresented in the datasets we used in this report. We were able to address this deficiency to some extent, but future editions of the Scorecard would benefit from higher levels of reporting from utilities and administrators to the EIA, CEE, state utility commissions, and national groups such as the National Rural Electric Cooperative Association and the American Public Power Association.[52]

We would also like to see spending and savings data for energy efficiency programs targeting home heating fuel and propane. We continue to expand our research on natural gas efficiency programs, and, if data were available, we could also examine metrics for fuel oil and propane efficiency.

Additional or Revised Metrics for Potential Inclusion

We have described relevant potential future metrics in several chapters of this year's State Scorecard. While we believe our data collection and scoring methodology are comprehensive, there is always room for modifications. As the energy efficiency market continues to evolve and data become more available, we will continue to adjust each chapter's scoring metrics. Here we present some additional metrics that currently fall outside the scope of our report but that nonetheless indicate important efficiency pathways.

State efficiency programs that fall outside the realm of utility-sector and public benefits programs are one area we hope assess more comprehensively and quantitatively in future versions of the Scorecard. Since the passage of ARRA in 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

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

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 through on-bill financing and other innovative incentive programs. As discussed in Chapter 6, one possible metric to compare state financial incentives is the level and sustainability of budgets for these programs. This information is available in some cases, but gathering it for all programs will continue to present challenges. We may also be able to compare state energy efficiency R&D efforts on the basis of budgets and staffing levels, but data availability is again an issue.

Internet-connected devices, smart meters, and other intelligent efficiency technologies are proliferating in many states. These devices help overcome informational and motivational barriers to consumer uptake of energy efficiency, especially in the residential sector. A new industry is emerging that uses social marketing and social media to encourage consumers to save energy, for example by giving them frequent feedback on their energy use and tailored energy savings tips. Data-focused policies can enable the growth of this promising area of energy efficiency, including state data privacy policies, disclosure policies for building energy use, and data-access policies such as the industry-led Green Button standard. We will consider including some of these enabling policies in future versions of the Scorecard.

We also hope to dive further into the ways that state policies can enable local governments to invest in energy efficiency policies and programs. This year we captured some anecdotal evidence of state policies affecting local energy efficiency outcomes, and we will analyze such outcomes in our 2015 City Energy Efficiency Scorecard. The interaction between these two levels of government is increasingly dynamic, and we will continue to explore a State Scorecard metric that compares states on the policies and programs they have enacted to assist local governments.

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Appendix A. Electric Efficiency Program Budgets Per Capita

State	2013 budget ($million)	$ per capita
Massachusetts	507.7	75.86
Rhode Island	77.5	73.70
Vermont	42.8	68.30
New Jersey	395.1	44.40
Oregon	171.3	43.58
Washington	293.7	42.13
Maryland	205.9	34.73
Iowa	106.7	34.53
California	1,188.8	31.01
New York	593.9	30.22
Minnesota	155.5	28.69
Connecticut	102.4	28.48
Maine	34.2	25.75
Idaho	38.8	24.05
Hawaii	33.5	23.85
Arkansas	65.9	22.27
Illinois	283.8	22.03
Arizona	143.2	21.61
District of Columbia	14.0	21.59
New Hampshire	27.4	20.70
Pennsylvania	237.6	18.60
Ohio	212.8	18.39
Montana	18.4	18.12
Nevada	50.5	18.10
Colorado	89.4	16.97
Michigan	165.5	16.72
Wisconsin	79.9	13.92
Florida	258.1	13.20
Utah	35.3	12.16
Indiana	76.8	11.69
New Mexico	23.1	11.08
Wyoming	6.4	10.96
Oklahoma	38.7	10.05
Kentucky	44.0	10.00
Tennessee	55.7	8.57
Missouri	48.2	7.98
North Carolina	74.9	7.61
Nebraska	13.8	7.36
Texas	181.4	6.86
South Dakota	5.1	6.04
West Virginia	9.0	4.87
South Carolina	22.1	4.62
Georgia	40.1	4.01
Delaware	2.4	2.59
Mississippi	7.5	2.50
Alabama	10.8	2.23
Louisiana	3.7	0.79
Kansas	0.7	0.26
Virginia	0.8	0.10
Alaska	0.0	0.00
Guam	0.0	0.00
North Dakota	0.0	0.00
Puerto Rico	0.0	0.00
Virgin Islands	0.0	0.00
U.S. total	$6,294.6	
Median	$43.38	$13.56

Appendix B. 2012 and 2013 Savings Data Disaggregated

State	2012 electric program savings (MWh)	Savings as % of retail sales	2012 natural gas program savings (MMTherms)	Savings as % of retail sales*	2013 electric program savings (MWh)	Savings as % of retail sales	2013 natural gas program savings (MMTherms)	Savings as % of retail sales*
Alabama	5,6045	0.06%	—	—	—	—	—	—
Alaska	1,517	0.02%	—	—	—	—	—	—
Arizona	1,244,555	1.66%	3.30	0.49%	1,317,329	1.74%	—	—
Arkansas	142,187	0.30%	3.34	0.48%	227,531	0.49%	5.19	0.75%
California	2,130,000	0.82%	24.50	0.33%	1,701,601	0.66%	31.00	0.41%
Colorado	419,237	0.78%	4.80	0.28%	472,000	0.88%	6.10	0.36%
Connecticut	322,102	1.09%	3.70	0.43%	285,817	0.97%	4.80	0.56%
Delaware	8,450	0.07%	0.17	0.09%	8,809	0.08%	0.10	0.05%
District of Columbia	24,054	0.21%	0.05	0.02%	52,303	0.47%	0.50	0.18%
Florida	587,083	0.27%	—	—	—	—	—	—
Georgia	241,261	0.18%	—	—	288,140	0.22%	—	—
Guam	—	—	—	—	—	—	—	—
Hawaii	120,070	1.25%	—	—	159,056	1.67%	—	—
Idaho	188,245	0.80%	—	—	—	—	—	—
Illinois	1,455,652	1.02%	18.30	0.33%	1,318,916	0.99%	29.30	0.52%
Indiana	615,018	0.59%	—	—	—	—	6.30	0.34%
Iowa	481,271	1.05%	9.09	0.89%	491,543	1.06%	7.92	0.78%
Kansas	8,907	0.02%	—	—	—	—	—	—
Kentucky	401,864	0.45%	2.03	0.27%	437,276	0.52%	2.96	0.39%
Louisiana	20,572.422	0.02%	—	—	—	—	—	—
Maine	136,985	1.19%	0.02	0.02%	92,313	0.78%	0.14	0.15%
Maryland	539,640	0.87%	1.30	0.09%	641,322	0.97%	1.00	0.07%
Massachusetts	980,113	1.80%	22.63	1.17%	1,116,442	2.05%	24.67	1.28%
Michigan	1,198,644	1.15%	43.80	1.02%	1,284,863	1.51%	44.00	1.02%
Minnesota	662,687.1	0.98%	25.83	1.31%	699,998	1.04%	26.82	1.36%
Mississippi	36,810	0.08%	—	—	—	—	—	—
Missouri	100,644	0.12%	—	—	406,897	0.49%	—	—
Montana	91,474	0.66%	—	—	—	—	—	—
Nebraska	86,527	0.29%	—	—	53,850	0.20%	—	—
Nevada	188,757	0.54%	—	—	171,369	0.81%	0.96	0.14%
New Hampshire	57,938	0.53%	1.95	1.31%	58,774	0.56%	1.39	0.93%
New Jersey	414,794	0.55%	—	—	418,693	0.56%	8.82	0.24%
New Mexico	126,195	0.54%	0.62	0.11%	126,069	0.54%	0.68	0.12%
New York	1,338,060	0.94%	18.83	0.29%	1,617,667	1.13%	25.70	0.40%
North Carolina	533,404	0.42%	—	—	718,739	0.55%	—	—

State	2012 electric program savings (MWh)	Savings as % of retail sales	2012 natural gas program savings (MMTherms)	Savings as % of retail sales*	2013 electric program savings (MWh)	Savings as % of retail sales	2013 natural gas program savings (MMTherms)	Savings as % of retail sales*
North Dakota	10,330	0.07%	—	—	—	—	—	—
Ohio	1,323,498	0.87%	—	—	—	—	—	—
Oklahoma	99,198	0.17%	1.50	0.17%	156,847	0.27%	2.90	0.33%
Oregon	510,993	1.10%	5.59	0.77%	676,046	1.43%	5.30	0.73%
Pennsylvania	1,533,976	1.06%	—	—	1,410,305	0.97%	—	—
Puerto Rico	—	—	—	—	—	—	—	—
Rhode Island	119,666	1.55%	2.30	0.86%	161,831	2.09%	3.30	1.24%
South Carolina	273,758	0.35%	0.07	0.02%	298,215	0.38%	0.08	0.02%
South Dakota	29,475	0.25%	0.20	0.10%	21,435	0.18%	0.43	0.21%
Tennessee	302,493	0.31%	0.00	0.00%	273,267	0.28%	0.00	0.00%
Texas	686,554	0.19%	0.00	0.00%	693,968	0.19%	0.00	0.00%
Utah	219,612	0.74%	4.10	0.42%	264,375	0.87%	6.37	0.65%
Vermont	117,649	2.14%	0.75	1.37%	99,074	1.78%	0.80	1.47%
Virgin Islands	—	—	—	—	—	—	—	—
Virginia	29,923	0.03%	—	—	—	—	—	—
Washington	856,137	0.92%	5.94	0.44%	990,143	1.35%	7.02	0.51%
West Virginia	54,105	0.18%	0.59	0.13%	69,241	0.22%	0.70	0.15%
Wisconsin	460,784	0.67%	16.50	0.85%	619,418	0.90%	17.50	0.90%
Wyoming	23,605	0.14%	—	—	—	—	—	—

Savings are net savings. We applied a 0.9 net-to-gross ratio where only gross savings were available. *Natural gas sales are 2012 commercial and retail sales only from EIA (2014b).

Appendix C. Summary of Large Customer Self-Direct Programs by State

State	Availability	Description
Arizona	Offered by Arizona Public Service Company (APS), Tucson Electric Power Company, and Salt River Project	APS: Large customers using at least 40 million kWh per calendar year can elect to self-direct energy efficiency funds. Customers must notify APS each year if they wish to participate, after which 85% of the customer's demand-side management contribution will be reserved for future energy efficiency projects. Projects must be completed within two years. Self-direction funds are paid once per year once the project is completed and verified by APS.
Colorado	Offered by Black Hills and Xcel Energy	Xcel: The self-direct program is available to commercial and industrial (C&I) electric customers who have an aggregated peak load of at least 2 MW in any single month and an aggregated annual energy consumption of at least 10 GWh and are not allowed to participate in other conservation products offered by the company. Rebates are paid based on actual savings from a project, up to $525 per customer kW or $0.10 per kWh; rebates are given for either peak demand or energy savings but not both and are limited to 50% of the incremental cost of the project. Xcel uses raw monitoring results and engineering calculations to demonstrate actual energy and demand savings based on monitoring results. Black Hills: To participate in the C&I self-direct program, customers must have an aggregated peak load greater than 1 MW in any single month and aggregated annual energy usage of 5,000 MWh. Rebates and savings are calculated on a case-by-case basis; rebate values are calculated as either 50% of the incremental cost of the project or $0.30 per kWh savings, whichever is lower.
Connecticut	Statewide pilot through C&LM's Business and Energy Sustainability Program	The program is available to any C&I customer within the companies' service territories with peak demand over 500kW and willing to sign and commit to following a memorandum of understanding (MoU). The intent of the MoU is to be highly customized and customer specific. Self-directed solutions offer electric and natural gas incentives and analytical services for C&I customers to improve their facilities in order to make them more energy efficient. In 2014, the companies will consider piloting and testing promising concepts, technologies, and services for eventual inclusion in the programs. The utilities can provide evaluations and recommendations upon request, with the customer being responsible for implementing the improvements. Typically, MoUs include participation by upper management; the establishment of specific, aggressive savings targets; and measurement and verification (M&V) strategies to document the savings throughout the target facilities. Enrollment was slated to begin in summer 2014.
Idaho	Customers of Idaho Power	Idaho Power offers its largest customers an option to self-direct the 4% energy efficiency rider that appears on all customers' bills. Customers have three years to complete projects and have 100% of funds available to fund up to 100% of project costs. Self-direct projects are subject to the same criteria as projects in other efficiency programs. Two large customers within the state were granted permission to opt out of programs, representing 0.04% of load.

