THE 2011 STATE ENERGY EFFICIENCY SCORECARD

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EXECUTIVE SUMMARY

Introduction

In 2011, energy efficiency continued to build momentum in the states despite a sluggish economic recovery, a partisan political climate, and the failure of Congress to develop a comprehensive energy policy. Governors, state legislators, regulators, and citizens are increasingly recognizing that energy efficiency—the kilowatt-hours and gallons of gasoline we *don't* use as a result of improved technologies and practices—is the cheapest, cleanest, and quickest energy resource to deploy. Indeed, energy efficiency is a key solution to our economic, energy, and environmental challenges. Fully harnessing America's untapped, abundant energy efficiency resource will not only save consumers and businesses money, but will also unleash technological innovation and new business opportunities that create and sustain jobs. As they have over the past decades, ***states continue to provide the leadership needed to forge an energy-efficient economy, which reduces energy costs, spurs job growth, and benefits the environment.***

In the fifth edition of ACEEE's *State Energy Efficiency Scorecard*, we present a comprehensive ranking of the states based on an array of metrics that capture best practices and recognize leadership in energy efficiency policy and program implementation. The *Scorecard* benchmarks progress and provides a roadmap for states to advance energy efficiency in the residential, commercial, industrial, and transportation sectors. A new, diverse set of states has followed a group of leading states by adopting significant energy efficiency policies, which will lead to innovative and effective programs. Nonetheless, the tremendous potential remaining for energy efficiency savings in all of the states should motivate decision-makers to advance energy efficiency. Cost-effective investment in energy efficiency now will be critical for the success of local, state, and national economies in the future.

Key Findings

- Facing uncertain economic times, states are continuing to use energy efficiency as a key strategy to generate cost-savings, promote technological innovation, and stimulate growth. Energy efficiency is also a pragmatic, bipartisan solution that political leaders from both sides of the aisle have supported over the past year.
- Earning the #1 ranking, Massachusetts has overtaken California, which had placed atop the rankings the last four years. Central to Massachusetts' success is the continued implementation of the 2008 Green Communities Act, which laid the foundation for greater investment in energy efficiency programs.
- This year's most improved states include Michigan, Illinois, Nebraska, Tennessee, Alabama, and Maryland. Michigan, Illinois, and Maryland have significantly increased utility-sector energy efficiency efforts in order to meet energy savings targets established in Energy Efficiency Resource Standards (EERS) passed in 2008. Illinois and Maryland also recently adopted energy-efficient transportation policies and Michigan has become a leader in the research and development of energy-efficient technologies. Tennessee, Nebraska, and Alabama saw improvements across categories, particularly in the adoption of stringent building codes.
- Not far behind Massachusetts and California, a group of states including New York, Vermont, Oregon, Washington, Connecticut, Minnesota, and Rhode Island remain in the top ten and continue to lead the nation in energy efficiency policy and program implementation across all economic sectors.
- Total budgets for electricity efficiency programs increased to $4.5 billion in 2010, up from $3.4 billion in 2009. Combined with natural gas program budgets of about $1 billion, total energy efficiency budgets in 2010 equal about 5.5 billion dollars (see Figure ES-2). Given the increasing regulatory commitments to energy efficiency, this growth will likely continue over the next decade.
- Twenty-four states have adopted Energy Efficiency Resource Standards, which set long-term energy savings targets and drives utility-sector investments in energy efficiency programs. States that adopted EERS policies in 2007 and 2008 are realizing significant energy savings and moving ahead in the *Scorecard* rankings.

- States continue to improve policies to reduce financial, technical, and regulatory barriers to adoption and deployment of combined heat and power (CHP) systems, which generate electricity and thermal energy in an integrated system. Tremendous potential remains for CHP, particularly in states with heavy industrial and manufacturing bases.
- Twenty-nine states have either adopted or have made significant progress toward the adoption of the latest energy-saving building codes for homes and commercial properties — up from twenty in 2010 and ten in 2009.
- A group of leading states remains ahead of the curve in adopting policies to reduce vehicle miles traveled and promote the purchase and manufacture of efficient vehicles. A major gap exists, however, as over half the states have minimal or no policies to encourage efficiency in the transportation sector.

Methodology

This report provides a comprehensive assessment of policy and programs that improve energy efficiency in our homes, businesses, industry, and transportation sectors. The *2011 Scorecard* examines six state energy efficiency policy areas and presents these results in six chapters (1) utility and public benefits programs and policies; (2) transportation policies; (3) building energy codes; (4) combined heat and power; (5) state government initiatives; and (6) appliance efficiency standards. States can earn up to 50 possible points in these six policy areas combined, with the maximum possible points in each area weighted by the magnitude of its potential energy savings impact.

The base year for policy assessment in the *2011 Scorecard* varies by the policy area examined. Most scores are based on policies and programs in place as of September 2011. In some cases, however, we can only score states using the most recent years for which data is available from all states. For example, Chapter 1 evaluates utility-sector energy efficiency based on policies in place as of September 2011, program budgets for 2010, and program energy savings performance in 2009.

To verify the accuracy and comprehensiveness of the policy information and data on which we score the states, we directly reached out to state-level stakeholders whose on-the-ground expertise is invaluable to the accuracy of our *Scorecard*. Officials at state energy offices and public utility commissions responded to initial policy and data requests, reviewed the draft report, and checked the material on the ACEEE State Energy Policy Database on our Web site, which houses more detailed policy references and information upon which we score the states.[1] Regional nonprofits and national organizations also contributed to the review process.

Summary of Rankings

Figure ES-1 shows the results of the state *Scorecard* rankings and classifies the states and the District of Columbia into five bins according to their ranks. Table ES-1 shows scores for each of the six policy areas, overall rankings, total scores out of a maximum possible 50 points, and change in a state's rank compared to last year's report.

The top ten states this year, shown in Table ES-2, score at least 29.5 points out of the possible 50 points, with California and Massachusetts taking the top two spots with 45.5 and 44 points, respectively. The next tier of ten states follows closely behind, scoring between 24.5 and 27 points. The third tier of states scores at least 18.5 points and the fourth tier scores more than 10 points, while states in the lowest tier score 10 points or less.

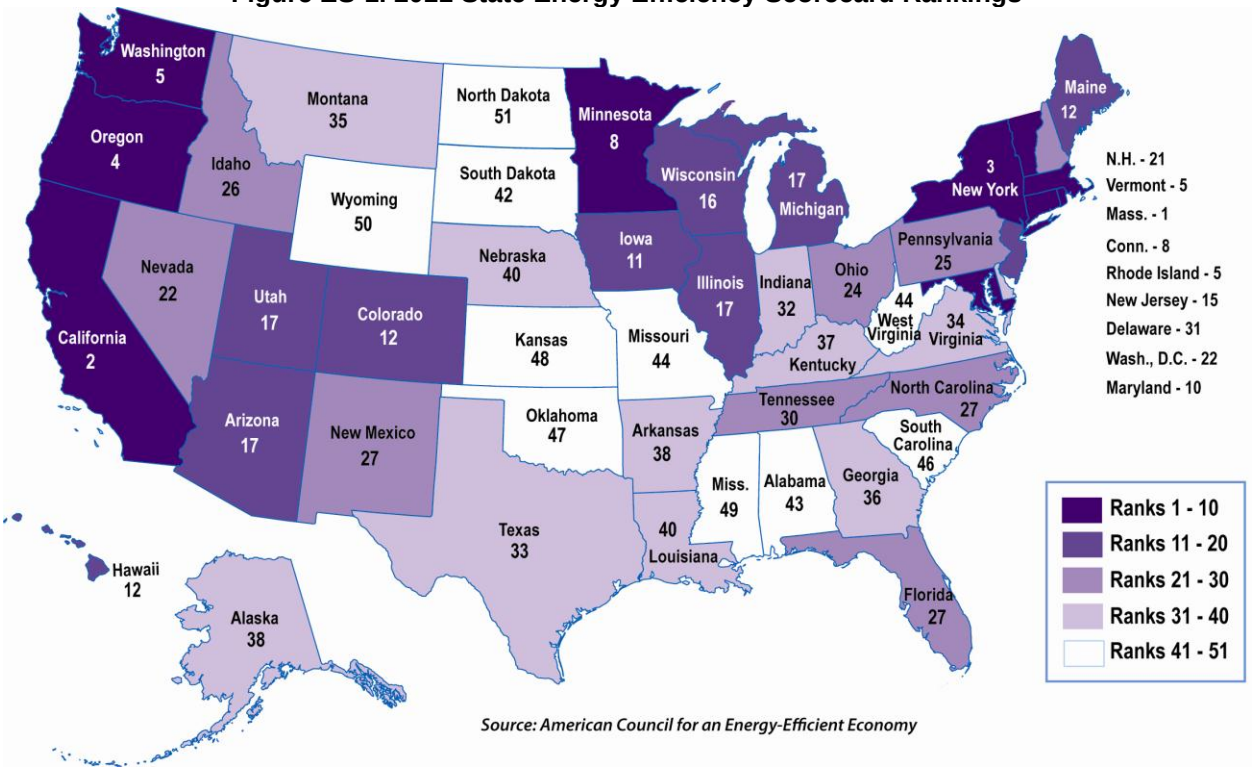
This year's "top ten" states, based on their combined scores, are listed in Table ES-2, along with the "top ten" states from last year's *Scorecard*. These states lead the nation in encouraging their citizens to improve efficiency in homes, businesses, industry, and transportation systems. Massachusetts ranks first

[1] See www.aceee.org/sector/state-policy.

over California, which had placed first in our previous four *Scorecards*. New York, Oregon, Vermont, Washington, Rhode Island, Connecticut, Minnesota, and Maryland round out the top ten this year. While the 2011 top ten are mostly the same as in the *2010 Scorecard*, Maryland has reached the first tier of states for the first time.

Although we list individual state rankings, the variation among states' energy efficiency policies and programs is better measured using tiers of ten ranks rather than by the individual rankings. For example, the difference among states listed in the "top ten" is much less significant than the difference between the tier of top ten and the second or third tier. Figure ES-1 and Table ES-1 sort the state rankings in five tiers, which is the best way for readers to interpret the results of the *2011 Scorecard*. The last column shows the state's change in ranking compared to the *2010 Scorecard*. Readers should note an important caveat: changes in state rankings are due to *both* changes in the scoring methodology as well as changes in state efficiency programs and policies.

Figure ES-1. 2011 State Energy Efficiency Scorecard Rankings



Notes: Several states have the same score and tie for the same ranking, including 5, 8, 12, 17, 22, 27, 38, and 44. We do not score the U.S. territories due to lack of data, though hope to include them in future rankings.

Table ES-1. Summary of Overall State Scoring on Energy Efficiency

Rank	State	Utility and Public Benefits Fund Efficiency Programs and Policies Score	Transportation Score	Building Energy Code Score	Combined Heat and Power Score	State Government Initiatives Score	Appliance Efficiency Standards Score	Total Score	Change in Rank from 2010	Change in Score from 2010
Maximum Possible Points:		*20*	*9*	*7*	*5*	*7*	*2*	*50*		
1	Massachusetts	18.5	7	7	5	7	1	45.5	1	3
2	California	17.5	8	7	4	5.5	2	44	-1	-1.5
3	New York	15	6	6	4	6.5	0.5	38	1	3.5
4	Oregon	13.5	6	7	4	6.5	0.5	37.5	-1	0.5
*5	Vermont	19	4	5	3	3	0	34	0	1
*5	Washington	13.5	6	7	4	3	0.5	34	1	2
*5	Rhode Island	18.5	5	5	3	2	0.5	34	2	5
*8	Minnesota	18	2	4	3	6	0	33	0	5
*8	Connecticut	12	6	5.5	5	3.5	1	33	0	5
↑10	Maryland	9.5	7	5.5	4	4	0.5	30.5	6	6.5
11	Iowa	14	1	5	2	5	0	27	1	2.5
*12	Maine	10.5	4	4.5	5	2.5	0	26.5	-2	-0.5
*12	Hawaii	12	3	5	3	3.5	0	26.5	0	2
*12	Colorado	11	2	3.5	4	6	0	26.5	7	4.5
15	New Jersey	8.5	5	4.5	4	3.5	0	25.5	-3	1
16	Wisconsin	11.5	1	5	4	3.5	0	25	-5	-1
*17	Utah	12	1	5.5	3	3	0	24.5	-5	0
↑*17	Illinois	9	3	5	4	3.5	0	24.5	8	6
↑*17	Michigan	10	2	4.5	3	5	0	24.5	10	7
*17	Arizona	11.5	4	3	3	2.5	0.5	24.5	1	1.5
21	New Hampshire	10.5	0	5.5	3	4.5	0.5	24	1	2.5
*22	Nevada	11.5	0	5	3	1.5	1.5	22.5	-3	0.5
*22	District of Columbia	6	4	5.5	4	2.5	0.5	22.5	-3	0.5
24	Ohio	8.5	0	4	5	4.5	0	22	3	4.5
25	Pennsylvania	4	4	5	4	4	0	21	-9	-3
26	Idaho	9	0	6	2	3	0	20	0	2
*27	Florida	3.5	5	5.5	2	3	0	19	3	2
*27	North Carolina	4.5	0	5	4	5.5	0	19	-3	-1
*27	New Mexico	5	2	4.5	4	3.5	0	19	-5	-2.5
↑30	Tennessee	2	4	4	3	5.5	0	18.5	5	7.5
31	Delaware	2.5	3	4.5	3	4.5	0	17.5	-4	0
32	Indiana	6.5	0	4	3	3.5	0	17	-1	0.5
33	Texas	3	0	4.5	4	4	0	15.5	-1	1
34	Virginia	2	1	5	3	3	0	14	0	2.5
35	Montana	4.5	0	5.5	1	2.5	0	13.5	-2	-0.5
36	Georgia	1.5	2	6.5	0	2.5	0.5	13	1	3
37	Kentucky	3.5	0	4.5	1	3	0	12	-1	1.5
*38	Alaska	0	1	2	2	6	0	11	-1	1
*38	Arkansas	5.5	0	2.5	1	2	0	11	3	3.5
↑40	Nebraska	1.5	0	5	1	2.5	0	10	7	6

Rank	State	Utility and Public Benefits Fund Efficiency Programs and Policies Score	Transportation Score	Building Energy Code Score	Combined Heat and Power Score	State Government Initiatives Score	Appliance Efficiency Standards Score	Total Score	Change in Rank from 2010	Change in Score from 2010
40	Louisiana	2.5	1	4	0	2.5	0	10	2	3
42	South Dakota	4.5	0	0	3	2	0	9.5	-3	0
↑43	Alabama	2.5	0	4.5	0	2	0	9	6	6
*44	Missouri	2.5	0	2	1	3	0	8.5	-1	2.5
*44	West Virginia	0	1	3	2	2.5	0	8.5	-1	2.5
46	South Carolina	1.5	0	3	1	2.5	0	8	-6	-0.5
47	Oklahoma	2.5	1	1.5	0	1.5	0	6.5	-4	0.5
48	Kansas	1	0	1.5	1	2	0	5.5	-2	0.5
49	Mississippi	0.5	0	0	1	2.5	0	4	1	2
50	Wyoming	2	0	0	0	1.5	0	3.5	-2	0
51	North Dakota	0	1	0	1	0.5	0	2.5	0	1

Notes: ↑ denotes "most improved" states. *States with the same score tie for the same rank.

Table ES-2. Top Ten States for the 2011 and 2010 *Scorecards*

2011 Edition		2010 Edition	
1	Massachusetts	1	California
2	California	2	Massachusetts
3	New York	3	Oregon
4	Oregon	4	New York
5 (tie)	Vermont	5	Vermont
5 (tie)	Washington	6	Washington
5 (tie)	Rhode Island	7	Rhode Island
8 (tie)	Minnesota	8 (tie)	Connecticut
8 (tie)	Connecticut	8 (tie)	Minnesota
10	Maryland	10	Maine

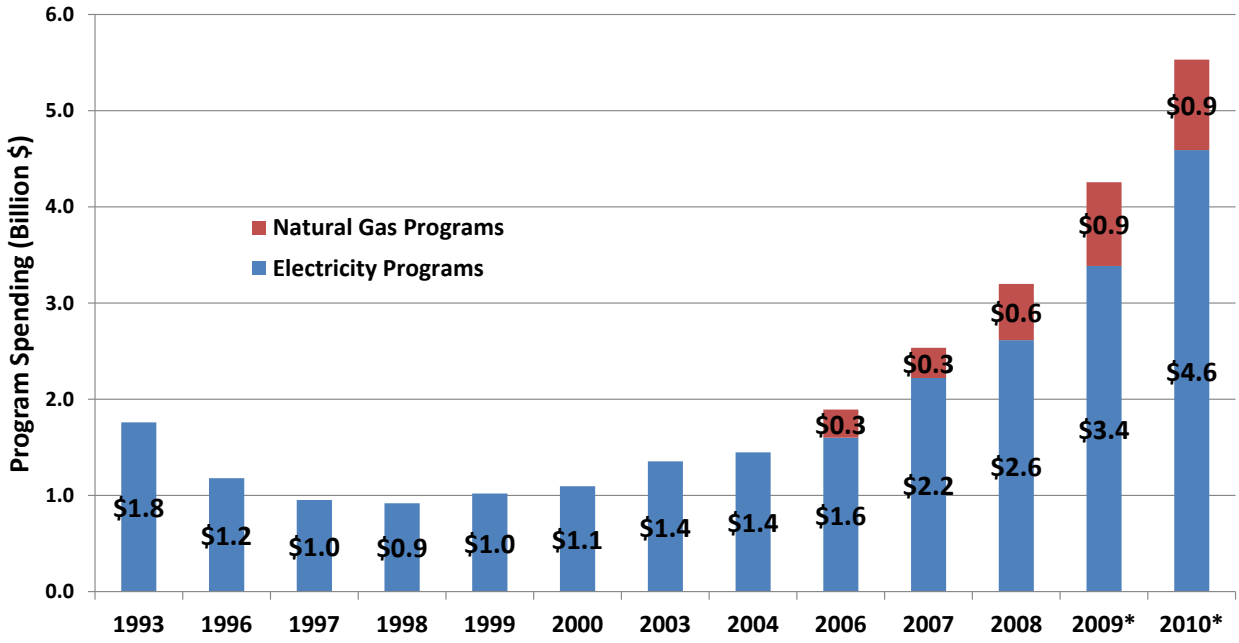
Major Recent Developments

States continue to encourage investments in energy-efficient technologies and practices in homes and businesses and on the road through policies and programs that save energy consumers money. Nationwide, states budgeted $5.5 billion for ratepayer-funded electricity and natural gas efficiency programs in 2010, up from expenditures of $4.3 billion in 2009 (see Figure ES-2). Utility-sector spending on energy efficiency has increased annually by an average amount of $900 million since 2006. Many states have entered a critical phase in energy-efficiency program and policy implementation. With foundational policies such as Energy Efficiency Resource Standards in place, states like Ohio, Illinois, and Michigan have ramped up energy efficiency efforts significantly over the past year to meet statewide energy savings goals. While the action in the middle-ranking states is encouraging, the highest-ranking states such as Vermont and Massachusetts continue to lead with innovative and aggressive programs and policies to save energy across economic sectors. The leading states will continue to reap the benefits of becoming first-adopters of energy efficiency technologies, cementing their market position as hubs for technological innovation and deployment in the energy efficiency field, thereby creating jobs and economic growth for communities and the state.

While the economy lumbered along in 2011, energy efficiency remains a growth sector that attracts investment and creates jobs. In the states that set up the proper regulatory environment and invested in energy efficiency programs, the results are apparent. New businesses are sprouting up to provide energy efficiency services, new factories are manufacturing energy-efficient technologies for buildings and vehicles, and existing businesses have discovered new markets to break into. State economies enjoy the ripple effects of energy efficiency efforts; as consumers and businesses save on energy costs, they can spend elsewhere in local economies on goods and services that produce more widespread economic benefits than spending on energy bills. [2] In a year of continued economic adversity, energy efficiency offered businesses and consumers opportunities to save and grow.

This year has been politically divisive, but amid the acrimonious debates over state budget deficits, state government policymakers from both sides of the aisle pushed for energy efficiency in homes, businesses, and their own state government facilities. An energy efficiency bill sponsored by Republican legislators in Colorado was signed by a Republican governor.[3] A Republican-sponsored bill to reduce oil consumption by 50% was enacted in Maine, where Republicans control both houses of the legislature as well as the Governor's office.[4] Major energy efficiency legislation was enacted in both traditionally Republican states (Texas) and Democratic states (New York).[5] State regulators in Arkansas, Rhode Island, and Arizona worked with utilities and adopted significant energy efficiency regulations. Despite significant progress, some states have slowed or stepped backward in the race to save energy. New Jersey and Wisconsin have both diminished investments in utility-sector energy efficiency and Arizona is considering a law that will reduce transportation efficiency in the state.

Figure ES-2. State-Level Energy Efficiency Program Spending or Budgets by Year, 1993–2010



*All values actual program spending (EIA Form 861) except for 2009 and 2010, which are budgets (CEE Annual Industry Reports).

Notes: Includes ratepayer-funded programs. Natural gas efficiency program spending is not available for 1993–2004.

Sources: Nadel et al. (2000); York and Kushler (2002), (2005); Eldridge et al. (2008 and 2009)

[2] For more on the relationship between energy efficiency and economic growth, investment, and job creation, see Ehrhardt-Martinez and Laitner (2008), Neubauer et al. (2011), McKinsey & Company (2009), Hendricks et al. (2010), and Muro et al. (2011).

[3] CO House Bill 1160

[4] Maine LD 553

[5] TX Senate Bill 1125 and HB 51; New York Program Bill 21 (Power NY Act of 2011)

"Most Improved" States

This year's most improved states compared to last year's *Scorecard* include Michigan, Maryland, Illinois, Tennessee, Alabama, and Nebraska (see Table ES-3). Michigan, Illinois, and Maryland are reaping the rewards from Energy Efficiency Resource Standards passed in 2008, which requires the states' utilities and governments to provide portfolios of energy efficiency programs sufficient to meet a specific energy savings target that ramps up over time. Each state increased ratepayer spending on utility-sector energy efficiency programs from negligible levels in 2008 to substantial levels in 2010. Energy savings reflect the increased funding levels in these states, increasing from savings equal to around 0% of retail sales to 0.4% in 2009, which is roughly equivalent to the annual electricity use of 60,000 Illinois households.

Aside from utility-sector energy efficiency, each of these states has made significant strides in other energy efficiency areas. Tennessee, Illinois, and Maryland recently began offering financial incentives for high-efficiency vehicles. Michigan has undertaken significant efforts to retool its manufacturing industry to pursue clean energy technology development. A major piece of this effort is the research, development, and demonstration of energy efficiency technologies. Tennessee, Nebraska, and Alabama passed into law major upgrades to residential and commercial building energy codes in 2011, which will make homes and businesses more comfortable and energy-efficient. Nebraska also continues to be a national leader in the implementation of state government-administered financing programs with the Dollar and Energy Savings Loan Program, which provides a wide range of customer classes with low-interest loans to make energy efficiency upgrades.