State	Availability	Description
Illinois	Statewide for natural gas customers based on NAICS code; pilot program for electric customers	The self-direct provisions, in Section 8-104(m) of the Illinois Public Utilities Act, are applicable for gas customers that have a North American Industry Classification System (NAICS) code number of 22111 or any number beginning with the digits 31, 32, or 33 and (i) annual usage in the aggregate of 4 million therms or more within the service territory of the affected gas utility or with aggregate usage of 8 million therms or more in the state and that are complying with the provisions of item (I) of this subsection (m); or (ii) using natural gas as feedstock and meeting the usage requirements described in item (i) of this subsection (m), to the extent that such annual feedstock usage is greater than 60% of the customer's total annual usage of natural gas. Participants' energy-efficient funds are set aside for their own use, and participants are subject to the oversight of the Illinois Department of Commerce and Economic Opportunity. Currently, self-directing customers make up about 18% of total regulated retail gas sales. There is an additional program being piloted by electric utilities under their Section 8-103 programs that would create similar opportunities for large electric customers. This program is not yet in effect and details are still being developed, but its structured EM&V protocols are likely to result in more certain energy savings.
Massachusetts	Statewide	A self-direct option is available to the five largest customers in every service territory. Participant activities must meet statewide cost-effective criteria and are subject to EM&V standard practices. Mass Save® program administrators are responsible for program evaluation.
Michigan	Statewide	Self-direct is available to customers based on both aggregate peak demand and peak demand at individual sites. From 2011–13, the customer must have had an annual peak demand in the preceding year of at least 1 MW at each site or 5 MW in the aggregate at all sites. In 2014 or any year thereafter, the customer must have had an annual peak demand in the preceding year of at least 1 MW in the aggregate at all sites to be covered by the self-directed plan. The customer may recover costs for implementation, review, and evaluation. A mechanism must be established to cover the costs of the low-income energy optimization program. Self-directed plans must be multiyear, must meet or exceed energy optimization performance standards based on annual usage, and are to be incorporated into the relevant provider's energy optimization plans. Once implemented, that customer is exempt from energy optimization charges and is not eligible to participate in the relevant provider's energy optimization programs. These programs are self-certified, but subject to Michigan Public Service Commission review. The customer is responsible for self-evaluation, which is approved in the program plan. The information is reported to the utility provider and also subject to commission review. The number of customers electing to self-direct their energy efficiency programs has dropped from 77 customers in 2009 to 32 in 2012.This reflects the flexibility and comprehensive program options being offered by the utility provider programs.

State	Availability	Description
Minnesota	Statewide	Minnesota offers a self-direct option, with a full exemption from assigned cost-recovery mechanism (CRM) fees, to customers with 20 MW average electric demand or 500,000 MCF of gas consumption. Customers must also show that they are making "reasonable" efforts to identify or implement energy efficiency and that they are subject to competitive pressures that make it helpful for them to be exempted from the CRM fees. Participating customers must submit new reports every five years to maintain exempt status. The utility is not involved in self-direct program administration; the state Department of Commerce functions as the manager of self-direct accounts and is the arbiter of whether a company qualifies for self-direct and is satisfying its obligations.
Montana	Offered by NorthWestern Energy	NorthWestern Energy allows customers with demand larger than 1 MW to channel their CRM funds to an escrow account that repays them on a quarterly basis for completed self-direct projects. The annual maximum contribution is $500,000, and companies have two years to use their funds before they are returned to the larger pool of CRM revenues. NorthWestern administers the funds but provides no measurement or verification. Self-direct customers file annual reports with the Montana Department of Revenue. The department publishes these reports and a public "challenge" process is provided for as the only scrutiny or review.
New Jersey	Statewide	Eligible customers must have made a minimum contribution of $300,000 toward New Jersey's Clean Energy Program (NJCEP). Participants are eligible for an incentive of up to 90% of the amount paid into the NJCEP. Applicants are required to include a plan for measurement and verification of energy savings. To date, about 12 customers have participated in the program.
New Mexico	Statewide in the territories of three IOUs	Eligible customers must have electricity consumption of greater than 7,000 MWh per year. Participants can receive credit for up to 70% of the annual energy efficiency rider. Monitoring and verification are done independently.
Ohio	Statewide	Self-direct options are available for large customers in Ohio. Under SB 221, a mercantile customer, which is a commercial or industrial customer that consumes more than 700,000 kWh per year, may enter into a special arrangement with an electric utility to integrate the customer's demand-reduction, demand-response, or energy efficiency programs with those of the electric utility. If the specified reduction levels are met, the customer can request exemption from the CRM. One of the state's utilities, American Electric Power (AEP), has a self-direct program that offers customers an incentive for previously implemented energy efficiency measures. The one-time incentive is 75% of what the measure would cost under AEP programs and has a maximum limit of $225,000.Projects must have been implemented after January 1, 2008, and must produce 100% of the stated energy savings and/or peak demand reductions over a five-year period. Customers taking the incentive are still eligible to participate in the utility's other energy efficiency programs because they are still paying the CRM fee.

State	Availability	Description
Oregon	Customers of Portland General Electric, PacifiCorp, and Emerald People's Utility District (PUD)	In the Portland General Electric and PacifiCorp service territory, customers must have consumption of greater than 1 average MW (aMW) or 8,760 MWh. At Emerald PUD the program is open to the two customers in their large customer class. In Portland General Electric, PacifiCorp, and Emerald PUD service areas, participants receive credits equal to the cost of completed and approved energy efficiency projects, which are applied against the public purpose charge on the electric utility bills. Emerald PUD customers can also use the credit to request reimbursement for "banked" public purpose charges. The Oregon Department of Energy (ODOE) reviews and approves each project based on engineering analyses. ODOE also reviews actual expenditures and verifies installation on a sample of projects. Complex projects may require data collection for subsequent review by ODOE. There are currently 22 sites self-directing their energy efficiency funds.
Utah	Customers of Rocky Mountain Power	Rocky Mountain Power's self-direct program is a project-based rate credit program that offers up to an 80% credit of eligible project costs back to customers as a rate credit against the 3.7% CRM charge all customers pay. Customers earn a credit of up to 100% of their CRM charge, but do pay a flat $500 per project administrative fee for each self-directed project. Customers can choose to engage in self-direct and more traditional CRM programs simultaneously, provided the different programs are used to deploy different projects.
Vermont	Statewide for both electric and natural gas customers	Electric: Vermont's Self-Managed Energy Efficiency Program (SMEEP) allows an eligible customer to be exempt from the [electric] energy efficiency charge (EEC) provided that the customer commits to spending an annual average of no less than $1 million per year over a three-year period on energy efficiency investments. SMEEP is open to transmission-class or industrial-class customers that paid an EEC of at least $1.5 million in calendar year 2008. Additionally, an eligible customer must demonstrate that it has a comprehensive energy management program with annual objectives, or demonstrate that it has achieved certification of ISO standard 14001. In addition, the Vermont Public Service Board has established an option for eligible Vermont business customers to self-administer energy efficiency through the use of an energy savings account (ESA) or the customer credit program. The ESA option allows Vermont businesses that pay an EEC in excess of $5,000 total per year (or an average $5,000 total per year over three years) to use a portion of their EEC to support energy efficiency projects in their facilities. Natural gas: The SMEEP program has been extended to cover natural gas. Eligible only for transmission and industrial electric and natural gas ratepayers, customer efficiency charges for electric usage must be a minimum of $1.5 million. To receive the exemption from the natural gas efficiency bill charges, the customer must make an additional energy efficiency investment of not less than $55,000. For both electric and natural gas self-directing customers, the Department of Public Service and the Public Service Board provide the oversight and evaluation for SMEEP and ESA participants, as part of their overall EM&V of utility efficiency programs. There is one eligible SMEEP customer, and it participates in both electric and natural gas programs. There are two participants in the ESA program (out of more than 100 eligible firms), and one participant (which is likely the only eligible firm) in the similar Customer Credit Program.

State	Availability	Description
Washington	All utilities have the option to develop self-direct options for industrial and commercial customers, but of the IOUs, only Puget Sound Energy has developed a self-direct program	Puget Sound Energy's self-direct program is available only to industrial or commercial customers on electric rate–specific rate schedules. The self-direct program operates on a four-year cycle comprised of two phases, noncompetitive and competitive. During the noncompetitive phase, customers have exclusive access to their energy efficiency funds, which are the funds collected over the four-year period. When this phase closes, any unused funds are pooled together and competitively bid on by the members of the self-directed program. Customers receive payment in the form of a check once the project is complete and verified. Participating customers do not receive any rate relief when they complete energy efficiency investments. One hundred percent of projects are pre- and post-verified by the utility. This includes review and revision of savings calculations by the utility to determine incentive levels. The program is included in the third-party evaluation cycle like all other utility conservation programs.
Wisconsin	Statewide	A self-direct option is open to a customer if it meets the definition of a large energy customer according to 2005 Wisconsin Act 141. Under the self-direct option, there is a "true-up" at the end of the year and the customer receives their contributions back to be used on energy efficiency projects. Evaluation is required under Public Service Commission (PSC) Administrative Code 137.PSC would review the evaluation plan. This option has been available since 2008, but no customers have participated to date.
Wyoming	Customers of Rocky Mountain Power	Rocky Mountain Power offers a self-direct option for customers. The self-direct program is a project-based rate credit program that offers up to an 80% credit of eligible project costs back to customers as a rate credit against the 3.7% CRM charge all customers pay. Customers earn a credit of up to 100% of their CRM charge, but do pay a flat $500administrative fee for each self-directed project. Customers can choose to engage in self-direct and more traditional CRM programs simultaneously, provided the different programs are used to deploy different projects.

Appendix D. Details of States' Energy Efficiency Resource Standards

State (year enacted) Policy type Sector(s) covered Applicability (% of sales affected)	Description	Approximate annual electric savings target (2013+)	Stringency	Reference	Score
Arizona (2010) EERS Electric and natural gas IOUs, co-ops (~59%)	Electric: Annual savings targets began at 1.25% of sales in 2011, ramping up to 2.5% in 2016–20 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, Decision 71855	3
Arkansas (2010) EERS Electric and natural gas IOUs (~53%)	Electric: Annual reduction of 0.75% of total kWh sales in 2014 and 0.9% in 2016. Natural gas: Annual reduction of 0.40% in 2014 and 0.5% in 2015. The Public Service Commission has withheld a ruling on targets for 2016–17 pending a potential study.	0.8%	Opt out	Order No. 17, Docket No. 08-144-U Order No. 15, Docket No. 08-137-U Order No. 1, Docket No. 13-002-U	1.5
California (2004 and 2009) EERS Electric and natural gas IOUs (~78%)	Electric: ~0.9% annual savings through 2020. Demand reduction of 4,541 MW through 2020. Natural gas: 619 gross MMTh 2012–20. 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
Colorado (2007) Tailored targets Electric and natural 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 COPUC Docket No. 12A-100E Dec. R12-0900 Docket 10A-554EG	3

State (year enacted) Policy type Sector(s) covered Applicability (% of sales affected)	Description	Approximate annual electric savings target (2013+)	Stringency	Reference	Score
Connecticut (2011 and2013) EERS Electric and natural gas	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. Utilities must pursue all cost-effective efficiency resources.	1.4%	Binding	Public Act 13-298 Public Act 11-80 Docket 12-11-04	2.5
Hawaii (2004 and 2009) RPS-EERS Electric Statewide goal (100%)	In 2009, transitioned away from a combined RPS-EERS to a standalone EERS 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 Hawaii Public Utility Commission Order, Docket 2010-0037	2
Illinois (2007) EERS Electric and natural gas utilities with over 100,000 customers, Illinois Department of Commerce and Economic Opportunity (~89%)	Electric: Legislative targets call for 0.2% annual savings in 2008, ramping up to 1% in 2012, 2% in 2015 and thereafter. However, recent utility targets approved by the Illinois Commerce Commission are significantly lower due to cost cap limitations. Natural gas: 8.5% cumulative savings by 2020 (0.2% annual savings in 2011, ramping up to 1.5% in 2019).	0.9%	Cost cap	S.B. 1918 Public Act 96-0033 § 220 ILCS 5/8-103	1
Iowa (2009) Tailored targets Electric and natural gas Statewide goal (100%)	Electric: Varies by utility from 1% to 1.5% annually. Natural gas: Varies by utility from 0.74% to 1.2% annually.	1.3%	Binding	Senate Bill 2386 Iowa Code § 476	2.5
Maine (2009) EERS Electric and natural gas Efficiency Maine (100%)	Electric and natural gas savings of 20% by 2020, with annual savings targets of ~1.6% for electric and ~0.3% for natural gas. Efficiency Maine operates under an all cost-effective mandate.	1.6%	Opt out	Efficiency Maine Triennial Plan H.P. 1128 – L.D. 1559	3