Table ES-3. Most Improved States since 2010 *Scorecard*

State	2011 Rank	2010 Rank	2011 Total Score	2010 Total Score
Michigan	17	27	24.5	17.5
Illinois	17	25	24.5	18.5
Nebraska	40	47	10	4
Alabama	43	49	9	3
Maryland	10	16	29.5	24
Tennessee	30	35	18.5	11

Energy Efficiency Performance Metrics by Humboldt State University and the Natural Resources Defense Council (NRDC)

This is the third year that we include in the *Scorecard* a chapter prepared by Humboldt State University and NRDC. Chapter 7 presents and discusses a methodology for an aggregate, state-level metric of energy consumption intensity (ECI) in the residential sector and provides summary results. Whereas the majority of the *Scorecard* tracks policy and program actions and results, the methodology in Chapter 7 identifies changes in actual state energy consumption (i.e., energy consumption per capita) after adjusting for changes due to year-to-year variations in weather.

This research confirms that it is possible to track trends in state energy consumption intensity, even with the imperfect data sets that are currently available. With improvements in the data collection process, the approach could be further strengthened into a powerful tool for evaluating states' progress in reducing energy consumption. The findings from this chapter are not factored into the overall rankings of this Scorecard, but serve as an exploratory exercise in measuring energy consumption trends as a means to understanding energy efficiency.

Conclusion

Energy efficiency is America's abundant, untapped energy resource and the states continue to press forward to reap its economic and environmental benefits. In 2011, the positive trends for state-level energy efficiency emerge clearer than ever with improvements in utility-sector investment and

performance, comprehensive transportation policies, building energy codes, combined heat and power, and state government energy efficiency initiatives. Given the tremendous amount of activity happening in the states, it is critical to recognize best practices and leadership, both to encourage other states to follow and to lay the groundwork for strong federal policy in the future. This state energy efficiency *Scorecard* documents and benchmarks state best practices, recognizes leadership, and provides a roadmap for other states to follow in paving a path toward an energy-efficient economy.

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INTRODUCTION

In a period of historic economic distress and uncertainty, energy efficiency shines brightly as a solution for saving money, driving investment, and creating jobs. Reaping the benefits of an energy-efficient economy, states from coast to coast are moving forward with the implementation of innovative and impactful energy efficiency policies and programs. This report presents a comprehensive analysis of the program and policy environment supporting energy efficiency at the state level. The ranking format of the *State Energy Efficiency Scorecard* allows us to document best practices, recognize leadership, and provide a roadmap for other states to follow. An annual publication, the *Scorecard* serves as a benchmark for state efforts on energy efficiency policies and programs each year, encouraging states to continue strengthening efficiency commitments as a pragmatic and effective strategy for economic growth and environmental protection.

Building on prior reports that focused on utility spending and savings on energy efficiency programs in each state, ACEEE released *The State Energy Efficiency Scorecard for 2006* (Eldridge et al. 2007) in 2007, providing a more comprehensive approach to scoring and ranking states on energy efficiency policies. Due to the broad interest in the 2007 report and the continued demand for a state-by-state comparison on energy efficiency, we have continued to update the report on an annual basis and present this report as its fifth edition.[6] In the report, we first discuss the methodology for scoring states and some caveats. We then present the detailed results in six chapters, one for each policy area that we review:

1. Utility and Public Benefits Programs and Policies
2. Transportation Policies
3. Building Energy Codes
4. Combined Heat and Power
5. State Government Initiatives
6. Appliance and Equipment Efficiency Standards

The report also includes a chapter prepared by Humboldt State University and the Natural Resources Defense Council on state energy consumption trends and efficiency performance metrics. The findings of that section are not incorporated into the overall scoring; however, they serve as an important complement to our policy *Scorecard*.

Finally, we present a discussion of the *Scorecard* results, which further assists readers with interpreting the rankings and methodology. The chapter highlights the most improved states and other trends in state-level energy efficiency revealed by the rankings. The chapter also focuses on further areas of research and potential changes to the *Scorecard* in 2012.

METHODOLOGY

Scoring

To score states on energy efficiency, we identified six overall policy areas pursued by states to encourage energy efficiency, listed in Table 1 below. In general, the policies and programs scored in this report have one or more of the following objectives:

- Directly reduce energy consumption
- Provide funding for energy efficiency programs
- Set long-term commitments to efficiency
- Reduce market, regulatory, and information barriers to energy efficiency

[6] The National Renewable Energy Laboratory publishes an annual *State of the States* report, which includes rankings of all states based on renewable energy policy and performance (Doris et al. 2009). These reports serve as an excellent complement to our energy efficiency *Scorecard*.

- Establish mandatory performance codes and standards
- Accelerate the adoption of the most energy-efficient technologies

Understanding that every state has different policy and regulatory situations, we have made our best effort to ensure our metrics are flexible enough to capture the full range of policy and program options states employ. We do not report scores for the U.S. territories because the data is unavailable, though we hope to include these in future editions of the *Scorecard*.

Table 1 below shows the six policy categories and the scoring system that assigns a maximum score for each policy category, weighting policy categories based on approximate energy savings impacts (i.e., state policies that are likely to result in the highest energy savings have the highest maximum score). The weighting of policy areas is mostly consistent with last year's scoring, and was informed by ACEEE staff, outside expert judgment, and state and regional studies that have evaluated the relative energy savings impacts from state-level policies (SWEEP 2007; Neubauer et al. 2009b and 2011; Molina et al. 2010 and 2011). For example, the energy efficiency potential studies we reviewed found that utility and public benefits programs could contribute about 40% of the total energy savings potential. Building energy codes, on average, could contribute about 15% of the total savings potential, and improved CHP policies about 10%. We thus attribute 40% of 50 possible points to utility and public benefits program and policy metrics, or 20 points. Similarly, we attribute 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, then reviewed by expert judgment and adjusted according to review.

Table 1. Overall Methodology: Maximum Scores for each Policy Category

Policy	Maximum Score
1. Utility and Public Benefits Programs and Policies	**20**
Electricity Efficiency Program Budgets	5
Natural Gas Efficiency Program Budgets	3
Annual Savings from Electricity Efficiency Programs	5
Targets (Energy Efficiency Resource Standards)	4
Performance Incentives/Alternative Regulatory Business Models	3
2. Transportation Policies	**9**
3. Building Energy Codes	**7**
Level of Stringency	5
Enforcement/Compliance	2
4. Combined Heat and Power	**5**
5. State Government Initiatives	**7**
Financial and Information Incentives	3
Lead by Example in State Facilities and Fleets	2
Research, Development, and Demonstration	2
6. Appliance and Equipment Efficiency Standards	**2**
Maximum Total Score	**50**

Within each policy category, we then developed a scoring methodology based on a subset of criteria and assigned a score for each state based on extensive review and communication with experts in the field. See each policy chapter for a discussion of its methodology. The only change to the overall methodology in the 2011 update is that appliance and equipment efficiency standards earns 2 points rather than 3 and the maximum score in the transportation policies section increased from 8 to 9. Methodology changes within each policy area are discussed in each chapter.

Changes in Scoring

Some minor changes in scoring methodology compared to last year may affect some of the overall rankings. Full explanations for the methodology changes are presented within the chapters. We revised the Utility and Public Benefits Programs and Policies chapter methodology for scoring performance incentives and alternative regulatory business models for utilities to better capture the wide range of strategies undertaken by states. We also refined our scoring for Energy Efficiency Resource Standards to better reflect the impact of cost caps and exit ramps on policy success.

In the Transportation chapter, we placed greater emphasis on policies that integrate land use and transportation planning. Sound land use planning is vital in order to stem growth in vehicle miles travelled in the United States. Because energy-efficient transportation is inherently tied to the integration of transportation and land use policies, we awarded points for states that simultaneously address land use and transportation considerations in planning processes. We also awarded states a point for the adoption of complete streets policies, which focus on the interconnectivity of streets and target safe, easy access to roads by all pedestrians, bicyclists, motorists, and public transportation users. We reduced the appliance standards metric from three to two points and increased the transportation score from eight to nine points.

In the Building Energy Codes chapter, we amended the methodology so that states earning the top score for code stringency exceed 2009 IECC, ASHRAE 90.1-2007, or equivalent standards. In the 2009 and 2010 *Scorecard* reports we allotted the maximum code stringency score for states meeting these standards, but this year around twenty states were receiving maximum scores for building code stringency. Given that a number of states now go beyond 2009 IECC and equivalents, the new methodology reflects the efforts of states to go above and beyond stringent codes and adopt standards that will result in the construction of exceptionally efficient and comfortable buildings.

We have also slightly changed the scoring methodology in the Building Energy Codes chapter to award credit for states without statewide mandatory building energy codes for various levels of adoptions by major jurisdictions. Many "home rule" states, such as Colorado, Missouri, and Oklahoma, do not have mandatory statewide codes and, instead, adopt and enforce building energy codes at the local level. Some of these jurisdictions are major urban areas that have adopted the American Recovery and Reinvestment Act (ARRA) codes and should be given credit for their efforts.

In the State Government Initiatives chapter, we have included a new metric measuring state government policies and programs enabling the use of energy savings performance contracts (ESPCs), which allow states to enter into a performance-based agreement with an Energy Service Company (ESCOs). The contract allows the state to pay the ESCO for its services with money saved from installed energy efficiency measures.[7]

State Feedback Methodology

We continued to improve our outreach to state-level stakeholders to verify the accuracy and comprehensiveness of the policy information on which we score the states. This year we reached out to every state utility commission to confirm spending and savings data for ratepayer funded programs presented in Chapter 1. State energy officials were given the opportunity to review the material concurrently on the ACEEE State Energy Policy Database[8] on our Web site and in the draft *2011 State Energy Efficiency Scorecard* report. Regional nonprofits and other state-level organizations also contributed to the review process.

[7] For a full discussion of ESPCs and the ESCO market, see Satchwell et al. (2010).
[8] The State Energy Efficiency Policy Database houses most of the policy and program information presented in the *Scorecard.* For detailed understanding of the policies we reference for this report, visit www.aceee.org/energy/state.

Data Caveats

The *Scorecard* reflects state-level energy efficiency policy environments as well as the performance of states implementing energy efficiency programs. Readers should note that the energy efficiency initiatives implemented by actors at the federal and local level as well as in the private sector are not included. Regions, counties, and municipalities have become very active in energy efficiency program development, a positive development that should reinforce the energy efficiency efforts taking place at the state level.[9] Additionally, private sector investment in efficient technologies outside the utility sector is not covered in the *Scorecard.* While utility and public programs are critical to leverage private capital, an independent metric measuring private sector investment would involve layers of complexity far beyond the scope of this report.[10]

"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." The conversion of spending data, energy savings data, and policy adoption metrics across six policy areas into one state energy efficiency score has clear limitations. Performance metrics are confined mostly to the electric efficiency. Due to data lags, these performance metrics reflect activity in 2010 rather than 2011. Policy information for the *Scorecard* is accurate as of September 2011. We continue to search for ways to gauge actual performance and implementation rather than scoring on "best practice" policies. Gathering comprehensive data for all states on the actual energy saved or funds spent on energy efficiency technologies across public and private sectors is the primary challenge going forward.

In lieu of scoring energy efficiency policy areas on reported savings or spending data attributable to a particular policy action, we have developed "best practice" metrics to score the states. Policies considered best practices will result in the greatest amount of cost-effective energy and cost savings. For example, *potential* energy savings from building energy codes and appliance efficiency have been documented, although *actual* savings from these policies are rarely evaluated. Therefore, we must rely on "best practice" metrics for building energy codes. For building energy codes, we rank states according to the level of stringency of their residential and commercial codes. Understanding that policies are only effective if they are implemented properly, we have adjusted our scoring metrics to reflect actual policy implementation for numerous policy areas. We afford states points for building code compliance, for example, to underscore the importance of enforcement. Full discussions of the policy and performance metrics used can be read in each chapter.

How to Interpret the Results

Although we provide individual state scores and rankings, we note that the difference between rankings is most significant in "bins" of ten or fifteen, rather than differences between individual rankings. As we describe above, despite intensive data collection and interviews, the methods underpinning *Scorecard* are not an exact science. The tiers of ten, as presented in Figure ES-1, are therefore the best way to interpret the results of the *Scorecard.*[11]

[9] For more information on local energy efficiency policy, visit http://www.aceee.org/sector/local-policy

[10] The *Scorecard* also does not provide scores for the growing array of quasi-governmental energy efficiency financing programs, such as on-bill financing and Property Assessed Clean Energy (PACE). In the final chapter we discuss our intentions to research the area of energy efficiency finance further for future iterations of the *Scorecard*.

[11] The fourth tier of states includes eleven states as the inclusion of the District of Columbia makes our count 51.

CHAPTER 1: UTILITY AND PUBLIC BENEFITS PROGRAMS AND POLICIES

Authors: Michael Sciortino, Seth Nowak, and Sara Hayes

Background

The utility sector is critical to the implementation of energy-efficient technologies and practices. Electric and natural gas utilities as well as statewide independent program administrators administer and deliver a substantial share of U.S. electric and natural gas efficiency programs.[12] Utility ratepayers fund these programs, either through utility cost recovery or statewide "public benefits funds." Driven by effective regulation from state utility commissions, utilities and third-party program administrators in some states have been delivering energy efficiency programs for decades, and offer various efficiency services for residential, commercial, industrial, and low-income customers. Almost every state implements utility-sector energy efficiency programs today. Energy efficiency programs include a variety of financial incentives such as rebates and loans, technical services such as audits and retrofits, or broad scale education campaigns on the benefits of energy efficiency improvements.

In this chapter, we review and rank the states based on metrics that measure states' performance implementing utility-sector efficiency programs as well as enabling policies that provide a measure of states' present and future commitment to energy efficiency. The five subsets of scoring in this chapter include:

- Electricity Program Budgets for 2010
- Natural Gas Program Budgets for 2010
- Incremental Electricity Program Savings in 2009
- Energy Savings Targets, i.e., Energy Efficiency Resource Standards (EERS)
- Performance Incentives and Alternative Regulatory Business Models

Methodology

Combined, a state can earn up to 20 points in this category, or 40% of the total possible 50 points. Among efficiency programs, studies suggest that electric programs typically achieve three times as much primary energy savings as natural gas programs (Eldridge et al. 2009; SWEEP 2007). We thus allocate 10 points of this category to electric program performance metrics (annual budgets and savings data) and 3 points to natural gas program performance metrics (annual budgets).[13] Using baseline data from the Consortium for Energy Efficiency and the Energy Information Administration, we report 2010 program budgets for electricity and natural gas programs and 2009 electricity savings data (CEE 2010 and EIA 2011). We supplemented these datasets with additional research and information requests to state utility commissions. While we use EIA and CEE data, the analysis is solely a product of ACEEE.[14]

Supporting policies are also critical to leveraging energy efficiency funding and encouraging savings over the near and long term. In this chapter we credit states with Energy Efficiency Resource Standards (EERS—mandatory energy savings targets) and regulatory mechanisms that provide incentives and remove disincentives for utilities to pursue energy efficiency (performance incentives

[12] The other major programs are run by state governments, which are discussed in chapter 5. Additionally in 2011, programs funded by the American Recovery and Reinvestment Act (ARRA) complemented utility program offerings. For an analysis of how ARRA and utility programs interacted, see (Goldman et al 2011).

[13] Energy savings data for natural gas programs are not tracked through a national clearinghouse and are not readily reported by states, so these data do not appear in the scoring. Similarly, programs that save home heating fuel or propane do not systematically report energy savings. In future editions of the *Scorecard*, we plan to examine metrics for energy savings from natural gas, fuel oil, and propane efficiency.

[14] While we have attempted to present the most accurate statewide spending and savings data possible, they should be viewed as imperfect due to the disparate and uneven nature of energy efficiency reporting. We discuss this issue in greater detail in the Conclusion.

and decoupling/lost revenue adjustment mechanisms). We rely on primary reference material (i.e. legislation, commission dockets) for our research. Combined, we allocate seven points to these supporting state policies to emphasize the importance of an effective regulatory environment in promoting energy efficiency and to capture recent advancements not yet reflected in 2010 budget and 2009 savings data. See Table 2 for a summary of state scoring in the five subsets to this policy category.

It should be noted that our chosen methodology does put a handful of states at a disadvantage due to the primary fuels used by utilities. In Hawaii, for example, there is no natural gas service for customers, so energy efficiency is purely aimed at reducing electricity. Thus, the state cannot earn four points (three for budgets, one for gas decoupling and performance incentives) that other states may earn. In other states, energy efficiency efforts may aim to reduce fuel oil consumption, which is not captured in the metrics we use. States with major fuel oil reduction programs are concentrated in the northeast. Despite these drawbacks, we find that our methodology is still the most appropriate measure of utility and public benefits programs and policies advancing energy efficiency.

Table 2. Summary of State Scoring on Utility and Public Benefits Programs and Policies

Rank	State	Electricity Program Budgets for 2010	Electricity Program Savings for 2009	Gas Program Budgets for 2010	Targets (Energy Efficiency Resource Standards)	Utility Incentives and Removal of Disincentives	TOTAL SCORE
	Maximum Possible Points:	*5*	*5*	*3*	*4*	*3*	***20***
1	Vermont	5	5	3	4	2	19
2	Massachusetts	5	3.5	3	4	3	18.5
2	Rhode Island	5	4	2.5	4	3	18.5
4	Minnesota	5	4	2.5	4	2.5	18
5	California	5	3.5	2.5	3.5	3	17.5
6	New York	4.5	2.5	1	4	3	15
7	Iowa	3.5	3.5	3	3.5	0.5	14
8	Oregon	5	2.5	2.5	2	1.5	13.5
8	Washington	5	3	1	3	1.5	13.5
10	Hawaii	1.5	4.5	0	4	2	12
10	Utah	5	2.5	3	0	1.5	12
10	Connecticut	4.5	3.5	2	0	2	12
13	Wisconsin	2.5	3.5	3	0	2.5	11.5
13	Nevada	2.5	5	0.5	2	1.5	11.5
13	Arizona	2.5	3	0.5	4	1.5	11.5
16	Colorado	2.5	2	1	3	2.5	11
17	Maine	2	3	1.5	3	1	10.5
17	New Hampshire	3	2.5	3	0	2	10.5
19	Michigan	1.5	1.5	1	3	3	10
20	Maryland	2	1.5	0.5	3.5	2	9.5
21	Idaho	4.5	3	0.5	0	1	9
21	Illinois	2.5	1.5	0.5	3.5	1	9
23	New Jersey	3	2.5	2.5	0	0.5	8.5
23	Ohio	2	1.5	0.5	2.5	2	8.5
25	Indiana	0	0	1	3	2.5	6.5

Rank	State	Electricity Program Budgets for 2010	Electricity Program Savings for 2009	Gas Program Budgets for 2010	Targets (Energy Efficiency Resource Standards)	Utility Incentives and Removal of Disincentives	TOTAL SCORE
26	District of Columbia	1	1.5	1	0	2.5	6
27	Arkansas	0.5	0.5	1	2	1.5	5.5
28	New Mexico	1.5	1	0.5	1.5	0.5	5
29	Montana	1.5	1.5	0	0	1.5	4.5
29	South Dakota	0.5	0.5	1	0	2.5	4.5
29	North Carolina	0.5	0	0.5	1	2.5	4.5
32	Pennsylvania	1	0.5	0.5	2	0	4
33	Kentucky	0.5	0	0.5	0	2.5	3.5
33	Florida	1	0.5	1	0	1	3.5
35	Texas	0.5	0.5	0	1	1	3
36	Missouri	1	0	0.5	0	1	2.5
36	Oklahoma	1	0	0	0	1.5	2.5
36	Alabama	0	0	0	0	2.5	2.5
36	Louisiana	0	0	0	0	2.5	2.5
36	Delaware	0.5	0	1	0	1	2.5
41	Wyoming	0.5	0	0.5	0	1	2
41	Tennessee	1	0.5	0	0	0.5	2
41	Virginia	0	0	0.5	0	1.5	2
44	Georgia	0	0	0	0	1.5	1.5
44	South Carolina	0	0	0	0	1.5	1.5
44	Nebraska	1	0.5	0	0	0	1.5
47	Kansas	0	0	0	0	1	1
48	Mississippi	0.5	0	0	0	0	0.5
49	North Dakota	0	0	0	0	0	0
49	Alaska	0	0	0	0	0	0
49	West Virginia	0	0	0	0	0	0

Electricity and Natural Gas Efficiency Program Budgets

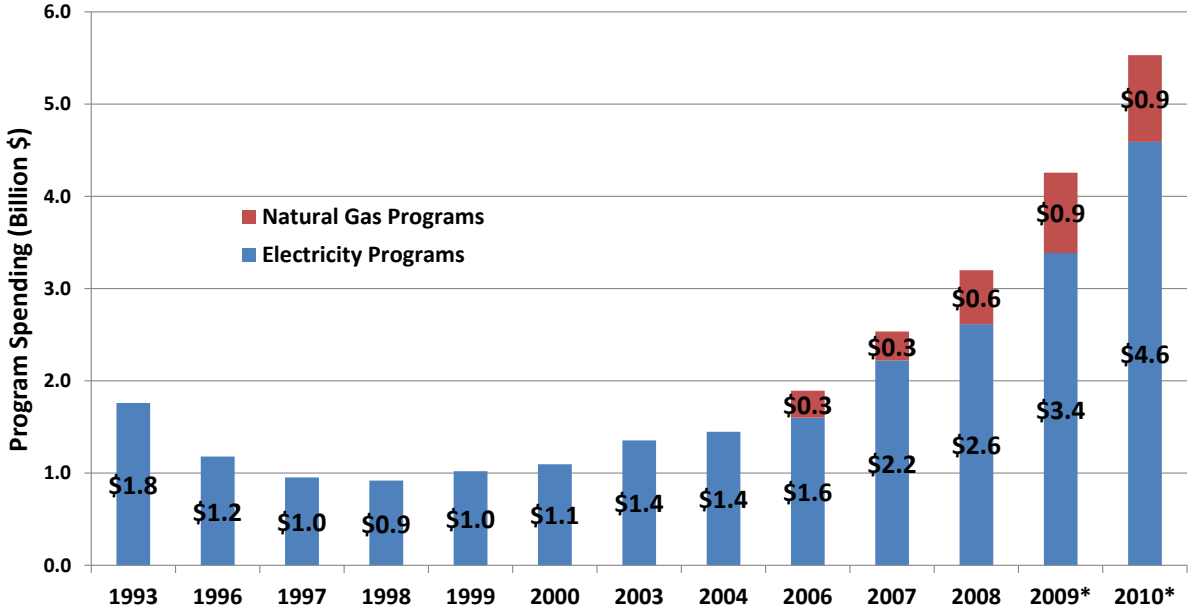
The structure and delivery of ratepayer-funded electric energy efficiency programs[15] have changed dramatically over the past two decades, mostly in conjunction with restructuring efforts. In the 1980s and 1990s, such programs were almost the exclusive domain of utilities; they administered and implemented programs under regulatory oversight. With the advent of restructuring, however, numerous states enacted "public benefits" energy programs that in many cases established new structures and tasked new organizations with the responsibility of administering and delivering energy efficiency and related customer energy programs (including low-income energy programs and renewable energy programs). Not all public benefits programs are administered or delivered by non-

[15] By "ratepayer-funded energy efficiency" programs, we mean energy efficiency programs funded through charges included in customer rates or otherwise paid via 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.

utility organizations, however. In quite a few cases there is a public benefits funding mechanism, but the funds go to the utilities to administer and implement the programs.