State (year enacted) Policy type Sector(s) covered Applicability (% of sales affected)	Description	Approximate annual electric savings target (2013+)	Stringency	Reference	Score
Maryland (2008) EERS Electric Statewide goal (100%)	15% per capita 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 is currently under discussion.	1.6%	Binding	Md. Public Utility Companies Code § 7-211	3
Massachusetts (2009) EERS Electric and natural gas IOUs, co-ops, munis, 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 09-116–09-128 D.P.U. Order 12-100–12-111	3
Michigan (2008) EERS Electric and natural 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
Minnesota (2007) EERS Electric and natural gas Statewide goal (100%)	The nominal standard is 1.5% for both electric and natural gas utilities, adjustable to a minimum of 1% for IOUs. Interim targets of 0.75% were approved for gas utilities over 2010–12.Gas utilities were approved at the 1% level for the 2013–15 plans.	1.5%	Binding	Minn. Stat. § 216B.241	3
Nevada (2005, 2009, and 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 2025.	0.4%	Binding	NRS 704.7801 et seq.	0
New Mexico (2008 and 2013) EERS Electric IOUs (68%)	5% reduction from 2005 total retail electricity sales by 2014, and 8% reduction by 2020.	1.0%	Binding	N.M. Stat. § 62-17-1 et seq.	2

State (year enacted) Policy type Sector(s) covered Applicability (% of sales affected)	Description	Approximate annual electric savings target (2013+)	Stringency	Reference	Score
New York (2008) EERS Electric and natural gas Statewide goal (100%)	Electric: Annual savings of ~1% per year through 2015. Natural gas: Annual savings of ~0.5% per year through 2015. EEPS targets apply to utilities and NYSERDA.	1.0%	Binding	NY PSC Order, Case 07-M-0548 NY PSC Order, Case 07-M-0748	2.5
North Carolina (2007) RPS-EERS Electric Statewide goal (100%)	Renewable Energy and Energy Efficiency Portfolio Standard 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.	0.4%	Opt out	N.C. Gen. Stat. § 62-133.8 04 NCAC 11 R08-64, et seq.	0
Oregon (2010) Tailored targets Electric and natural gas Energy Trust of Oregon (100%)	Electric: Targets are equivalent to 0.8% of 2009 electric sales in 2010, ramping up to 1.4% in 2013 and 2014. Natural gas: 0.2% of sales in 2010 ramping up to 0.4% in 2014.	1.4%	Binding	Energy Trust of Oregon 2009 Strategic Plan	2.5
Pennsylvania (2004 and 2008) EERS Electric Utilities with over 100,000 customers (~93%)	3% cumulative savings from 2009–13; ~2.3% cumulative savings from 2014–16. 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
Rhode Island (2006) EERS Electric and natural gas IOUs, munis (~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

State (year enacted) Policy type Sector(s) covered Applicability (% of sales affected)	Description	Approximate annual electric savings target (2013+)	Stringency	Reference	Score
Texas (1999 and 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
Vermont (2000) Tailored targets Electric Efficiency Vermont (100%)	Expected cumulative savings of ~6.6% from 2012–14. EERS includes demand response targets. Efficiency Vermont must set budgets at a level that would realize all cost-effective energy efficiency. Budgets for the next program cycle have been approved, but quality performance indicators including MWh targets have not yet been set.	2.0%	Binding	30 V.S.A. § 209 VT PSB Docket EEU-2010-06	3
Washington (2006) EERS Electric IOUs, co-ops, munis (~81%)	Biennial and 10-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
Wisconsin (2011) Tailored targets Electric and natural gas Focus on Energy (100%)	Electric: 0.66% of annual sales in 2011–2014 and 0.77% of annual sales in 2015–18. Natural gas: 0.5% of sales in 2011–2014 and 0.6% in 2015–18. Energy efficiency measures may not exceed an established cost cap.	0.7%	Cost cap	Order, Docket 5-GF-191	1

Appendix E. State Transit Funding

State	FY 2012 funding ($million)	2012 population	Per capita transit expenditure ($/person)
Alaska	180.0	730,307	$246.44
New York	4,465.9	19,576,125	$228.13
Massachusetts	1,245.4	6,645,303	$187.41
Maryland	1,086.5	5,884,868	$184.63
Connecticut	453.5	3,591,765	$126.25
New Jersey	918.0	8,867,749	$103.52
District of Columbia	484.2	5,000,000	$96.83
Delaware	82.7	917,053	$90.21
Pennsylvania	1,091.9	12,764,475	$85.54
Illinois	814.4	12,868,192	$63.29
Minnesota	309.4	5,379,646	$57.52
Rhode Island	53.1	1,050,304	$50.53
California	1,849.2	37,999,878	$48.66
Virginia	239.2	8,186,628	$29.22
Michigan	240.4	9,882,519	$24.33
Wisconsin	117.9	5,724,554	$20.59
Florida	217.3	19,320,749	$11.25
Vermont	6.8	625,953	$10.93
Indiana	56.0	6,537,782	$8.57
Oregon	32.7	3,899,801	$8.38
Washington	52.8	6,895,318	$7.65
North Carolina	73.6	9,748,364	$7.55
Tennessee	44.5	6,454,914	$6.89
North Dakota	3.2	701,345	$4.49
Wyoming	2.5	576,626	$4.37
Iowa	12.9	3,075,039	$4.19
New Mexico	6.7	2,083,540	$3.20
Colorado	12.4	5,189,458	$2.38
Kansas	6.0	2,885,398	$2.08
Nebraska	2.9	1,855,350	$1.56

State	FY 2012 funding ($million)	2012 population	Per capita transit expenditure ($/person)
Oklahoma	5.8	3,815,780	$1.51
West Virginia	2.8	1,856,680	$1.50
South Carolina	6.0	4,723,417	$1.27
Arkansas	3.5	2,949,828	$1.18
Texas	30.3	26,060,796	$1.16
Louisiana	5.0	4,602,134	$1.08
South Dakota	0.8	834,047	$0.92
Ohio	7.3	11,553,031	$0.63
Mississippi	1.6	2,986,450	$0.54
Missouri	3.0	6,024,522	$0.50
Maine	0.5	1,328,501	$0.40
Kentucky	1.5	4,379,730	$0.34
Montana	0.3	1,005,494	$0.32
Georgia	2.9	9,915,646	$0.29
Idaho	0.3	1,595,590	$0.20
New Hampshire	0.2	1,321,617	$0.18
Nevada	0.1	2,754,354	$0.04
Alabama	0.0	4,817,528	$0.00
Arizona	0.0	6,551,149	$0.00
Hawaii	0.0	1,390,090	$0.00
Utah	0.0	2,854,871	$0.00

Source: AASHTO 2014.

Appendix F. State Transit Legislation

State	Description of transit legislation	Source
Arkansas	Passed in 2001, Arkansas Act 949 established the Arkansas Public Transit Fund, which directs monies from rental vehicle taxes toward public transit expenditures.	ftp://www.arkleg.state.ar.us/acts/2001/htm/ACT949.pdf
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.	https://gsfic.georgia.gov/transportation-investment-act
Hawaii	Section HRS 46-16.8 of the Hawaii Revised Statutes allows municipalities to add a county surcharge on state tax that is then funneled toward mass transit projects.	http://www.capitol.hawaii.gov/hrscurrent/Vol02_Ch0046-0115/HRS0046/HRS_0046-0016_0008.htm
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
Indiana	House Bill 1011 specifies that a county or city council may elect to provide revenue to a public transportation corporation from the distributive share of county adjusted gross income taxes, county option income taxes, or county economic development income taxes. An additional county economic development income tax no higher than 0.3% may also be imposed to pay the county's contribution to the funding of the metropolitan transit district. Only six counties within the state may take advantage of this legislation.	http://legiscan.com/IN/text/HB1011/id/673339

State	Description of transit legislation	Source
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
Maine	The Maine Legislature created a dedicated revenue stream for multimodal transportation in 2012. Through sales tax revenues derived from taxes on vehicle rentals, Maine's Multimodal Transportation Fund must be used for the purposes of purchasing, operating, maintaining, improving, repairing, constructing, and managing the assets of non-road forms of transportation.	http://www.mainelegislature.org/legis/statutes/23/title23sec4210-B.html
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 toward public transportation and targeted transit demand management programs.	http://www.legislature.mi.gov/(S(hlkm5k45i240utf2mb0odtzt))/mileg.aspx?page=getObject&objectName=mcl-247-660b
Minnesota	House File 2700, adopted in 2010, is an omnibus bonding and capital improvement bill that 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 increased 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 called for the establishment of a congestion relief and intermodal transportation fund.	http://www.ncleg.net/sessions/2009/bills/house/pdf/h148v2.pdf
Oregon	Oregon has a Lieu of State Payroll Tax Program that provides a direct ongoing revenue stream for transit districts that can demonstrate equal local matching revenues from state agency employers in their service areas.	https://www.oregonlegislature.gov/citizen_engagement/Reports/2008PublicTransit.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

State	Description of transit legislation	Source
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 in 2013, created 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, the West Virginia Legislature passed Senate Bill No. 103. This bill is known as the West Virginia 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 G. Summary of States' Building Code Stringency

State	Building code stringency	Score
Alabama	Effective October 1, 2012, the Alabama Energy and Residential Code (AERC) became mandatory statewide, for the first time in the state's history. The residential provisions of the AERC reference Chapter 11 of the 2009 International Residential Code® (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 and several have done so, having adopted the 2012 IECC and/or the 2012 IRC.	3
Alaska	Effective July 2013, Alaska's residential code is the state-developed Building Energy Efficiency Standard (BEES), which is based on the 2012 IECC and ASHRAE Standard 62.2-20112 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 the 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. Out of the 100 jurisdictions that have adopted codes, 54 have adopted the 2009 IECC or better, with an additional 10 having adopted the 2006 IECC, which, in total, covers just over 90% of Arizona's population.	2.5
Arkansas	The Arkansas Energy Code for New Building Construction is mandatory statewide for both residential and commercial buildings, though municipalities are allowed to adopt codes more stringent than the statewide mandatory code. 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 first adopted Building Energy Efficiency Standards in 1978 and has regularly updated them approximately every three years since. The most recently adopted 2013 Building Energy Efficiency Standards, effective July 1, 2014, are mandatory statewide and exceed the 2012 IECC standards for residential buildings and ASHRAE/IESNA 90.1-2010 for commercial buildings. California's voluntary reach standards, which local governments are encouraged to adopt as mandatory, are adopted in the California Green Building Standards Tier 1 and Tier 2, effective July 1, 2014.	5
Colorado	Colorado is a home-rule state with a voluntary building code for both residential and commercial construction. The 2003 IECC is the 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 multifamily structures—commercial and residential—in areas that do not adopt or enforce building codes. As of June 2013, 95% of new buildings comply with the 2009 or 2012 IECC standards and the average Home Energy Rating System (HERS) rating for new homes was 59 as of April 2014.	3

State	Building code stringency	Score
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 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, but it has not yet become effective. Connecticut's Codes and Standards Review committee is revising the 2012 IECC code to ensure that it is consistent with state law. Subsequently, it will be submitted to the Legislative Regulation Review Committee for approval. The 2012 IECC is progressing through the regulatory revision adoption process and is expected to be approved soon, but no date has been provided. Connecticut's High Performance Building standards also require state-owned new construction or renovation projects to meet energy performance standards that are 21% better than the most current Connecticut state building energy code.	3
Delaware	Delaware has adopted the 2012 IECC, with amendments, and ASHRAE 90.1-2010. The new codes were published May 11, 2014, and will become fully effective after a six-month grace period.	4
District of Columbia	The District of Columbia's energy code is mandatory for all construction projects in the District. As of March 28, 2014, all new construction projects must comply with the 2013 D.C. Energy Conservation Code, which is roughly equivalent to the 2012 IECC and ASHRAE 90.1-2010. The District also has a Green Construction Code based on the International Green Construction Code that applies to all commercial construction projects 10,000 square feet and larger and all residential projects that are 10,000 square feet and larger and four stories or higher.	4.5
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 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).	4
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 with 2011 Georgia amendments, as an optional code. It is available for local government adoption and enforcement.	3
Guam	Guam has adopted the International Building Code® (IBC), 2009 edition; however, the IECC and the Guam Tropical Energy Code were held in abeyance for further analysis on applicability by the Guam Building Code Council. Resubmission is pending for fall 2014.	3