Despite the enactment of public benefits programs in some states, restructuring resulted in a precipitous decrease in funding for ratepayer-funded electric energy efficiency programs, from almost $1.8 billion in 1993 to about $900 million in 1998 (nominal dollars). Principal reasons for this decline included uncertainty about newly restructured markets and the expected loss of cost recovery mechanisms for energy efficiency programs. Generally utilities did not see demand-side programs as being compatible with competitive retail markets. Since then, however, efficiency programs have entered a new era of renewed focus and importance. Since 1998, spending has increased more than three-fold from $900 million to about $3.4 billion in 2009 for electricity programs. And in 2010, total budgets for electricity efficiency programs reached about $4.5 billion. Combined with natural gas program budgets of $1 billion in 2010 (discussed later in this chapter), we estimate total budgets of about $5.5 billion on efficiency programs in 2010 (see Figure 1). Given the increasing regulatory commitments to energy efficiency, this growth will likely continue over the next decade.

Figure 1. Annual Electricity and Natural Gas Energy Efficiency Program Spending or Budgets



*All values are actual program spending except for 2009 and 2010, which are budgets. Notes: Includes ratepayer-funded programs. Natural gas efficiency program spending is not available for 1993–2004. Sources: Nadel et al. (2000); York and Kushler (2002), (2005); Eldridge (Molina) et al. (2008), (2009), (2010).

An analysis of state-level energy efficiency policies estimates that ratepayer funding for electric and natural gas energy efficiency programs could rise to $12.4 billion by 2020 (Barbose, Goldman, and Schlegel 2009). In addition to increased spending, the study also suggests a significant broadening of the national energy efficiency market, with a large portion of the projected spending increase coming from states that have historically been relatively minor players in the industry (e.g., Illinois, Michigan, North Carolina, Ohio, and Pennsylvania).

Electricity Program Budgets and Actual Spending

For this section of the report, we score states on reported annual energy efficiency electricity program budgets for 2010. The data presented in this section are for "ratepayer-funded energy efficiency" programs, or energy efficiency programs funded through charges included in customer utility rates or otherwise paid via some type of charge on customer bills. This includes budgets for both utility-administered programs, which depending upon the state may include investor-owned utilities (IOUs), municipal utilities, cooperative utilities, other public power companies or authorities, and for

ratepayer-funded "public benefits" programs administered by other entities. We did not collect data on the federal Weatherization Assistance Program (WAP), which gives money to states on a formula basis. Revenues from the Regional Greenhouse Gas Initiative (RGGI) that contribute to ratepayer-funded energy efficiency program portfolios *are included* in this chapter. However, when RGGI funds are channeled to energy efficiency initiatives implemented by state governments, we have included them in Chapter 5. Similarly, Chapter 5 accounts for applicable funding from the American Recovery and Reinvestment Act that is contributing to energy efficiency programs.

Last year, we shifted from using actual spending on energy efficiency programs to budget figures. In the past we used data gathered by the Energy Information Administration, which reports actual spending with a two-year lag. The rapid increases in energy efficiency funding made it necessary to instead use a data-set that captured a more recent snapshot of energy efficiency funding. The Consortium for Energy Efficiency's *Annual Industry Reports*[16] present energy efficiency budgets from the prior year, so in order to improve the timeliness of the *Scorecard*, we decided to shift towards budget data, principally drawn from CEE's report, which we supplement with information from individual contacts at state utility commissions.

Our energy efficiency budget data differs from the CEE industry data in important ways. This year, we reached out to every state utility commission to confirm energy efficiency spending. During this feedback process with our state contacts, several states provided *revised budget data* that differed from budget data in CEE's report. [17] We seek to provide the most accurate and current information on a state's financial commitment to energy efficiency programs, so we have ranked states on the revised budget data in these cases. See Tables 4 and 6 for detail on which states reported revised budget data. Additionally, CEE includes load management program spending in its overall electric program budgets, whereas we exclude these program budgets.

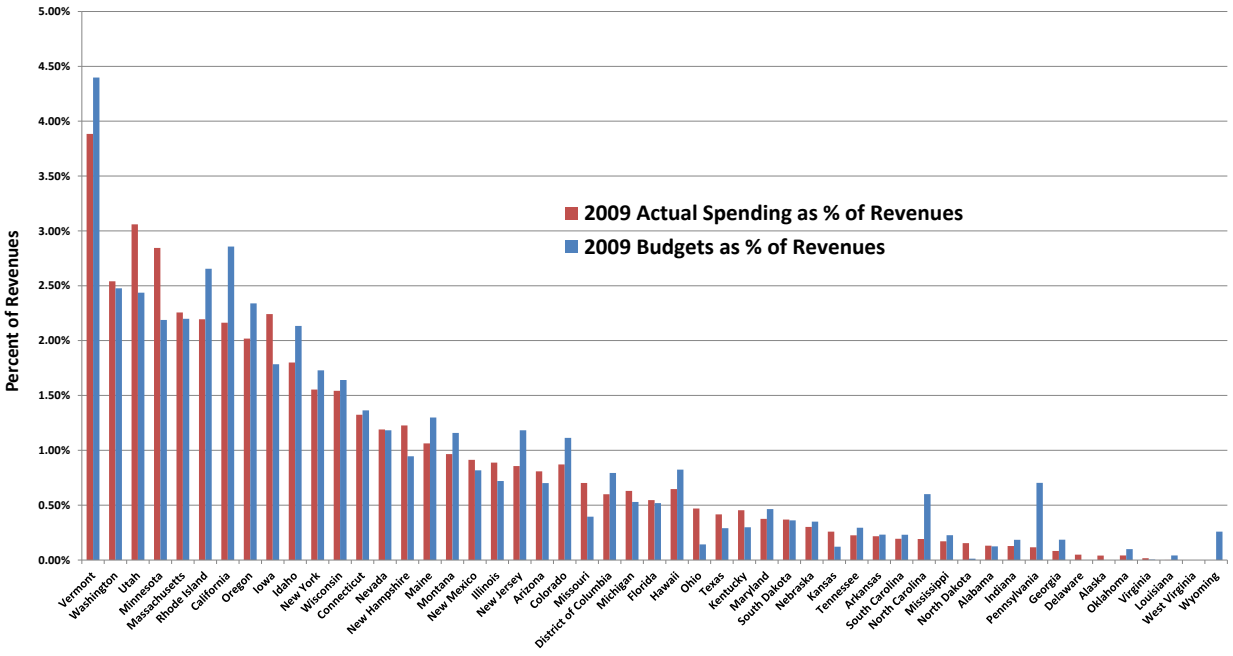
Even with this updated approach to capture more recent program budget data, our methodology still does not fully capture energy efficiency program activity in 2011. Several states are rapidly advancing energy efficiency programs in response to a wave of Energy Efficiency Resource Standards that were passed from 2007 to 2010. Budgets in 2011 will almost certainly be higher in states such as Pennsylvania, Ohio, Michigan, Illinois, Arizona, Rhode Island, and Massachusetts. Utilities in other states such as Georgia and Oklahoma have also moved forward with efficiency program portfolios that should produce results in future *Scorecards.*

On the other side of the coin, these budget figures do not reflect recent energy efficiency budget raids, which are of particular concern in New Jersey, where Governor Christie raided $42.5 million from the state's Clean Energy Fund in FY 2011 to pay state energy bills and proposes to do the same in FY 2012 (NJ Spotlight 2011). Continuing its reversal of progress on energy efficiency, New Jersey is planning to pull out of the Regional Greenhouse Gas Initiative, which had been providing the state with substantial funding for cost-saving energy efficiency projects. The state continues to raid budget funds from its Clean Energy Program to shore up the state budget deficit. In Wisconsin, only months after the state utility commission and a joint committee increased funding increases for energy efficiency, the state legislature repealed the increase and also revoked the Public Service Commission's ability to request energy efficiency funding levels above 1.2% of revenues – a level that essentially flat-lines efficiency spending in the state. Wisconsin's third-party program administrator, Focus on Energy, had previously been approved by the Legislature's Joint Finance Committee based on a recommendation by the Public Service Commission of Wisconsin to ramp up spending from $120 million in 2011 to $256 million in 2014, which would result in annual electric and natural gas savings of 1.5% and 1%, respectively. By repealing this approved increase, Wisconsin will not reach its achievable energy efficiency potential.

[16] Consortium for Energy Efficiency, Annual Industry Reports, Web http://www.cee1.org/ee-pe/AIRindex.php3 2006–2010.
[17] Because utility commissions do not have jurisdiction over municipal and cooperative utilities, we could not confirm the data reported by EIA and CEE for these utilities.

It is also important to clarify that budget data captures intention rather than the execution of energy efficiency spending. The data shows, however, that budget figures have been highly consistent with actual spending. For 2009, our first year for which we tracked both spending and budgets, we found that actual spending was about 90% of the reported budget figures. Nationwide, electric efficiency program budgets totaled around $3.4 billion in 2009, compared to actual spending of $3.1 billion.[18] As Figure 2 depicts, however, some states had significant gaps between budgets and actual spending. Gaps could be explained by lags in program initiation, unforeseen outcomes in program implementation and customer participation, or the ability to deliver program more cost-effectively than anticipated. We recommend a thorough examination of the factors underlying the difference between spending and budgets, which would require research outside the scope of this report.

Figure 2. 2009 Electricity Efficiency Program Spending vs. Budgets



Scoring

Even though a handful of states spent far less (or far more) than they had budgeted, the use of budget figures for the *Scorecard* allows us to present a more up-to-date picture that reflects a state's commitment to energy efficiency programs. States are scored on a scale of 0 to 5 based on levels of energy efficiency budgets as a percent of utility revenues.[19] Budgets representing at least 2.5% of revenues earn the maximum 5 points. For every 0.25% less than 2.5%, a state's score decreases by 0.5 points. Table 3 lists the scoring bins for each level of spending and Table 4 shows state-by-state results and scores for this category.

[18] It should be noted that the budget and spending figures for 2009 are based on two separate data sources. Budget figures for 2009 are drawn from CEE and actual spending data is acquired from EIA and commission staff. CEE reports actual expenditures of $2.98 billion for 2009 U.S. electric efficiency programs in its latest Annual Report. While we have made a good faith effort to ensure the actual spending figure reflects the same utilities that are accounted for in the budget figure, there may be some inconsistency. Budget figures in 2009 have also been revised from last year's Scorecard when we have received corrections (Hawaii). While the data is imperfect, it should give the reader an overall sense of how well budget commitments are being kept.

[19] Statewide revenues drawn from (EIA 2011d). We measure budgets as a percentage of savings to accurately demonstrate the magnitude of energy efficiency spending. Blending utility revenues from all customer classes gives a more accurate measure of its overall spending on EE than expressing budgets per capita, which might skew the data for utilities with a few very large customers (and hence large revenues). Statewide electric energy efficiency budgets per-capita are presented in Appendix A.

Table 3. Scoring Metrics for Electricity Efficiency Program Budgets

Range of Budgets as Percent of Revenues	Score
2.5% or greater	**5**
2.25% – 2.49%	**4.5**
2.00% – 2.24%	**4**
1.75% – 1.99%	**3.5**
1.50% – 1.74%	**3**
1.25% – 1.49%	**2.5**
1.00% – 1.24%	**2**
0.75% – 0.99%	**1.5**
0.50% – 0.74%	**1**
0.25% – 0.49%	**0.5**
Less than 0.25%	**0**

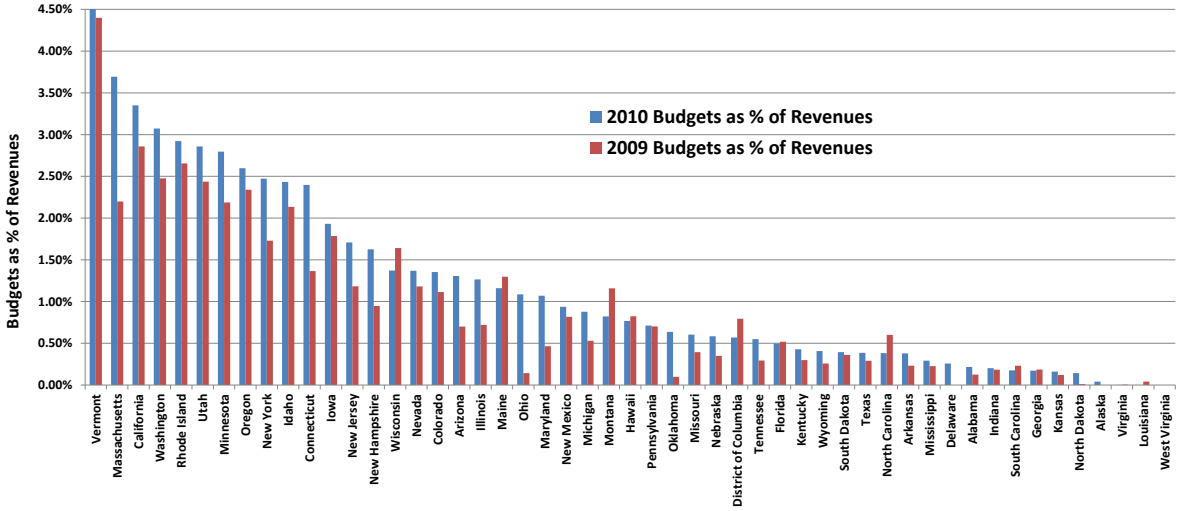
Table 4. 2010 Electricity Efficiency Program Budgets by State

Rank	State	2010 Budgets (Million $)	Budgets as Percent of Revenues	Score
1	Vermont[1]	$34.0	4.57%	5.0
2	Massachusetts[2]	$301.9	3.69%	5.0
3	California	$1,158.1	3.42%	5.0
4	Washington	$184.9	3.35%	5.0
5	Rhode Island[3]	$32.1	2.92%	5.0
6	Utah[4]	$55.5	2.86%	5.0
7	Minnesota[5]	$160.2	2.80%	5.0
8	Oregon	$91.1	2.60%	5.0
9	New York[6]	$583.6	2.47%	4.5
10	Idaho[7]	$36.1	2.43%	4.5
11	Connecticut[8]	$126.9	2.18%	4.5
12	Iowa	$67.8	1.93%	3.5
13	New Jersey[9]	$198.1	1.63%	3.0
14	New Hampshire[10]	$26.3	1.40%	3.0
15	Wisconsin	$92.3	1.37%	2.5
16	Nevada	$45.0	1.37%	2.5
17	Colorado	$64.7	1.35%	2.5
18	Arizona	$92.3	1.26%	2.5
19	Illinois[11]	$165.5	1.23%	2.5
20	Maine	$14.0	1.16%	2.0
21	Ohio	$152.8	1.09%	2.0
22	Maryland[12]	$88.8	1.07%	2.0
23	New Mexico	$17.5	0.94%	1.5
24	Michigan[13]	$91.5	0.88%	1.5
25	Montana	$8.9	0.82%	1.5
26	Hawaii	$19.3	0.77%	1.5
27	Pennsylvania	$110.0	0.71%	1.0
28	Oklahoma	$27.9	0.64%	1.0
29	Missouri[14]	$40.5	0.60%	1.0

Rank	State	2010 Budgets (Million $)	Budgets as Percent of Revenues	Score
30	Nebraska	$13.0	0.58%	1.0
31	District of Columbia[15]	$9.4	0.57%	1.0
32	Tennessee[16]	$48.9	0.55%	1.0
33	Florida	$123.2	0.50%	1.0
34	Kentucky[16]	$27.1	0.43%	0.5
35	Wyoming	$4.3	0.41%	0.5
36	South Dakota[17]	$3.5	0.39%	0.5
37	Texas[18]	$128.4	0.39%	0.5
38	North Carolina[16]	$45.3	0.38%	0.5
39	Arkansas	$13.1	0.38%	0.5
40	Mississippi[16]	$12.5	0.29%	0.5
41	Delaware[19]	$3.6	0.22%	0.5
42	Alabama[16]	$17.7	0.20%	0.0
43	Indiana	$16.5	0.18%	0.0
44	South Carolina	$12.3	0.17%	0.0
45	Georgia[16]	$21.6	0.16%	0.0
46	Kansas[20]	$5.4	0.14%	0.0
47	North Dakota	$1.3	0.12%	0.0
48	Alaska	$0.4	0.04%	0.0
49	Virginia[16]	$0.2	0.00%	0.0
50	Louisiana	$0.0	0.00%	0.0
50	West Virginia	$0.0	0.00%	0.0
	U.S. Total	**$4,595.7**	**1.18% (Average)**	

NOTES: All data are based on CEE (2011) unless otherwise noted here. [1] VT PSB (2011) [2] MA DOER (2011); [3] RI PUC (2010a); [4] RMP (2010); [5] MN PUC (2011); [6] NYSERDA (2011a); [7] ID PUC (2011); [8] CT ECMB (2010); [9] AEG (2011); [10] NH PUC (2011) [11] IL DCEO (2011); [12] MD PSC (2011); [13] MI PSC (2010); [14] MO PSC (2011) [15] DDOE (2011) [16] We add Tennessee Valley Authority (TVA) budgets for energy efficiency programs in these states (TVA 2011) to non-TVA program budgets, which are based on CEE (2010). [17] SD PUC (2011); [18] Frontier Associates (2011)[19] Delaware's Sustainable Energy Utility administers energy efficiency programs using RGGI funding and some state funding and had a budget of about $4.78 million in 2010. The budget is broken down to 75% for electricity programs and 25% to natural gas programs (DNREC 2011). [20] KCC (2011).

Figure 3: Electric Energy Efficiency Program Budgets in 2009 and 2010



Natural Gas Program Budgets

In addition to efficiency programs targeting end-use electricity consumption, we also score states on natural gas efficiency program budgets by awarding up to three points based on 2010 program budget data as reported in the CEE *Annual Report.* In order to directly compare state spending data, we normalize spending to the number of residential natural gas customers by state, which reflects the fact that some states do not have natural gas service for customers throughout the state.[20] Table 5 shows scoring bins for natural gas program spending and Table 6 shows state scoring results. For 2010, natural gas programs budgets totaled about $1.1 billion.

Table 5. Scoring Metrics for Natural Gas Utility and Public Benefits Spending

Budget Range ($ per customer)	Score
$35 or greater	3
$28–34.99	2.5
$21–27.99	2
$14–20.99	1.5
$7–13.99	1
$1—6.99	0.5
Less than $1	0

[20] Residential natural gas customers totals drawn from (EIA 2011a). We use per-capita spending for natural gas because data because revenue data is more difficult to access for natural gas utilities than for electric utilities.

Table 6. 2010 Natural Gas Program Budgets by State

Rank	State	2010 Program Budgets (Million $)[1]	Budgets Relative to Residential Customers ($ per customer)	Score
1	New Hampshire[2]	$6.2	$64.0	3.0
2	Massachusetts[3]	$83.8	$61.2	3.0
3	Vermont	$2.1	$56.4	3.0
4	Iowa	$40.5	$46.2	3.0
5	Utah	$36.1	$44.5	3.0
6	Wisconsin	$64.8	$39.1	3.0
7	Oregon[4]	$22.8	$33.7	2.5
8	California	$338.8	$32.2	2.5
9	New Jersey[5]	$83.0	$31.5	2.5
10	Minnesota	$40.1	$28.2	2.5
11	Connecticut	$11.5	$23.5	2.0
12	Rhode Island[6]	$4.8	$21.3	2.5
13	Maine	$0.4	$19.2	1.5
14	Colorado	$18.4	$11.3	1.0
15	New York[7]	$48.0	$11.1	1.0
16	District of Columbia	$1.5	$10.5	1.0
17	Florida	$6.5	$9.6	1.0
18	Indiana	$14.5	$8.7	1.0
19	Washington	$9.1	$8.6	1.0
20	South Dakota[8]	$1.4	$8.3	1.0
21	Delaware[9]	$1.2	$8.1	1.0
22	Michigan[10]	$25.0	$7.9	1.0
23	Arkansas	$4.2	$7.5	1.0
24	Idaho	$2.1	$6.1	0.5
25	Virginia	$6.2	$5.5	0.5
26	Missouri[11]	$7.1	$5.3	0.5
27	Kentucky[12]	$3.8	$5.1	0.5
28	Pennsylvania	$12.9	$4.9	0.5
29	New Mexico	$2.6	$4.6	0.5
30	Illinois	$17.3	$4.5	0.5
31	Nevada	$3.4	$4.5	0.5
32	Ohio	$11.0	$3.4	0.5
33	Maryland	$3.4	$3.2	0.5
34	Wyoming	$0.4	$2.6	0.5
35	Arizona	$2.6	$2.3	0.5
36	North Carolina	$1.3	$1.2	0.5
37	North Dakota	$0.1	$0.8	0.0
38	Georgia	$1.0	$0.6	0.0
39	Montana	$0.1	$0.4	0.0
40	Texas	$1.6	$0.4	0.0
40	Alabama	$0.0	$0.0	0.0
40	Alaska	$0.0	$0.0	0.0
40	Hawaii[13]	$0.0	$0.0	0.0
40	Kansas	$0.0	$0.0	0.0

Rank	State	2010 Program Budgets (Million $)[1]	Budgets Relative to Residential Customers ($ per customer)	Score
40	Louisiana	$0.0	$0.0	0.0
40	Mississippi	$0.0	$0.0	0.0
40	Nebraska	$0.0	$0.0	0.0
40	Oklahoma	$0.0	$0.0	0.0
40	South Carolina	$0.0	$0.0	0.0
40	Tennessee	$0.0	$0.0	0.0
40	West Virginia	$0.0	$0.0	0.0
	U.S. Total	**$941.6**	**$14.4**	

[1]Data are based on CEE (2010) unless otherwise noted; [2] NH PUC (2011); AEG (2011) [3] MA DOER (2011); [4] ETO (2011); [5]AEG 2011b; [6]RI PUC (2010c); [7]New York data based on CEE and NYSERDA (2011), [8] SD PUC (2011); [9]Delaware's Sustainable Energy Utility administers energy efficiency programs using RGGI funding and some state funding and had a budget of about $4.78 million in 2010. The budget is broken down to 75% for electricity programs and 25% to natural gas programs (DNREC 2011). [10] MI PSC (2010) [11] MO PSC (2011); [12] KY PSC (2011); [13] Hawaii does not have any natural gas providers.