State	Building code stringency	Score
Hawaii	On February 14, 2012, the Hawaii Building Code Council adopted the IECC 2009 with Hawaii amendments as Hawaii's updated building energy code. However, only Kauai County has adopted the state code; the remaining counties still follow the 2006 IECC. In 2014, Hawaii passed Act 164 directing that upon the State Building Code Council's adoption of updated codes, counties will have two years to amend and adopt the code or the updated code will become interim county code. The Energy Committee of the Hawaii Building Code Council has commenced work on amending the IECC 2015, as lack of County Building Division staffing does not permit them to amend codes in a timely fashion. The Energy Committee also is initiating development of a Tropical Zone Climate Code through the latest action by the IECC.	2
Idaho	Effective January 1, 2015, the 2012 IECC will be mandatory statewide for residential and commercial new construction, the latter with reference to ASHRAE 90.1-2010. However, the state incorporated amendments to the residential codes that removed all the energy efficiency improvements from the 2012 IECC, so the codes are still equivalent to the 2009 IECC.	3.5
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. As of March 2014, residential buildings must comply with the 2012 IECC, with amendments, while the commercial buildings must also comply with the 2012 IECC, with reference to ASHRAE 90.1-2010. The Iowa Department of Public Safety has a memorandum of understanding with the Iowa State Energy Office to adopt and enforce the building codes.	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 mandates residential buildings must comply with the 2009 IECC or IRC with state amendments. The 2007 Kentucky Building Code (KBC) states that commercial construction must comply with the 2009 IECC or the 2009 IBC with state amendments. On February 20, 2014, the Board of Housing, Buildings and Construction voted to approve adoption of the 2012 IECC and 2010 90.1 ASHRAE Standard for application with projects constructed under the 2013 KBC. The amended regulations were filed with the legislature on April 8, 2014.The effective date of these documents will be October 1, 2014.	3.5

State	Building code stringency	Score
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 multifamily residential construction must comply with the 2009 IECC, while multifamily residential construction over three 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 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 code December 1, 2010. Towns with a population of 4,000 that 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 meant that only 89 of Maine's 533 municipalities (based on 2010 census data) were required to comply with energy efficiency codes, which meant the requirement applied to approximately 60% of the state's population. Smaller municipalities may adopt the uniform code, but are not required to.	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 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	In 2013, Massachusetts adopted the 2012 IECC and ASHRAE Standard 90.1-2010, with an effective date of July 1, 2014. The Massachusetts amendments add a HERS compliance path for units that receive a HERS rating of 65 or less, and a compliance path for buildings that use the Passive House software (PHPP). Massachusetts has achieved broad adoption of the 2009 Massachusetts Stretch Energy Code. It is currently adopted in 140 towns and cities representing over 50% of the state population. The Massachusetts Stretch Energy Code requires HERS ratings for all new residential construction at a level of 65/70 based on whether the unit is above or below 3,000 square feet. For commercial buildings, it requires a prescriptive code similar to the 2012 IECC for new buildings from 5,000–100,000 square feet, and a 20% improvement over the ASHRAE 90.1-2007 standard for all new buildings over 100,000 square feet and selected high-energy-using building types over 40,000 square feet.	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. Commercial buildings are required to comply with ASHRAE 90.1-2007.	3
Minnesota	Both Minnesota's residential and commercial building codes, the 2007 Minnesota State Building Code, are mandatory statewide. The current residential code (Chapter 1,322) is based on Chapter 11 of the 2006 IRC with amendments. On August 18, 2014, the Minnesota state registrar published the Department of Labor and Industry's new residential code establishing the adoption of the IECC 2012 residential energy code. The effective date of the new residential energy code is six months from the date of adoption. The commercial code (Chapter 1,323) is based on ASHRAE 90.1-2004 with amendments. The 2007 Minnesota State Building Code became effective June 1, 2009.	3

State	Building code stringency	Score
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 2013, the Mississippi legislature passed and Governor Phil Bryant signed laws setting the mandatory energy code standard for commercial and state-owned buildings as ASHRAE 90.1-2010, which took 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 the Mississippi Development Authority, 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 the 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 "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." 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 Administrative Rules of Montana Title 24, Chapter 301.160, are mandatory statewide. Effective April 2014, Montana's residential code requires compliance with the 2012 IECC, with amendments. The commercial building code requires compliance with the 2012 IECC.	4
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, although none have officially done so. Nonetheless, 100% of new homes fall under the 2009 IECC, as the NEC is the minimum standard.	3
Nevada	Nevada Revised Statute 701.220 requires the director of the Governor's Office of Energy to adopt the most recent version of the IECC. On March 27, 2014, the director adopted the 2012 IECC for residential and commercial codes, which will become effective on July 1, 2015. The 2012 IECC will be effective for commercial and residential buildings statewide. The Commercial Code ASHRAE Standard 90.1-2010 becomes effective on July 1, 2015. Jurisdictions may adopt codes that are more stringent than the state mandate, though none have yet done so.	4
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, though jurisdictions may adopt codes that are more stringent.	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

State	Building code stringency	Score
New Mexico	New Mexico is a home-rule state, though its energy codes are mandatory statewide. The Construction Industries Division (CID) of the Regulations and Licensing Department covers all areas of the state that are not covered by cities, towns, or county building officials. 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. A local jurisdiction can adopt a code that exceeds the state minimum. The city of Santa Fe and town of Taos have adopted green building codes that are more stringent than the 2009 IECC and require LEED Silver at a minimum. Builders can also use the New Mexico 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 ENERGYSTAR, minimum HERS scores, benchmarking, and early adoption of the 2012 IECC. As of May 23, 2014, the state has moved into the rulemaking process for adoption of the 2012 IECC and ASHRAE 90.1-2010 for commercial buildings, with a projected effective date of October–December of 2014.	3.5
North Carolina	The 2012 North Carolina Energy Conservation Code 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 in 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 requirements.	1
Ohio	Both Ohio's residential and commercial energy codes are mandatory statewide. Effective January 1, 2013, the residential code references 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 mandatory statewide building codes for residential and commercial buildings. 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. Beginning in October 2010, OUBCC held several meetings discussing code change proposals. On March 31, 2011, OUBCC formally recommended a residential code based on the 2009 IRC with Oklahoma amendments. The statute became effective July 15, 2011. In January 2012, OUBCC submitted recommendations for approval by the Oklahoma legislature to adopt several of the 2009 ICC code editions, including the 2009 IBC. The recommended code was approved by the Oklahoma Legislature and the governor, effective November 1, 2012.	3

State	Building code stringency	Score
Oregon	The 2011 Oregon Residential Specialty Code (ORSC) and the 2010 Oregon Energy Efficiency Specialty Code (OEESC), for commercial new construction, 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. The 2010 Oregon Reach Code, the state's stretch code, is available for use in any jurisdiction.	3.5
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 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 31 of the year in which they are issued.	3
Puerto Rico	The 2011 Puerto Rico Building Code is a compilation of amendments, fully compatible with all the 2009 international codes published by ICC, including the IBC, the IRC, the International Mechanical Code, the International Plumbing Code, the International Fire Code, the International Fuel Gas Code, IECC, the International Existing Building Code, and the International Private Sewage Disposal Code. On March 1, 2011, all Sections were available for adoption except for Division VIII (IECC) and energy requirements of Division II (IRC), which were adopted progressively in accordance to the Building Occupancy Group. A grandfather clause covered some projects until March 1, 2012, but after that, all new projects submitted to the Permits Office should conform to all the requirements of the code, except for those divisions stated above. As of March 1, 2014, only groups M, U (which shall comply after March 1, 2015), B, R-3, and R-4 (which shall comply after March 1, 2016) were still exempted to comply with the IECC, and one- and two-dwelling units with the energy requirements of the IRC (which shall comply after March 1, 2016).	3
Rhode Island	Effective October 1, 2013, Rhode Island requires compliance with the 2012 IECC for both residential and commercial buildings, with state-specific amendments. 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. In 2013, Rhode Island mandated that all state buildings adhere to the International Green Construction Code. While there is no current stretch code, as part of Rhode Island's Energy Efficiency Procurement Plan, a Building Codes and Standards Initiative has been approved by the Rhode Island Public Utilities Commission, and a stated feature is the development of a stretch code targeting "15% more energy than buildings constructed according to the prevailing path." This effort is being pursued in conjunction with the Rhode Island Building Code Commission and the Rhode Island Builders Association.	4
South Carolina	The 2013 South Carolina Energy Standard became effective in January 2013. The residential provisions reference the 2009 IECC. The commercial provisions reference the 2009 IECC as well, including that code's reference to ASHRAE Standard 90.1-2007 as an alternative compliance path. Local jurisdictions may adopt more stringent energy codes.	3
South Dakota	South Dakota has no mandatory statewide energy codes for residential or commercial construction. Codes are adopted by jurisdictions 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 under state law unless local jurisdictions have either opted out of it or specifically adopted another code.	1

State	Building code stringency	Score
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's building codes are mandatory for both residential and commercial construction. Effective January 1, 2012, the Texas Building Energy Performance Standards require 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 90.1-2010. For all buildings, jurisdictions can choose to adopt more stringent standards. More than 50 jurisdictions, representing approximately 5.3 million people, have adopted codes more stringent than the minimum state requirements.	3
U.S. Virgin Islands	In accordance with Title 29, Chapter 5 of the Virgin Islands Code, the IECC and any subsequent revisions to it are adopted and incorporated by reference as a part of the Virgin Islands Building Code and are applicable to every public, commercial, and residential building or structure in the Virgin Islands. Currently, the Virgin Islands Building Code requires compliance with the 2009 IECC.	3
Utah	Utah's Uniform Building Code for residential and commercial building energy codes is mandatory statewide. Residential construction must comply with the 2006 IECC, with references to provisions in the 2009 and 2012 IECC. Commercial construction must comply with the 2009 IECC, with reference to ASHRAE 90.1-2007.	3
Vermont	Vermont's 2011 Residential Building Energy Standards (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 update its codes every three years. The Vermont Department of Public Service (DPS) is in the process of updating the current residential and commercial energy codes to the 2015 IECC or better and anticipates adoption by December 2014 with an effective date of March 2015. As specific amendments are still under discussion, savings from energy efficiency stipulations are still unclear. Act 89 of 2013 gives the Vermont DPS the authority to develop stretch codes and municipalities have the option of adopting them.	4
Virginia	Virginia's Uniform Statewide Building Code (USBC) is mandatory statewide for residential and commercial buildings. As of July 14, 2014, the USBC was updated to reference the 2012 IECC and 2012 IRC. Residential buildings must comply with the 2012 IRC; however, a few technical amendments were made to the residential energy code requirements and no significant improvements were adopted, rendering the residential code equivalent to the 2009 IECC. Commercial buildings must comply with the 2012 IECC, with reference to ASHRAE 90.1-2010.	3.5
Washington	The 2012 Washington State Energy Code is a state-developed code that is mandatory statewide. As of July 1, 2013, 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%. However, equipment tradeoffs render the codes equivalent to the 2012 IECC.	4

State	Building code stringency	Score
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 new commercial code as September 1, 2013, while the new residential code became effective November 30, 2013.	3
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 whether 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 and 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 codes that are more stringent than the voluntary standard: The eight 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 in the fall of 2014; Cheyenne adopted the IECC 2009; Casper, Rock Springs, and Gillette adopted a modified IECC 2006.	1

Appendix H. Summary of Building Code Compliance Efforts

State	Compliance efforts	Score
Alabama		
Gap analysis/strategic compliance plan	In 2010, BCAP and the Southeast Energy Efficiency Alliance (SEEA) developed the Alabama gap analysis and an Implementation Action Kit. Alabama was also chosen as one of four states to receive energy code compliance evaluation and implementation assistance through Pacific Northwest National Laboratories (PNNL). PNNL developed an Alabama Energy Code Compliance Evaluation and Implementation Guide, published in September 2012.	
Training/outreach	The Alabama Department of Economic and Community Affairs has been actively providing energy code training for many years. Recent efforts include specific training on the new Alabama Energy and Residential Code (AERC) targeted toward all building industry professionals as well as building and code officials and inspectors. Planned efforts include working with the AERC Board to engage at the municipal and county levels to increase code understanding, awareness, and compliance. The AERC Board is also developing a speakers bureau to provide outreach and education to code officials statewide through local chapters of the Code Officials Association of Alabama and other industry-specific boards and organizations.	
Total		0.5
Alaska		
Gap analysis/strategic compliance plan	BCAP chose Alaska to assist with the development of its gap analysis and a strategic plan, which were completed in late 2012.	
Training/outreach	The Alaska Housing Finance Corporation actively has classes for contractors, building officials, and others to train them to be in compliance with the Alaska Building Energy Efficiency Standard. However, training budgets have been severely limited in recent years.	
Total		0.5
Arizona		
Utility involvement	Four of Arizona's utilities are actively involved in code-related efforts. Up to one-third credit of savings from building energy codes can be claimed by utilities to count toward annual savings goals. Utilities must demonstrate and evaluate the savings that they claim.	
Training/outreach	The Governor's Office of Energy Policy works with utilities, specifically Arizona Public Service and Salt River Project, on education related to energy efficiency codes. The utilities are allowed, per the state's energy efficiency standards, to count the training toward their energy efficiency requirements. Arizona Building Officials also sponsors workshops/trainings on codes throughout the year.	
Total		0.5
Arkansas		
Gap analysis/strategic compliance plan	BCAP conducted a gap analysis in 2010.	
Training/outreach	The Arkansas Energy Office (AEO) has grant with the U.S. Green Building Council (USGBC) Arkansas chapter to conduct commercial code classes around the state and a grant with the Arkansas Homebuilders Association to conduct residential code classes around the state. AEO will utilize Pulaski Technical College's Building Sciences Center of Excellence to conduct residential code training for builders, contractors, code officials and other building professionals in coordination with SEEA.	