Annual Savings in 2009 from Electricity Efficiency Programs

We measure the overall performance of electric energy-efficiency programs by the amount of electricity actually saved. Electricity savings are generated when a utility or third-party administrator offers an incentive or service program that helps ratepayers save energy in their home or business. Subject to internal or third-party evaluation, monitoring, and verification methodologies, the utility may claim credit for the energy savings the customer will realize. Utilities pursue numerous strategies to achieve energy efficiency savings. For utilities unaccustomed to energy efficiency, program portfolios may initially concentrate on the "lowest-hanging fruit"—generally the installation of lighting and appliances for residential and commercial customers. As utilities gain experience and customers become aware of energy efficiency benefits, program portfolio approaches multiply. States beginning to ramp up funding levels in response to aggressive Energy Efficiency Resource Standards, programs will necessarily shift focus from "widget-based" approaches (i.e. installing a new, efficient water heater) to "deep savings" approaches. "Deep savings" approaches seek new and innovative ways to generate more energy efficiency savings per program participant by conducting whole-building retrofits rather than installing one piece of equipment. "Deep savings" approaches may also include behavioral elements that empower customers with information on energy-use in conjunction with the emphasis on whole-building retrofits and comprehensive changes in both technologies and operations. Some deep savings approaches also extend to complementary programs, such as and building code enforcement programs.[21]

We score the states on annual incremental electricity savings (new savings achieved from measures implemented in the reporting year) in 2009 for electricity energy efficiency programs. [22] As our starting dataset we use EIA Form 861, which we supplement with further research that involves contacting all state utility commissions. States use different methodologies for determining program savings, and we acknowledge that this can produce some inequities when comparing states. A key difference in savings measurement involves how a state treats "free-riders"—savings attributed to programs that would have occurred absent the program, and "free-drivers"—savings not attributed to programs that would not have occurred without programs. We have tried our best to include "net" savings figures,

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

[22] While 2010 savings data is available in some states, it would be unfeasible to compare all 50 states on 2010 data due to significant gaps in reporting across and within the states. Readers should also note that programs that have been running for several years at a high level of funding are achieving the highest levels of *cumulative* electricity savings (total energy savings achieved to date from efficiency measures). *Incremental* savings data, however, are the best way to directly compare state efforts due to the difficulty in tracking the duration of programs and their savings.

which remove savings from "free-riders", rather than gross figures, which may overstate program performance. Absent a more consistent methodology across states, we must rely upon the states' most accurate reporting of energy saved due to programs. Important caveats to the data are noted in the footnotes beneath the table. Among them, a number of states do not have net savings figures available. In these cases, we have reported gross savings rather than applying a generic net-to-gross ratio. Gross savings has different definitions depending on the state. Because many states only reporting gross savings apply deemed savings methodologies that do take into account free-ridership, some gross figures are closer to net figures than others.

Scoring

Although it is an imperfect metric, realized energy efficiency savings is a critical component for the robust analysis of state energy efficiency performance. Statewide energy efficiency savings in 2009 are reported as a percent of retail electricity sales in that year and scored on a scale of 0 to 5.[23] States that achieved savings of at least 1.2% as a percent of electricity sales earn 5 points and score assignments are then distributed evenly among the ten scoring bins, dropping 0.5 points for every 0.12% of annual savings. Table 7 lists the scoring bins for each level of savings and Table 8 shows state-by-state results and scores for this category.

Table 7. Scoring Methodology for Utility and Public Benefits Electricity Savings

Percent Savings Range	Score
1.2% or greater	**5**
1.08% – 1.19%	**4.5**
0.96% – 1.07%	**4**
0.84% – 0.95%	**3.5**
0.72% – 0.83%	**3**
0.60% – 0.71%	**2.5**
0.48% – 0.59%	**2**
0.36% – 0.47%	**1.5**
0.24% – 0.35%	**1**
0.12% – 0.23%	**0.5**
Less than 0.12%	**0**

[23] Statewide electric sales data are drawn from (EIA 2011b).

Table 8. 2009 Incremental Electricity Savings by State

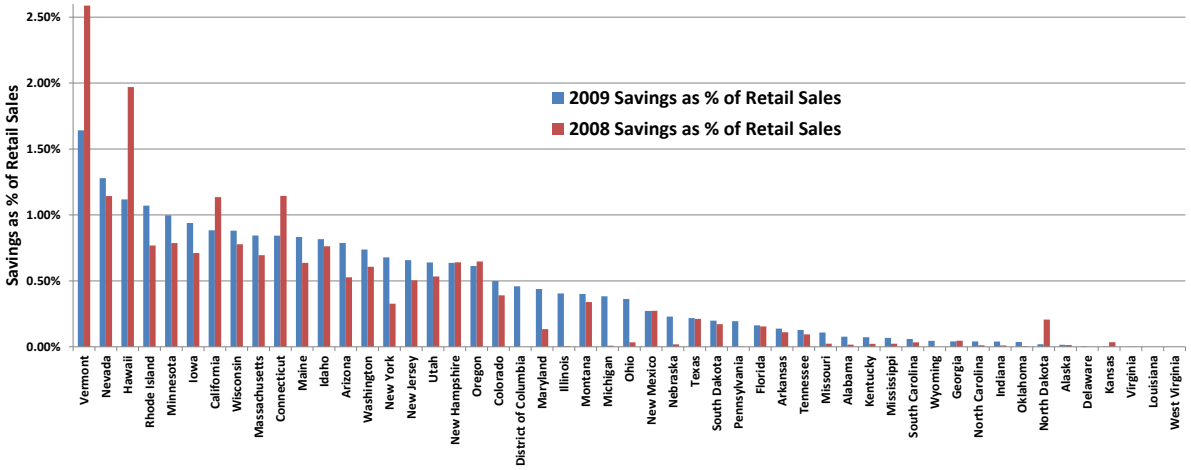
Rank	State	2009 Total Incremental Electricity Savings (MWh)	Savings as Percent of Electricity Sales	Score
1	Vermont[1]	90,235	1.64%	**5.0**
2	Nevada	438,622	1.28%	**5.0**
3	Hawaii[2]	113,159	1.12%	**4.5**
4	Rhode Island[3]	81,543	1.07%	**4.0**
5	Minnesota[4]	637,845*	1.00%	**4.0**
6	Iowa	409,735*	0.94%	**3.5**
7	California[5]	2,293,007	0.88%	**3.5**
8	Wisconsin[6]	583,506	0.88%	**3.5**
9	Massachusetts[7]	458,658	0.84%	**3.5**
10	Connecticut[8]	250,373	0.84%	**3.0**
11	Maine[9]	93,989	0.83%	**3.0**
12	Idaho[10]	185,684	0.82%	**3.0**
13	Arizona[11]	570,634	0.78%	**3.0**
14	Washington[12]	665,204	0.74%	**3.0**
15	New York[13]	949,575	0.68%	**2.5**
16	New Jersey[14]	497,479	0.66%	**2.5**
17	Utah[15]	176,505	0.64%	**2.5**
18	New Hampshire[16]	68,061*	0.64%	**2.5**
19	Oregon[17]	291,658	0.61%	**2.0**
20	Colorado[18]	254,588	0.50%	**2.0**
21	District of Columbia[19]	55,911	0.46%	**1.5**
22	Maryland[20]	274,239	0.44%	**1.5**
23	Illinois[21]	553,152	0.40%	**1.5**
24	Montana[22]	57,337	0.40%	**1.5**
25	Michigan[23]	375,652	0.38%	**1.5**
26	Ohio	530,062	0.36%	**1.5**
27	New Mexico[24]	58,916	0.27%	**1.0**
28	Nebraska	65,226	0.23%	**0.5**
29	Texas[25]	750,628	0.22%	**0.5**
30	South Dakota[26]	21,828	0.20%	**0.5**
31	Pennsylvania[27]	278,925*	0.19%	**0.5**
32	Florida	364,599	0.16%	**0.5**
33	Arkansas[28]	59,759*	0.14%	**0.5**
34	Tennessee[29]	120,769	0.13%	**0.5**
35	Missouri[30]	86,331	0.11%	**0.0**
36	Alabama[29]	63,382*	0.08%	**0.0**
37	Kentucky[29]	64,652	0.07%	**0.0**
38	Mississippi[29]	31,188	0.07%	**0.0**
39	South Carolina[31]	45,642*	0.06%	**0.0**
40	Wyoming[32]	7,400	0.04%	**0.0**
41	Georgia[29]	53,649	0.04%	**0.0**
42	North Carolina[29 31]	51,916*	0.04%	**0.0**
43	Indiana	39,903	0.04%	**0.0**

Rank	State	2009 Total Incremental Electricity Savings (MWh)	Savings as Percent of Electricity Sales	Score
44	Oklahoma	20,300	0.04%	**0.0**
45	North Dakota	2,530	0.02%	**0.0**
46	Alaska	965	0.02%	**0.0**
47	Delaware	490	0.00%	**0.0**
48	Kansas[33]	971	0.00%	**0.0**
49	Virginia[29]	1,029	0.00%	**0.0**
50	Louisiana	0	0.00%	**0.0**
50	West Virginia	0	0.00%	**0.0**
	U.S. Total	13,147,411	0.37%	

*Reported gross savings as net savings figures were unavailable
Notes: All savings data are as reported in EIA (2010a) unless noted otherwise below.

[1] VT PSB (2011); [2] Hawaii Energy (2010) Savings are for Program Year 2010; [3] RI PUC (2010b); [4] MN PUC (2011); [5] CPUC (2011); [6] Wisconsin utility savings from EIA and WI PSC; Focus on Energy savings from FOE [7] MA DOER (2011); [8] CT ECMB (2010); [9]EM (2010) Savings are for Program Year 2010; [10]Idaho savings from utility reports filed with Idaho Public Utilities Commission: Avista (2010), ID RMP (2010) , IDP (2010); [11] AZCC (2011); [12] Washington public utility savings from EIA; WA UTC (2011); [13] Savings data for New York are derived by combining utility savings data reported by EIA with the statewide program administrator's (NYSERDA) savings data (NYSERDA 2011b) [14] AEG (2011); [15] Rocky Mountain Power gross savings are adjusted to net savings using net to gross ratios presented in Appendix 1 of RMP (2010). [16] NH PUC (2011); [17] ACEEE estimate based on ETO (2011); [18] Savings for Public Service Colorado are from CO PSCo (2010). [19] DDOE (2011); [20] MD PSC (2011); [21] IL DCEO (2011); [22] Montana public utility savings from EIA, MT PSC (2011); [23] MI PSC (2010); [24] Xcel Energy (2011); NM PRC (2011); [25] Frontier Associates (2011); [26] SD PUC (2011); [27] PA PUC (2010); [28] Arkansas savings figures derived from Arkansas Public Service Commission Docket Nos. 08-038-RP, 08-039-RP, and 08-049-RP; [29] We add Tennessee Valley Authority (TVA) savings in these states (TVA 2011) to non-TVA program savings, which are based on EIA (2010a); [30] MO PSC (2011); [31] Duke Energy Carolinas savings apportioned out to North Carolina and South Carolina according to NC Docket E-7 Sub 979 and SC docket 2011-40-E. [32] SWEEP (2010) [33] Several Kansas utilities did reported spending but no savings to EIA and Kansas Corporation Commission; the savings figure presented here comes from KCC (2011).