State	Compliance efforts	Score
Total		0.5
California		
Gap analysis/strategic compliance plan	The California Public Utilities Commission (CPUC), in collaboration with the Energy Commission, adopted the state's Long Term Energy Efficiency 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; covers government, utility, and private sector actions; and holds energy efficiency to its role as the highest-priority resource in meeting California's energy needs. The strategic plan established the Big Bold Energy Efficiency Strategies (BBEES), which calls for all newly constructed residential buildings to be zero net energy (ZNE) by 2020 and all newly constructed commercial buildings by 2030. The Codes and Standards Action Plan and Zero Net Energy Action Plan add detail to the strategic plan. In addition, the CPUC and IOUs conduct EM&V studies to investigate ways to improve compliance with the standards. The IOU Compliance Enhancement Program developed a best practices report based on a gap analysis of seven building departments. The 2013–14 EM&V Roadmap includes a process evaluation of the compliance-improvement activities conducted by the IOUs and the Bay Area Regional Energy Network (BayREN).	
Baseline and updated compliance studies	The CPUC completed evaluations of building energy code compliance for the 2006–08 program cycle in 2010, which can be found on the CALMAC website. Evaluations of the 2010–12 program cycle are currently underway and will be published in 2014. The 2013–14 EM&V Roadmap includes priorities for codes and standards research, including evaluation of compliance for multifamily buildings and updates for residential and potentially nonresidential compliance.	
Utility involvement	California is a national leader in collaboration with the PUC and IOUs in implementation of the standards and improvement of compliance. The utilities' new construction programs, in close coordination with California's solar electric incentives programs, provide incentives to achieve California's reach standards, pulling builders and other industry professionals through the learning curve necessary to sustain ongoing advancement of mandatory standards toward ZNE. The CPUC and IOUs also provide technical support to many local governments who adopt stretch standards as mandatory in their jurisdictions. Through the Energy Code Ace program and other compliance-improvement initiatives, the IOUs also conduct in conjunction with the Energy Commission an ongoing program of development of compliance tools, including collaboration on building performance standards compliance software, form streamlining, and compliance training to a variety of stakeholders, including builders, building departments, trades people, engineers, and architects. The CPUC also approved BayREN to conduct initiatives to improve compliance with the standards in the nine counties in the San Francisco Bay Area region.	
Stakeholder advisory group	The Energy Commission and other collaborators actively work to improve compliance through two major stakeholder advisory groups, the Western HVAC Performance Alliance Compliance Committee and the Compliance Improvement Advisory Group. These groups on an ongoing basis do gap analysis and develop white papers regarding compliance issues, and undertake initiatives to address recommended improvements. The Energy Commission also works closely with the Contractors State License Board (CSLB) to address contractor failure to pull permits for alterations to existing buildings and willful noncompliance. CSLB conducts stings and sweeps in conjunction with the multiagency Joint Enforcement Strike Force.	

State	Compliance efforts	Score
Training/outreach	The Energy Commission, IOUs, and other stakeholders conduct ongoing training and outreach throughout the state. The Energy Commission maintains a telephone hotline where building departments and building professionals can get answers to questions regarding how the standards requirements apply to individual construction projects. The commission also provides the *Blueprint* newsletter to keep building departments and the industry informed. The commission also provides training videos through the Online Learning Center that building officials, contractors, and others can use to learn about California's energy standards as well as to earn continuing education credits. In collaboration with the Energy Commission and the CPUC, the California Association of Building Energy Consultants conducts an ongoing training and certification program for energy consultants to demonstrate proficiency with the standards. The 2013 standards also established a training and certification program for professionals who provide accepting testing for ensuring quality installation of nonresidential HVAC and lighting equipment and controls.	
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 (ECCC). 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 and updated compliance studies	Colorado completed an evaluation of energy code compliance in the state in 2013. It found a rate of over 90% compliance for residential construction, noting that more work could be done with respect to HVAC systems. It also found that compliance with commercial codes is lagging behind residential. This compliance study was prepared in conjunction with the ECCC, and is available on the Colorado Energy Office (CEO) website.	
Utility involvement	In conjunction with the Colorado Public Utilities Commission (CPUC), Xcel Energy (the state's largest utility) has supported code compliance though the Building Energy Code Support Pilot. The pilot program was designed to work with local communities to adopt 2009 IECC standards or better and achieve compliance with them.	
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.	
Training/outreach	The state actively provides training for appraisers and realtors, two of the most crucial parties in the promotion of building efficiency. CEO initiated the Appraisal Institute's Green Valuation Professional Program. CEO will continue to offer education as part of the MoU signed with the Appraisal Institute–Colorado Chapter and the Colorado Coalition of Appraisers. CEO has also partnered with the U.S. Department of Housing and Urban Development, EPA, and other third 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		2

State	Compliance efforts	Score
Connecticut		
Gap analysis/strategic compliance plan	A proposal to conduct third-party plan review and site studies has been approved by the Department of Energy and Environmental Protection (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 (ISE), 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.	
Baseline and updated compliance studies	In 2014, the Connecticut Energy Efficiency Board approved two new code compliance studies: (1) The R51 or residential study will assess progress toward the ARRA fund recipient requirement that Connecticut achieve a 90% energy code compliance rate by 2017, and (2) the C&I evaluation will assess the energy code compliance rate, as well as describe baseline equipment in C&I new construction for specified end-use measures to support program planning and estimating program savings and for current and near-term evaluation of the program.	
Utility involvement	Electric utilities provide building energy code compliance training and materials regularly across the state. Utilities conducted four training sessions in 2013 and seven training sessions in 2014. Utilities also conducted two 48-hour training courses for contractors on commercial auditing of energy efficiency projects, which included a review of building energy code compliance requirements.	
Stakeholder advisory group	A committee that includes the Office of Construction Services, DEEP, the utility representatives, ISE, and NEEP meets regularly to review progress on the gap analysis and the strategic compliance plan. The state of Connecticut is cooperating with 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	In April and May of 2014, DEEP sponsored the Building Operator Certification 1 and 2 level training course. The purpose was to educate facility managers on the efficient operation of buildings, and the format included lectures, small group exercises, and facility tours. The state also continues to offer career development to encourage partnerships with regional, state, and local architects, building officials, designers, engineers, and trade professionals. ISE at Eastern Connecticut State also developed a training course for contractors working on the state's Small Business Energy Advantage program. The course is designed to assist small business owners in reducing their energy consumption, improving their energy efficiency, and providing technical and financial support to achieve sustainability and energy goals. ISE is also involved with training for state of Connecticut employees to become green professionals through the USGBC Urban Green Council New York Chapter GPRO Operations and Maintenance Plus Program. This program aims to educate building operators and other personnel on the benefits of sustainability in building construction and operation. Building code compliance is covered, along with energy-saving operation and maintenance practices and efficient HVAC equipment, lighting, materials, water systems, and building automation. Lastly, DPUC Docket 06-10-02 charged ISE with completing facility manager training for schools, including code compliance issues, energy efficiency, and connecting to financing programs and initiatives. In 2012–13, the state extended that training to include college and university facilities staff.	

State	Compliance efforts	Score
Total		2
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.	
Baseline and 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 and Climate is working with NEEP and BCAP to bring any available training to contractors and code officials. Delaware held 2012 IECC and ASHRAE 90.1-2010 standards training for code officials and builders in summer 2013. Additional 2012 IECC and ASHRAE 90.1-2010 training will be held throughout 2014.	
Total		2
District of Columbia		
Gap analysis/strategic compliance plan	The District Department of Consumer and Regulatory Affairs (DCRA) established the Green Building Division in late winter of 2013 to specifically focus on the strategic assessment and implementation of the 2013 D.C. Energy Code, 2013 Green Code, the Green Building Act, and other related regulations in the city. The division is currently in the process of developing a robust implementation program.	
Training/outreach	DCRA educates contractors and code officials on how to comply with the building codes. In fiscal year 2013, DCRA conducted extensive mandatory trainings on the commercial and residential 2012 IECC for all DCRA staff and third-party plan reviewers and inspectors. DCRA and other District agencies have also conducted dozens of trainings on the 2013 DC Green Construction Code and Energy Conservation Code for contractors, architects, engineers, developers, and other stakeholders in the building community.	
Total		0.5
Florida		
Gap analysis/strategic compliance plan	The Florida Solar Energy Center (FSEC) completed a baseline compliance study in 2012 that 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. FESC 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 and updated compliance studies	The FSEC completed a baseline compliance study in 2012 that was submitted to the DBPR. The report presents data on energy code enforcement and compliance rates and makes recommendations for targeting areas known to improve compliance.	
Stakeholder advisory group	The Energy Technical Advisory Committee to the Florida Building Commission holds regular meetings on a number of building-related issues, including building energy codes.	

State	Compliance efforts	Score
Training/outreach	A multifaceted 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 and energy code webinars by the Codes and Standards Office of DBPR.	
Total		2
Georgia		
Gap analysis/strategic compliance plan	The Georgia Environmental Finance Authority (GEFA) and the Georgia Department of Community Affairs 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.	
Total		0.5
Guam		
Gap analysis/strategic compliance plan	Guam's Strategic Energy Plan, published in July 2013, contains recommendations for building energy code compliance.	
Stakeholder advisory group	The Guam Building Code Council seeks input from stakeholders when proposing changes to its building codes.	
Training/outreach	The Guam Energy Office (GEO) has a grant from the U.S. Department of the Interior of $150,000 for the training of officials and stakeholders once the Guam Tropical Energy Code has passed, but no training activity has been conducted yet. The Guam Building Code Council plans to partner with GEO and the Department of Public Works for future training. GEO has also provided grant money to Guam Community College for public outreach and for curriculum development.	
Total		1
Hawaii		
Stakeholder advisory group	The Hawaii Building Code Council (HBCC) was created by the state legislature in 2007 to promulgate updated codes in accord with national three-year code cycles, and regularly convenes stakeholders to discuss relevant issues.	
Training/outreach	The Hawaii State Energy Office (SEO), working with various counties, has provided a number of training workshops. Through its website, SEO also provides building code information and training materials provided at the workshops. The Hawaii Building Code Council and Department of Business, Economic Development and Tourism lobbied actively for the passage of Senate Bill 2581, which would provide HBCC with a full-time administrator and assistant administrator. These individuals would assume most of the logistical details of adopting updated codes, including educating affected parties about code details. SB 2581 passed the 2014 State Legislature and is currently on the governor's desk. In addition, SEO is finalizing an $80,000 contract with an energy code consultant to include training.	
Total		0.5
Idaho		
Gap analysis/strategic compliance plan	In June 2011, the Idaho Energy Code Collaborative published a plan for 90% compliance with the 2009 IECC by 2017, tasked by PNNL.	

State	Compliance efforts	Score
Baseline and 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. NEEA, with additional support from Idaho Power and Avista Utilities, 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 109% result from energy modeling shows that many homes go beyond the minimum requirements.	
Stakeholder advisory group	The Idaho Energy Code Collaborative discusses code compliance, but that is not the main focus.	
Training/outreach	NEEA provides funding for training; DBS does not budget specifically for training, but energy-related codes requirements are integrated into training materials. The OER and DBS work in cooperation with stakeholders of the Idaho Energy Code Collaborative to provide energy code training 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, the Idaho Association of Building Officials, and other members of the Idaho Energy Code Collaborative.	
Total		2
Illinois		
Gap analysis/strategic compliance plan	The state Energy Office (Illinois Department of Commerce and Economic Opportunity) worked with BCAP to complete a gap analysis.	
Baseline and updated compliance studies	The state Energy Office received a federal grant to conduct a compliance study to test DOE's recommended methods for measuring building codes compliance rates. 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 of jurisdictions. The compliance rate for commercial buildings was over 90%, but a full statistically valid sample was not completed. Evaluation of codes compliance and energy savings attributable to the training and technical assistance programs has now been built into the annual EM&V of the state's Energy Efficiency Portfolio.	
Utility involvement	Illinois's utilities are involved in the Illinois Code Collaborative, providing training, technical assistance, and rebates for third-party inspectors. See below for more information.	
Stakeholder advisory group	The state Energy Office sponsored 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. This effort has grown into an Illinois Codes Collaborative with a governance board composed of representatives of the Illinois utilities and the state Energy Office. The Illinois Commerce Commission has approved this statewide effort as a component of the utilities' and the state Energy Office's three-year Energy Efficiency Portfolio Plan with a three-year budget of approximately $8 million. In addition to expanded training and technical assistance, the collaborative will include rebates for third-party inspectors to verify code compliance and leasing of equipment (such as blower doors and duct blasters).	

State	Compliance efforts	Score
Training/outreach	The Illinois Energy Office spends approximately $450,000 annually on its Building Codes Education and Technical Assistance program, providing training on the most current IECC-based commercial and residential codes to approximately 1,200 building professionals each year. These programs also include blower door training, HVAC right-sizing training, and a code interpretation hotline. In a new effort, the Illinois Energy Office conducted 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. Utilities will be paying these rebates in the future.	
Total		2
Indiana		
Training/outreach	The Division of Fire and Building Safety of the Indiana Department of Homeland Security 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 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 IECC for the residential and commercial sectors.	
Baseline and updated compliance studies	The DOE Residential Energy Code Pilot Study for Iowa was completed 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 MidAmerican Energy have for the past two years sponsored daylong 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 Code 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 30 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 groups ranging from the American Institute of Architects to the International Association of Electrical Inspectors. The state Building Code Bureau has teamed up with the state IOUs, the Iowa Association of Building Officials, and the Iowa Association for Energy Efficiency to provide training throughout the state.	
Total		2
Kansas		
Baseline and updated compliance studies	The Kansas Corporation Commission (KCC) annual survey of local jurisdictions provides an initial baseline for assessing adoption and compliance.	

State	Compliance efforts	Score
Stakeholder advisory group	In 2013, KCC established the Kansas Codes Collaborative, a stakeholder group involving utilities, local codes officials, and others. The new collaborative builds 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.	
Training/outreach	KCC partners 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 BCAP to complete a gap analysis and strategic compliance plan in 2011.	
Stakeholder advisory group	The Department of Housing, Buildings and Construction (DHBC) has a mandated obligation to host meetings with the Board of Housing, Buildings and Construction. This multi-stakeholder group represents a diverse cross-section of industry and advocacy groups. This group regularly provides feedback to the agency on code activities. Furthermore, the Department for Energy Development and Independence (DEDI), along with its sister agency the Department of Housing, Buildings and Construction, has frequently held meetings with utilities and other stakeholders in an effort to discuss means of improving communications and coordination of activities, messaging, and compliance relative to energy code compliance.	
Training/outreach	DEDI has offered an aggressive training program to builders in recent years, including training on Manual J for HVAC installers, energy codes for builders, and a statewide network of training sessions for the commercial building design community. All building inspectors receive ongoing in-service training and are certified.	
Total		1
Louisiana		
Training/outreach	State Energy Office staff attend regular code council meetings to provide support to code officials. Presently, there are no new training classes scheduled due to pending legislation, but further classes are expected in the very near future.	
Total		0.5
Maine		
Baseline and updated compliance studies	In 2013, the Governor's Energy Office surveyed all code enforcement officers in the 88 municipalities required to adopt MUBEC. For the 2012 calendar year, 99.7% of homes and commercial buildings constructed were in compliance (excluding buildings still under construction or awaiting final inspection).Compliance was determined by the number of building permits issued versus occupancy permits, or inspections performed by a third-party inspector.	
Stakeholder advisory group	The Maine Department of Public Safety Bureau of Building Codes and Standards has an advisory board (Building Codes and Standards Board), comprised of stakeholders, to provide input on building energy efficiency.	

State	Compliance efforts	Score
Training/outreach	There is advanced energy code training available; the cost is subsidized for code officials. This advanced training is a collaborative effort between the Department of Economic and Community Development, the State Fire Marshal, and the Energy Office. The state Department of Economic and Community Development offers training at the basic certification level (free to those applying for initial certification), as well as advanced energy code training. Once certified, code enforcement officers need to obtain training annually to keep their certification current. The Maine Building Officials and Inspectors Association, as well as several regional organizations, seek out training opportunities for their members, and partially support the cost of these opportunities.	
Total		1.5
Maryland		
Baseline and updated compliance studies	Maryland is a home-rule state, but has an ongoing statewide effort to determine the rate of code compliance in various counties. To date, compliance studies have been completed in two of the state's largest counties—Howard and Montgomery—and studies in other counties are ongoing and will be completed on a rolling basis.	
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.	
Stakeholder advisory group	MEA established a Codes Compliance Work Group (CCWG) in 2012. CCWG was put together last year and met three times to give input and direction to MEA's efforts in 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	DHCD, Codes Administration, held training through 2012 and into 2013 on the IECC—Significant Changes and Fundamentals Seminar. MEA is actively providing on-site trainings with 10 training sessions scheduled for 2014. MEA also provides an Energy Code Coaching service that is available by email or telephone.	
Total		2
Massachusetts		
Baseline and updated compliance studies	In the past two years, Massachusetts's 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 and homes built to ENERGY STAR (over a third of new construction), and 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. The IECC 2009 home compliance rate and the commercial compliance rate are unknown. Enforcement is performed by local building code officials. In the 140 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, which ties into ratepayer-funded new construction incentives.	

State	Compliance efforts	Score
Utility involvement	A framework of savings attribution for utilities is being developed. Current utility-sponsored trainings and compliance support are being implemented on a pilot basis with a view to a broader program in coming years.	
Training/outreach	The Green Communities Act requires the Board of Building Regulations and Standards and DOER to develop specific energy efficiency training and certification for all local code officials. No training has been conducted to date in 2013–14 as Massachusetts awaits code cycle updates to the 2012 IECC/ASHRAE 90.1-2010.In the current 2012 IECC adoption cycle, the state is shifting from state energy office–sponsored training to energy utility–sponsored code training and compliance support activities under the broader Mass Save energy efficiency programs. Trainings are expected to begin in summer 2014.	
Total		1.5
Michigan		
Gap analysis/strategic compliance plan	Partnering with BCAP, the state completed a gap analysis and strategic compliance plan, both in 2011.	
Training/outreach	The state energy office recently dedicated some U.S. DOE State Energy Program funding for training to be conducted through Michigan State University (MSU). In the past year, MSU provided five separate training sessions for approximately 200 participants. Otherwise, a number of code official organizations provide regular training throughout the state. The Bureau of Construction Codes also provides code training.	
Total		0.5
Minnesota		
Baseline and updated compliance studies	In September 2013, the Minnesota Department of Labor and Industry submitted a code compliance study to the Minnesota Department of Commerce. The study estimated the weighted average of residential building compliance with provisions of the 2009 IECC at about 76.8% and commercial building compliance at 91.8%.	
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		1.5
Mississippi		
Baseline and 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 the Mississippi Development Authority, 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.	

State	Compliance efforts	Score
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.	
Training/outreach	The Mississippi Development Authority Energy and Natural Resources Division has sponsored eight energy code training workshops across the state between August 2013 and May 2014 in order to educate architects, engineers, and code officials about the state's mandatory commercial energy code. Additionally, training sessions are planned to be offered at the Building Officials Association of Mississippi's annual conference in June 2014, which will specifically work to inform the state's building code officials.	
Total		1.5
Missouri		
Gap analysis/strategic compliance plan	In 2011, Missouri completed a gap analysis with assistance from BCAP.	
Stakeholder advisory group	In 2013, the Division of Energy created a compliance working group to assist in development of a plan to evaluate compliance with the ARRA Section 410 provisions related to building energy codes. However, additional work in assessing code compliance has been delayed due to staffing resources. 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.	
Total		0.5
Montana		
Gap analysis/strategic compliance plan	The Montana Department of Environmental Quality (DEQ) is currently hosting a stakeholder group whose purpose is to develop a strategic compliance plan to be finalized in August 2014. The plan will include a gap analysis to help identify recommendations for improvement.	
Baseline and updated compliance studies	In 2012, NEEA commissioned a study conducted by Cadmus to determine energy code compliance in Montana. Although the study is interesting, the results are questionable due to sample size, lack of return visits, and items analyzed. It has not been updated in the past two years.	
Utility involvement	Although no utility commission guidelines have been established, utility providers in Montana support energy code compliance activities through the sponsorship of training events, testifying at adoption hearings, and supporting agencies such as NEEA in their outreach efforts.	
Stakeholder advisory group	The Montana Energy Code Collaborative is coordinated by NEEA and the National Center of Appropriate Technology. In 2013, DEQ initiated another stakeholder group to specifically address the need for a strategic plan and develop a long-term work plan to implement the strategic plan. This DEQ-sponsored group meets approximately every two months.	

State	Compliance efforts	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 on-site trainings with building code departments and contractors utilizing a blower door and infrared camera. DEQ also provides a two-credit-hour energy code training session to real estate professionals and estimates that 40% of Montana real estate sales staff have attended a training session. With the adoption of the 2012 code, training has stepped up dramatically, with offerings of conference workshops, webinars, and multiple training opportunities across the state. Additionally, the state is in the process of developing a marketing campaign directed at home purchasers to educate them on energy code compliance.	
Total		2
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 and updated compliance studies	Nebraska has completed two studies and a third study will be completed in June 2014. The Energy Office completed an 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%. The highest compliance score was 83.67%, the lowest was 42.55%. Regional compliance rates were also calculated. A summary of the compliance code evaluation can be found here. By using a larger sample, the agency was able to evaluate homes in smaller code jurisdictions, which was essential in designing specific training to address code jurisdiction staff deficiencies. The Energy Office also assisted in a code compliance study conducted by the Institute for Market Transformation. The study of 42 Nebraska homes in the three metropolitan counties (where 75% of new residential construction occurs) was completed in June 2013. The study also provides an assessment of the effectiveness of the localized, customized, one-on-one training being provided to codes staff members by an Energy Office contractor (retired codes official). This study estimated that the training provided had increased compliance by about 9%, for a statewide average of 75% compliance. A third study, which encompasses assessing energy building code compliance for commercial buildings, has been completed and the draft report is being written. The draft final report findings indicate the statewide average rate of compliance for commercial buildings is 83.2%.	
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.	

State	Compliance efforts	Score
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. The collaborative meets at least quarterly and continues to work at the committee level on issues of relevance, such as training and funding sources.	
Training/outreach	The state actively recruits codes officials, builders, designers, and other professionals for workshop opportunities. At least four distinct types of training/information opportunities for codes officials and others have been provided since the 2013 submission: ASHRAE, REScheck™, and COMcheck for 2009 and 2012, and right-sizing HVAC systems, all of which were first-time offerings. The Energy Office is continuing to provide customized, localized, one-on-one technical assistance to local code jurisdictions. This effort, begun in 2012, utilizes the findings of the code compliance evaluation of 100 homes to identify deficiencies in each code jurisdiction. A specific training course is developed by a highly respected, retired code official who then works one-on-one with local code staff to strengthen the identified areas of weakness. To date, nearly all of the state's 29 code jurisdictions have received the customized training and additional sessions were provided in the metropolitan counties for intensive plan review compliance.	
Total		2
Nevada		
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 ARRA funding to pilot its Building Energy Codes Program, developed compliance tools to learn how local jurisdictions will/can use the tools, and the time and expense it will cost the local jurisdictions.	
Baseline and updated compliance studies	A survey on energy code compliance rates was conducted in 2010 and revised. The Governor's Office of Energy (GOE) is a supporting partner of a grant proposal recently submitted to DOE to establish baseline energy code compliance rates and to increase public education and outreach.	
Utility involvement	NV Energy (Nevada's largest IOU and the major provider in the state) has been very supportive by hosting GOE-sponsored training sessions on energy codes, including providing lunch for attendees and providing any necessary equipment to make the training effective.	
Stakeholder advisory group	GOE partnered with BCAP to develop the Nevada Code Collaborative, which first met in April 2012, and has also named seven Code Ambassadors. SWEEP continues to facilitate the collaborative.	
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. GOE continues to work with PNNL and contractors to provide training on the *Nevada Compliance Implementation and Evaluation Guide* to building code officials and the building industry.	
Total		2

State	Compliance efforts	Score
New Hampshire		
Gap analysis/strategic compliance plan	In collaboration with BCAP, the Office of Energy and Planning published a gap analysis in 2011. The *New Hampshire Energy Code Compliance Roadmap* was completed in 2012 as part of the NH Energy Code Compliance project, initiated by ARRA.	
Utility involvement	The Public Utilities Commission allows the utilities to provide trainings using some of the funds derived from the Systems Benefit Charge. The state's largest utility is actively involved in supporting energy code compliance through trainings on behalf of all major utilities.	
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.	
Total		1
New Jersey		
Total		0
New Mexico		
Gap analysis/strategic compliance plan	New Mexico completed a gap analysis and a strategic compliance plan in 2011 in partnership with BCAP.	
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. New Mexico is preparing for the review of the 2012 and 2015 IECCs and, based on the adoption of the most appropriate code, support of training programs and outreach will be initiated.	
Total		1
New York		
Baseline and 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 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 the 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). The study can be found here.	
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 2012–16. 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.	

State	Compliance efforts	Score
Stakeholder advisory group	NYSERDA staff and contractors conduct regular meetings with the code enforcement, design, and construction communities. 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 dialog on ECCCNYS.	
Training/outreach	Made possible by funding through the System Benefits Charge, NYSERDA expects to launch new training and direct municipal support services in early 2014.These 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 ICC to produce a code commentary specific to New York's upcoming code changes This will be delivered to every municipal code office in the state and made available for purchase through ICC's website.	
Total		2
North Carolina		
Training/outreach	The Engineering Division of the NC Department of Insurance regularly conducts code training through various state associations and has energy conservation code training modules available on its website.	
Total		0.5
North Dakota		
Training/outreach	The state will be working with the Home Builders Association and the Building Officials Association to provide training to contractors in the next year.	
Total		0.5
Ohio		
Gap analysis/strategic compliance plan	BCAP completed an Ohio gap analysis report in 2010. The 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 of Ohio 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 the 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 passed at least one energy certification exam to earn the title of ICC Energy Code Ambassador. Code Ambassadors will provide support, mentoring, and/or customized assistance to their peers in nearby jurisdictions. Funding for this program is provided by American Electric Power Ohio and Columbia Gas of Ohio.	
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 documents continuous education, training, and outreach for Oklahoma code officials, contractors, and tradespeople.	
Total		0.5
Oregon		

State	Compliance efforts	Score
Gap analysis/strategic compliance plan	The NEEA compliance study (see below) is being used to identify areas where the Building Codes Division (BCD) can improve training to building officials and inspectors statewide. NEEA, the Oregon Home Builders Association, and the Oregon Department of Energy are working on outreach to other stakeholders with additional training.	
Baseline and updated compliance studies	NEEA recently completed its 2013 compliance study for the region. It includes recommendations to improve compliance, which Oregon is incorporating into training and process improvements. Design is underway for commercial compliance studies in the NEEA region. NEEA's study measured compliance on two scales and returned results of 91% and 96%. The previous NEEA study on compliance in Oregon was conducted in 2008.	
Utility involvement	The Oregon Public Utility Commission (PUC) allows energy savings from code compliance to be included in utility integrated resource plan energy efficiency savings. The major IOU programs (gas and electric) are operated by the Energy Trust of Oregon, and IOUs also support NEEA. PUC and governing board provide oversight to verify that programs support code compliance and work toward advancing codes.	
Stakeholder advisory group	NEEA operates a regional code collaborative, with regularly scheduled meetings and cooperative deliverables, to help align/compare codes in the region. The Oregon Department of Energy also works closely with the Pacific Coast Collaborative on codes and standards opportunities.	
Training/outreach	NEEA has partnered with the Oregon Home Builders Association for outreach to homebuilders and has created a separate partnership with the Oregon Department of Energy for outreach to builders, designers, industry, and other stakeholders. All building officials are required to be certified by the state and complete 16 hours of continuing education every three years. In addition, NEEA has developed and is presenting a modified version of the Building Codes Division energy code training.	
Total		2
Pennsylvania		
Gap analysis/strategic compliance plan	The Pennsylvania Department of Environmental Protection (PA DEP) funded the Pennsylvania gap analysis conducted by BCAP. Over 90% of Pennsylvania's 2,562 municipalities have elected to administer and enforce the Uniform Construction Code locally using their own employees or via certified third-party agencies.	
Stakeholder advisory group	PA DEP is working with various parties, including BCAP, to build a codes collaborative of stakeholders to determine best practices for codes compliance in Pennsylvania.	
Training/outreach	Code officials receive training in anticipation of passing the exams required to obtain initial certification. To augment current training opportunities, 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 to train contractors and code officials through 2015.	
Total		1
Puerto Rico		

State	Compliance efforts	Score
Training/outreach	Regularly, the Permits Office provides training and outreach programs for contractors and other professionals of the construction industry. The first edition of the new Puerto Rico Building Code was started in 2009, when the Permits Office formally established a Construction Codes Committee, composed of representatives from the construction industry, architects, engineers, and regulatory government agencies, to review and implement a transition from the existing 1997 Uniform Building Code (UBC) to the family of the International Codes® of ICC (I-Codes®).Several seminars were offered with the help of ICC to familiarize all stakeholders with the 2009 I-Codes. Three days were used for technical hearings, where proposed amendments were evaluated in order to produce a building code for Puerto Rico that took into consideration its unique geographical, climatological, social, and economic characteristics. These series of amendments to the I-Codes, together with the original 2009 code, composed the 2011 Puerto Rico Building Code.	
Total		0.5
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 and updated compliance studies	The state of Rhode Island and National Grid jointly funded residential and commercial code compliance baseline 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 be either 70% compliant with the prevailing energy code or using 30% more energy than fully code-compliant buildings. The Rhode Island Building Commission is working with National Grid and NEEP on the Code Compliance Enhancement Initiative, which has created software and web-based compliance tools in order to continually measure code compliance.	
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 and workshops and conduct technical assistance circuit riding. 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.	
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.	

State	Compliance efforts	Score
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 to 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, and so on. 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 in November 2011 completed a compliance plan providing a five-year roadmap for energy code implementation in the state.	
Training/outreach	The South Carolina Energy Office (SCEO) continues to sponsor training for code compliance. During the past year, SCEO supported training on proper duct installation and repair through the South Carolina Association of Heating and Air Conditioning Contractors (SCAHACC), as well as training in code compliance at the SC Homebuilders Association annual meeting. In addition, we collaborated with SCAHACC, the SC Homebuilders Association, and the SC Sustainability Institute to develop and offer duct and envelope tightness verifier training. Based on materials developed by Southface, the South Carolina program includes the option of in-person or online training, followed by mandatory field practice and testing for successful certification.	
Total		0.5
South Dakota		
Gap analysis/strategic compliance plan	South Dakota completed a gap analysis in collaboration with BCAP. It was published in January 2011.	
Total		0.5
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		
Gap analysis/strategic compliance plan	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, 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 to identify next steps.	
Stakeholder advisory group	The Texas Energy Code Compliance Collaborative is run by SPEER in collaboration with SECO.	

State	Compliance efforts	Score
Training/outreach	SPEER has developed a statewide Energy Code Ambassador Program. These professionals have advanced training in the energy codes and provide peer-to-peer assistance to code officials and builders in their local areas. The program is being expanded in 2014. SECO also provides several training programs around the state and has established an online training center, the Texas Energy Code Training Center: http://www.txenergycodetraining.org.	
Total		1
U.S. Virgin Islands		
Training/outreach	The Department of Planning and Natural Resources (DPNR) Division of Building Permits has hired and trained inspectors assigned exclusively to energy code compliance in each district. The Virgin Islands Energy Office and DPNR have conducted IECC code compliance training for inspectors, architects, engineers, and contractors. The most recent training courses were held in June 2013. One-on-one instruction on COMcheck and REScheck software is provided by phone, email, and in person by DPNR staff.	
Total		0.5
Utah		
Baseline and updated compliance studies	Utah participated in a compliance pilot study in 2011 using a methodology developed by PNNL. It 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. There is no specific utility commission guidance regarding utility code support.	
Training/outreach	The Office of Energy Development has signed a MoU with the Salt Lake County Planning and Development Services to provide training to contractors and code officials.	
Total		1.5
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 and updated compliance studies	The Department of Public Service (DPS) measured compliance with RBES and CBES in recent market assessments, which were completed in February 2013 and December 2012, respectively. The technical compliance rate for residential was 74% and for commercial, 88%.	
Utility involvement	Efficiency Vermont (EVT), the state's energy efficiency utility, is very active in supporting building energy codes. It maintains an Energy Code Assistance Center with a toll-free number to provide assistance with the codes. It also provides assistance in filling out the certificates. After the state updated the codes, EVT held numerous trainings for builders, architects, and realtors on the new requirements.	
Stakeholder advisory group	The state is currently working with NEEP to form a building code collaborative, which will be in place by the time the new energy codes become effective, toward the end of 2014 or early 2015.	

State	Compliance efforts	Score
Training/outreach	EVT provides trainings to builders, town officials (including zoning administrators and code officials), architects, design and construction professionals, and market partners (real estate professionals, mortgage lenders, appraisers, attorneys) on the energy code requirements to increase compliance. The outreach to realtors has been particularly successful in making sure energy code compliance certificates are in place, as they will require this when representing a buyer of a building before a transaction is completed. EVT, in partnership with DPS, has conducted several meetings for town officials, including zoning administrators and code officials, to discuss the energy code and the new requirements to obtain code compliance certificates prior to issuing certificates of occupancy.	
Total		2
Virginia		
Baseline and updated compliance studies	The Department of Housing and Community Development (DHCD) completed a compliance assessment and submitted results to DOE/PNNL in 2012.	
Training/outreach	The Division of Building and Fire Regulations within DHCD provides comprehensive training for both residential and commercial energy codes and has recently approved a voluntary certification program for code officials. Additionally, new 2012 code update training is currently underway for both commercial and residential energy requirements. At least four more on-site training sessions are scheduled for July and August 2014. After live on-site training is completed, the training will be placed on the agency's Knowledge Center and available at no cost to code officials and contractors throughout the state of Virginia. There is no cost to access the free online training.	
Total		1.5
Washington		
Gap analysis/strategic compliance plan	Washington state has developed a strategic plan for buildings, which was updated in 2014. This plan includes recommendations for sustaining and expanding training opportunities, and evaluation of code compliance.	
Baseline and updated compliance studies	A residential code compliance study was completed by NEEA in 2013. This report describes the compliance of residential new construction in Washington State with respect to the revised state energy code, the 2009 Washington State Energy Code. The study team assessed compliance using two different approaches: (1) PNNL Checklist Method and, (2) Significant Item Method. The Checklist Method analyzed how well the studied homes complied with each of the 61 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% and 97% 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.	

State	Compliance efforts	Score
Utility involvement	The region's electric utilities provide significant funding for energy code training through the regional market transformation efforts at NEEA. Through NEEA and individual energy conservation incentives provided by the utility, they provide additional funding for projects that move beyond minimum code. This includes single-family, multifamily, 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 on energy savings attributed to codes, third-party programs, and utility hookup standards.	
Stakeholder advisory group	Washington state works collaboratively with other northwestern states in the development and implementation of energy codes. The Northwest Energy Code Group organized through NEEA brings state energy office staff, code enforcement trainers, and utility staff together to identify code enforcement issues, share training strategies, and 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 website. The NW Energy Code Group and participating members have developed many code change proposals that have been adopted into the model codes, including IECC and ASHRAE 90.1, 189.1, and 62.2.	
Training/outreach	Washington state and Northwest 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 2009–12 code cycle, the Washington State University (WSU) Extension Energy program provided 215 trainings for a total of 5,164 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 Washington code. WSU also provides a detailed website with numerous training aids, a builders' field guide, and supplemental information to assist in code compliance. See http://www.energy.wsu.edu. The Northwest Energy Efficiency Council (NEEC) provides training for the commercial sections of the state energy code. For the 2009–12 code cycle, NEEC provided training to approximately 2,500 participants. NEEC also provides a detailed website with numerous training aids, compliance forms, and supplemental information to assist in code compliance.	
Total		2
West Virginia		
Gap analysis/strategic compliance plan	Compliance study completed through BCAP.	
Stakeholder advisory group	An informal partnership of stakeholders in West Virginia's built community worked together to effect the adoption of the 2009 IECC, as evidenced by a slightly later effective date for the code. Parties agreed to a later implementation date so that the WV Division of Energy (WVDOE) 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 WVDOE. Representatives of the home builders, code officials, architects, and, importantly, realtors met to determine the next steps for continuing education (CE), including CE credits for each industry, on the codes. Appraisers have since joined the effort.	

State	Compliance efforts	Score
Training/outreach	In 2014, WVDOE sponsored commercial as well as residential energy code training. In 2013, WVDOE sponsored residential energy code training to prepare the building community for the transition from the 2003 IECC to the 2009 IECC. Regional training provided an overview of the earlier code, followed up with a session on the newer code, and concluded with training focused on new HVAC requirements. In 2014, these trainings continued and included an added feature: a focus on the National Green Building Standard with instruction on building 15% more stringently than the 2009 IECC. On the commercial side, WVDOE expanded its ASHRAE training from three workshops in 2013 to four in 2014. In both years, the workshops covered the current code, ASHRAE 90.1-2007. In 2014, additional components included the need for energy-efficient designs and upgrades, how to measure efficiency, how to compare it with other buildings, how to use energy modeling to improve prediction accuracy, the value of commissioning/retro commissioning/dynamic commissioning, ASHRAE certifications, financing, and rebates and incentives. Attendees received professional development attendance certificates and those eligible received American Institute of Architects and WV state bar credit. Another series of workshops sponsored by WVDOE included Energy Efficiency in Commercial and Government Buildings, with a focus on energy basics, overview of energy systems in buildings, maintenance and troubleshooting, operational considerations, identifying recommendations, and estimating savings. Industrial Energy Efficiency Best Practices workshops included traditional WVDOE-supported topics such as process improvements and added components on energy efficiency measures for industrial facilities and an introduction to energy management.	
Total		1
Wisconsin		
Baseline and updated compliance studies	Wisconsin received funding from 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 state amendments as addressed under SPS 363).	
Training/outreach	All licensed Uniform Dwelling Code and Wisconsin commercial building inspectors are required to obtain CE credits in order to renew their license. Each late winter/early spring, the four inspector associations put on trainings, but it is not mandatory. The Department of Safety and 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 Wisconsin Focus on Energy, the Energy Center of Wisconsin, the Wisconsin Builders Association, and others.	
Total		1.5
Wyoming		
Stakeholder advisory group	Wyoming Conference of Building Officials	
Training/outreach	The Wyoming State Energy Office has ongoing seminars available.	
Total		0.5

Appendix I. Summary of Revenue Streams, Incentives, and Financing for CHP

State	Revenue streams	Incentives and grants	Financing
Alaska	—	**Renewable Energy Grant Program** is intended to provide assistance to utilities, independent power producers, local governments, and tribal governments for feasibility studies, reconnaissance studies, energy resource monitoring, and work related to the design and construction of eligible facilities. CHP is an eligible technology	—
Arizona	At least wholesale net metering	**Energy Equipment Property Tax Exemption** and **Renewable Energy Business Tax Incentives** offer tax exemptions to renewable energy and energy efficiency technologies. CHP is an eligible technology.	—
California	At least wholesale net metering and feed-in tariff	**Self-Generation Incentive Program** pays customers who produce electricity with advanced technologies, including CHP.	—
Colorado	At least wholesale net metering	—	—
Connecticut	—	**Combined Heat and Power Pilot Grant Program** provides a property tax exemption for renewable energy systems, such as CHP, and hydropower facilities that generate electricity for private residential use.	**Combined Heat and Power Pilot Loan Program** helps finance the cost of CHP equipment for energy-generating projects in development that have not yet started construction.
District of Columbia	At least wholesale net metering	**Cogeneration Personal Property Tax Credit** is a personal property tax exemption for cogeneration systems within the district.	—
Florida	At least wholesale net metering	**Solar and CHP Sales Tax Exemption** applies to solar energy equipment and hardware as well as machinery and equipment used at a fixed location for producing electrical or steam energy resulting from burning boiler fuels other than residual oil.	—
Idaho	—	—	**Renewable Energy Project Bond Program** allows independent (non-utility) developers of renewable energy projects in the state, including CHP/cogeneration, to request financing.

State	Revenue streams	Incentives and grants	Financing
Maine	At least wholesale net metering	—	—
Maryland	At least wholesale net metering	**BGE Smart Energy Savers Program** offers CHP design, installation, and production incentives to all customer classes. **Delmarva Power Combined Heat and Power Program** and **Pepco Combined Heat and Power Program** offer net system capacity payments and production incentives for CHP.	—
Massachusetts	—	**MassSave Utility Energy Efficiency Program** offers production incentives based on a three-tier system considering energy efficiency.	CHP systems that receive incentives through the **MassSave program** are also eligible for a $500,000 interest-free loan.
Minnesota	At least wholesale net metering	—	—
New Hampshire	At least wholesale net metering	—	—
New Jersey	—	**Clean Energy Solutions Large Scale CHP–Fuel Cells Program** offers grants for the installation of CHP or fuel-cell systems to commercial, industrial, and institutional entities (including nonprofits and public entities). **Cogeneration Tax Exemption** provides a sales and use tax exemption on natural gas purchases for customers using the gas to fuel on-site energy generation.	**Clean Energy Solutions Energy Efficiency Revolving Loan Fund** offers loans to commercial, institutional, and industrial entities to finance energy efficiency improvements, including CHP project costs.
New Mexico	At least wholesale net metering	—	—
New York	At least wholesale net metering	**CHP Acceleration Program** provides incentives for installing prequalified and pre-engineered CHP systems by approved CHP system vendors.	—
North Carolina	—	**Renewable Energy Tax Credit** offers a tax credit equal to 35% of the cost of eligible renewable energy, including CHP, that is constructed, purchased, or leased by a taxpayer and located in North Carolina.	—
North Dakota	At least wholesale net metering	—	—

State	Revenue streams	Incentives and grants	Financing
Ohio	—	**Energy Conversion and Thermal Efficiency Sales Tax Exemption** provides a sales and use tax exemption for personal property used in energy conversion, solid waste energy conversion, or thermal efficiency improvement facilities.	—
Oklahoma	At least wholesale net metering	—	—
Oregon	—	**Energy Incentives Program** offered by the Oregon Department of Energy provides a tax credit to competitively selected CHP projects.	
Pennsylvania	At least wholesale net metering	—	—
Rhode Island	—	**National Grid Electric's CHP Program** offers three tiers of performance rebates based on the energy efficiency of CHP units.	—
Utah	—	**Utah Alternative Energy Development Incentive** is a post-performance tax credit for 75% of new state tax revenues (including, state, corporate, sales, and withholding taxes) over the life of the project or 20 years, whichever is less. Includes CHP.	—
Vermont	At least wholesale net metering	**Investment Tax Credit** applies to installations of renewable energy equipment, including CHP, on business properties.	—
Washington	At least wholesale net metering	—	—
West Virginia	At least wholesale net metering	—	—
Wisconsin	At least wholesale net metering	—	—

Appendix J. Expanded Table of State R&D Programs

State	Major R&D programs	Score
California	The California Energy Commission's Energy Research and Development program includes the **Electric Program Investment Charge Program** and **Natural Gas Research and Development Program**. The Energy Commission's energy efficiency R&D focuses on technologies, tools, and strategies to maximize the efficiency of existing buildings and new construction, such as zero net energy buildings, and process improvements for the industrial, agriculture, and water sectors. The University of California at Davis houses the **Center for Water-Energy Efficiency** (CWEE) and the **Energy Efficiency Center** (EEC). CWEE focuses on technologies and policies that increase water efficiency. 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. UC–Berkeley's **Center for the Built Environment** focuses on energy efficiency solutions for the built environment while meeting the comfort and environmental needs of the occupants. The **Center for Energy Science and Technology Advanced Research** at UCLA includes energy efficiency as one of its four major research areas. The **Smart Grid Energy Research Center** 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** at Colorado State University contributes to energy efficiency in its 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** at the University of Colorado in 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** 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 the National Renewable Energy Laboratory (NREL) and 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** 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. The University of Connecticut's **Fraunhofer Center for Energy Innovation** (CEI) conducts research in energy production, storage, and distribution. The center focuses on developing advanced technologies related to energy storage, fuel cells, power management, and distribution. The **Connecticut Center for Advanced Technology** focuses on initiatives in several areas of energy efficiency, including advanced manufacturing technologies and strategies for improving efficiency.	1.5

State	Major R&D programs	Score
Florida	The University of Central Florida's **Florida Solar Energy Center's** 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** 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** 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. The **Clean Energy Research Center** at the 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. The **Florida Energy Systems Consortium** develops innovative energy systems that lead to alternative energy strategies, improved energy efficiencies, and enhanced economic development.	1.5
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. To date, the CARD grant program has funded over 80 R&D projects representing over $21 million in grant funds and leveraging nearly $6 million in additional matching funds. The **Center for Diesel Research at the University of Minnesota** focuses on the energy efficiency and environmental impacts of internal combustion engines. The **Center for Energy and Environment's Innovation Exchange** is a hub for researching, synthesizing, and pioneering energy efficiency solutions.	1.5
Nebraska	The **Nebraska Center for Energy** Sciences Research is a collaboration between the University of Nebraska–Lincoln and the Nebraska Public Power District. It was 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** program is a collaboration between the University of Nebraska at Omaha and the Omaha Public Power District. Past research has studied low-income, neighborhood energy action efforts; real-time energy monitoring; and commercial customer energy efficiency program adoption. The **University of Nebraska Utility Corporation** 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

State	Major R&D programs	Score
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. The **Center for Sustainable and Renewable Energy** at the State University of New York (SUNY) is a clearinghouse 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** 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 EPA, the New York State Assembly, the IOU National Grid, Syracuse University, and private donations. The **Institute for Urban Systems** at City University of New York 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** 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 photovoltaics.	1.5
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 CHP technology in the Southeast, and also operates the Database of State Incentives for Renewables and Efficiency. The **Center for Energy Research and Technology** 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

State	Major R&D programs	Score
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 Buildings 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 that was 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** 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
Pennsylvania	The **Energy Research Center** 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** at the Penn State Institutes of Energy and the Environment 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. The **Consortium for Building Energy Innovation** (CBEI) is located at the Navy Yard in Philadelphia. CBEI is comprised of 14 organizations, including major research universities, global industrial firms, and national laboratories from across the United States who collaborate to develop and demonstrate solutions for 50% energy reduction in existing buildings by 2030. CBEI is a research and demonstration center that works in close partnership with DOE's Building Technologies Office.	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 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. The **Solar Energy Lab** at the University of Wisconsin emphasizes the application of engineering concepts to energy problems, including solar heating, photovoltaics, dessicant and absorption cooling, and HVAC and air quality.	1.5

State	Major R&D programs	Score
Arizona	The **Sustainable Energy Solutions 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 **Light Works 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** 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 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** 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 the Amoco Foundation, Commonwealth Edison, the Electric Power Research Institute, People's Energy Corporation, and Nicor Incorporated. The **Illinois Sustainable Technology Center** at the University of Illinois at Urbana-Champagne promotes sustainability through resource conservation, pollution prevention, and research efforts, including energy efficiency.	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. It 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, Incorporated** is a nonprofit 501(c)(3) corporation that works in partnership with the University of Kansas's 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, one of which is 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 13 university members of the Power Systems Engineering Research Center, an organization including the Department of Energy, National Science Foundation, the Electric Power Research Institute, industry, and utilities.	1

State	Major R&D programs	Score
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 HVAC, CHP, 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** supports entrepreneurs and early-stage energy efficiency and conservation businesses seeking to transition from research and development into demonstration and ultimately commercialization.	1
Massachusetts	The **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 DOE, the University of Massachusetts, and Massachusetts electric utilities NSTAR, MECO and WMECO in partnership. The **Center for Energy Efficiency and Renewable Energy** 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 DOE grants. Massachusetts is also leveraging $4.5 million 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 demonstrate advanced lighting technology. The **Clean Energy Research Center** 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
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 also promotes the commercialization and deployment of advanced technologies, some of which are related to energy efficiency. State universities also partner with other federal agencies. **CURENT** at the University of Tennessee, Knoxville is jointly supported by the National Science Foundation and DOE. CURENT's research focuses on improvement in the transmission grid, better accommodation of renewable energy sources, full utilization of energy storage, and accommodation of responsive load.	1

State	Major R&D programs	Score
Texas	Texas A&M's **Texas Engineering Experiment Station** (TEES) includes the Energy Systems Laboratory (ESL), which is 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 researchers 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** 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
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 Center** 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 in conducting R&D activities in the tobacco regions of the Commonwealth.	1
Alabama	The University of Alabama's **Center for Advanced Vehicle Technologies** assists in the research and development of numerous transportation systems and vehicles, and has a faculty and staff of 30. Its efficiency research is primarily focused on improving powertrains as well as energy storage and fuel cells.	0.5
Alaska	The **Cold Climate Housing Research Center**, which represents 1,200 building industry organizations in Alaska and has a staff of 26, conducts applied RD&D 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.	0.5
District of Columbia	The Green Building Fund Grant Program provides funding to research projects related to green buildings, including efficiency-related measures such as urban heat islands and zero-energy homes.	0.5
Hawaii	The **Hawaii Natural Energy Institute** at the University of Hawaii 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** 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** 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
Maine	The **Maine Technology Institute** (MTI) invests in research and development. MTI defines its areas of focus as clusters, one of which is energy and the environment and explicitly includes energy efficiency technologies.	0.5

State	Major R&D programs	Score
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% rebate of the total research costs. The **Energy Institute** at Mississippi State University works to develop new technologies to promote energy efficiency through CHP 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 the 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
New Jersey	The New Jersey Commission on Science and Technology administers the **Edison Innovation Clean Energy Fund** through an MoU 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.	0.5
Ohio	The **Center for Energy, Sustainability, and the Environment** at Ohio State University conducts research in efficient energy infrastructure systems (e.g., power grid and transportation networks), as well as "systems of energy systems" (e.g., smart microgrids and markets).	0.5
Puerto Rico	The **Puerto Rico Energy Center** works to advance Puerto Rico's energy efficiency and clean energy use through research, technology transfer, education, and demonstration. The center is operated by the University of Turabo with active participation by faculty members and researchers from different disciplines and universities.	0.5
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, Incorporated**, to develop an electric bus charged by wireless energy transfer between the roadway and the vehicle. The university also operates the Utah House, an energy and water efficiency demonstration facility.	0.5
Vermont	The **University of Vermont Smart Grid Research Center** conducts research on the technological, human behavior, and public policy implications of smart-grid technology, including its use to increase energy efficiency.	0.5
Washington	The **Northwest Building Energy Technology Hub** 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