Figure 4: Electric Energy Savings from Ratepayer-Funded Programs in 2008 and 2009[24]



Energy Savings Targets (Energy Efficiency Resource Standards)

Twenty-four states now have policies in place that establish specific energy savings targets that utilities or related organizations must meet through customer energy efficiency programs. These policies—called "energy efficiency resource standards" (EERS)—are analogous to "renewable portfolio standards," also in place in a majority of the states. An EERS sets multi-year electric or

[24] We have revised 2009 savings figures in Utah to reflect net, rather than gross savings.

natural gas efficiency targets (e.g., 2% incremental savings per year or 20% cumulative savings by 2020), presented as a percentage of retail sales.[25] Energy efficiency savings are typically measured by the first-year savings of energy-efficient measures installed. EERS policies accelerate and expand the scale of energy savings achieved through utility and related energy efficiency programs. This year, Arkansas was the only new state to adopt an EERS, while regulators in Florida and the state legislature in Wisconsin took actions to render their energy savings targets ineffective. Most states with EERS's in place are meeting current goals and on track to meet future goals.[26]

The widespread adoption of EERS policies represents a significant evolution in the treatment of energy efficiency in the utility system. The EERS has an explicit focus on quantifiable energy savings results, which directly reinforces the expectation that energy efficiency is a real utility system "resource," and helps utility system planners more clearly anticipate and project the effect of energy efficiency programs on utility system loads and resource needs. Moreover, EERS targets are generally set at levels that push programs to achieve higher savings than they would have targeted prior to enactment. EERS policies maintain strict requirements for cost-effectiveness so that programs are insured to provide overall benefits to customers. Not only does an EERS drive utilities and program administrators to achieve greater levels of savings, but it also helps 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 high savings levels.[27]

Key Distinctions of EERS Policies

EERS policies encompass three distinct types of policy approaches, all of which accomplish the same outcome—setting binding, long-term targets for energy efficiency savings from utility programs (Sciortino et al. 2011). The three approaches are a statewide Energy Efficiency Resource Standard, long-term energy savings targets set by utility commissions tailored to individual utilities or third-party administrators, and incorporating energy efficiency as an eligible resource in renewable portfolio standards (RPS). While the latter two options may not technically be considered a "standard" in the traditional sense, ACEEE has defined all three approaches as an EERS to avoid confusion and draw focus to the key similarity of all these policies—establishing binding, long-term energy savings targets. Certain states such as Massachusetts, Rhode Island, Washington, California, and others have a statewide EERS that operates in the following manner: (1) state law broadly requires utilities to procure all cost-effective efficiency resources ("an efficiency procurement requirement"); and (2) planning processes between the utilities, stakeholder efficiency councils, and public utility commissions (PUCs) then establish the specific percentage savings targets the utilities are required to meet to effectuate the all cost-effective efficiency procurement requirement. These states have set increasingly aggressive—and fully funded—efficiency savings targets.

[25] "Multi-year" is defined as three or more years. EERS policies may also set specific gigawatt-hour (GWh) energy savings targets without consideration of percentage of prior-year sales, or as a percentage of load growth.

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

[27] A recent ACEEE report, *Energy Efficiency Resource Standards: A Progress Report on State Experience,* analyzes current trends in EERS implementation and finds that most states are meeting or on track to meet energy savings targets (Sciortino et al 2011). Thirteen of the twenty states with EERS policies in place for over two years are achieving 100% or more of their goals, three states are achieving over 90% of their goals, and only three states are realizing savings below 80% of their goals. One state, North Carolina, has yet to hit its first target date.

Figure 5: Key Distinctions of EERS Policies

Statewide EERS	Tailored Utility Target	Combined EERS–RPS
Typically set by state legislatures and codified by utility commissions, the statewide EERS calls for all eligible utilities to achieve a prescribed level of savings. In efficiency procurement states, the state legislatures have required utilities to invest in all cost-effective efficiency and the specific targets are then set by stakeholder councils and PUCs.	Initiated in a variety of ways, long-term energy efficiency targets in these states are tailored to each specific utility or third-party administrator. In each case, law or regulation calls for the establishment of multi-year (3-year+) specific energy savings targets.	Energy efficiency may be accepted as an eligible resource in state renewable energy standards (RPS). In these cases, energy efficiency is measured on a cumulative, rather than annual, incremental basis.
Arizona, Arkansas, California, Illinois, Indiana, Massachusetts, Michigan, Minnesota, New Mexico, New York, Ohio, Pennsylvania, Texas	Colorado, Iowa, Maine, Oregon, Rhode Island, Vermont	Hawaii, Nevada, North Carolina

Scoring

A state can earn up to 4 points for an EERS policy based on a number of factors. The major considerations include target levels, whether the EERS covers electric and natural gas, and if the policy is binding. Some EERS policies contain "exit ramps" for utilities to avoid meeting the target or "cost caps" that limit a spending amount (e.g., Illinois). Table 9 explains the scoring methodology in detail. To directly compare the targets, we normalize savings targets to an estimated average annual savings target over the period that the target covers. For example, Arizona plans to achieve 22% cumulative savings by 2020, so the annual average target is 2.2%.

States with pending targets must be on a clear path towards establishing a binding mechanism to earn points in this category. Examples of a clear path include draft decisions by Commissions awaiting approval within six months, or agreements among major stakeholders on targets. States with a pending EERS policy that have not yet established a clear path toward implementation include Alaska, Oklahoma, New Hampshire, Utah, Delaware, and Virginia.[28] See Table 10 for scoring results and policy details.

Table 9. Scoring Methodology for Energy Savings Targets

Percent Savings Target or Current Level of Savings Met	Score
1.5% or greater	4
1% – 1.49%	3
0.5% – 0.99%	2
0.1% – 0.49%	1
Less than 0.1%	0

Other Considerations	Score
Cost cap inhibiting state from meeting targets	-1
Exit ramps	-0.5
EERS includes Natural Gas	+0.5

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

Table 10. State Scores for Energy Savings Targets

State Year Enacted Electric/Natural Gas Policy Type	Energy Efficiency Resource Standard	Approx. Annual Savings Target (Electric)	Binding Target or "Exit Ramp"	Reference	Score
Arizona 2009 Electric and Natural Gas EERS	Electric: 1.25% in 2011, ramping up to 2.5% annual savings beginning in 2015 through 2020. Cumulative savings of 22% by 2020. Natural Gas: 6% cumulative savings by 2020	2.2%	Binding	Docket Nos. RE-00000C-09-0427, Decision No. 71436	**4**
Hawaii[29] 2004 and 2009 Electric RPS - EERS and EERS	Renewable Portfolio Standards include 15% electrical energy savings through 2015. Starting in 2015 all electric utility savings will count towards Hawaii's Energy Efficiency Portfolio Standards (EEPS). EEPS long-term goal is 4,300 GWh reduction by 2030, or 30% of sales.	1.5%	Binding	HRS §269-91, 92, 96	**4**
Massachusetts[30] 2009 Electric and Natural Gas EERS	Electric: 2.0% in 2011; 2.4% in 2012 Natural Gas: 0.83% in 2011; 1.15% in 2012	2.4%	Binding	Electric: D.P.U. Order 09-116 through 09-120) Natural Gas: D.P.U. Order 09-121 through 09-128	**4**
Minnesota 2007 Electric and Natural Gas EERS	Electric: 1.5% annual savings beginning in 2010 Natural Gas: 0.75% annual savings from 2010-2012; 1.5% annual savings in 2013	1.5%	Binding	Minn. Stat. § 216B.241	**4**
New York 2008 Electric and Natural Gas EERS	Electric: 15% Cumulative savings by 2015 Natural Gas: ~14.7% Cumulative savings by 2020	1.9%	Binding	Electric: NY PSC Order, Case 07-M-0548 Natural Gas: NY PSC Order, Case 07-M-0748	**4**

[29] Although Hawaii does not currently have a mandated annual goal for energy efficiency, ACEEE estimates that the current 30% goal will result in 1.5% annual savings through utility programs.

[30] The underlying statute, Mass. General Laws c. 25 § 21, requires gas and electric efficiency program administrators to procure "all energy efficiency and demand reduction resources that are cost effective or less expensive than supply."

State Year Enacted Electric/Natural Gas Policy Type	Energy Efficiency Resource Standard	Approx. Annual Savings Target (Electric)	Binding Target or "Exit Ramp"	Reference	Score
Rhode Island 2006 Electric and Natural Gas Tailored Utility Targets	Electric: 1.5% in 2011; 1.7% in 2012, 2.1% in 2013, and 2.5% in 2014 Natural Gas: ~0.4% of sales in 2011; 0.6% in 2012, -0.8% in 2013, and 1.0% in 2014	2.0%	Binding	R.I.G.L § 39-1-27.7	**4**
Vermont 2000 Electric Tailored Utility Targets (Efficiency Vermont)	~6.75% cumulative savings from 2009 to 2011[31]	2.25%	Binding	30 V.S.A. § 209; VT PSB Docket 5980; 11-year Order of Appointment (Docket 7466)[32]	**4**
California[33] 2004 and 2009 Electric and Natural Gas EERS	Electric: ~1% annual savings through 2020 Natural Gas: 150 gross MMTh by 2012	1.0%	Binding	CPUC Decision 04-09-060; CPUC Decision 08-07-047; CPUC Decision 09-09-047	**3.5**
Illinois 2007 Electric and Natural Gas EERS	Electric: 0.8% annual savings in 2011, ramping up to 1% in 2012, 2% in 2015 and thereafter Natural Gas: 8.5% cumulative savings by 2020 (0.2% annual savings in 2011, ramping up to 1.5% in 2019)	1.7%	Cost Cap	S.B. 1918 Public Act 96-0033 § 220 ILCS 5/8-103	**3.5**

[31] Vermont Public Service has tentatively approved a 2012-2014 budget for Efficiency Vermont, which will achieve approximately 2.2% annual savings (VT Public Service Board Docket EEU-2010-06, Order Entered 8/1/2011).
[32] Goals for 2009 and 2010 were combined. Efficiency Vermont also set goals in previous years in three-year intervals.
[33] California's goals presented as gross savings. A rough estimate of California's goal as net savings can be achieved by converting gross savings to net savings using the 2009 net to gross conversion factor of 61% (CPUC 2011). Net goals are approximately 0.8% annual savings for the period 2010-2013, dropping to 0.55% from 2014-2020. California's evaluation and attribution methods are some of the strictest in the country, however, which partly explains the low net to gross conversion factor.

State Year Enacted Electric/Natural Gas Policy Type	Energy Efficiency Resource Standard	Approx. Annual Savings Target (Electric)	Binding Target or "Exit Ramp"	Reference	Score
Iowa 2009 Electric and Natural Gas Tailored Utility Targets	Electric: Varies by utility from 1-1.5% annually by 2013 Natural Gas: Varies by utility from 0.74-1.2% annually by 2013	1-1.5%	Binding	Senate Bill 2386 and Iowa Code § 476	**3.5**
Maryland[34] 2008 Electric EERS	15% per-capita electricity use reduction goal by 2015 with targeted reductions of 5% by 2011 calculated against a 2007 baseline (10% by utilities, 5% achieved independently)	1.5-1.8%	Binding (Utility portion only)	Md. Public Utility Companies Code § 7-211	**3.5**
Colorado 2007 Electric Tailored Utility Targets	Electric: PSCo and Black Hills Energy (BHE) both aim for 0.9% of sales in 2011 and increase to 1.35% (1.0% for BHE) of sales in 2015 and then 1.66% (1.2%) of sales in 2019	1-1.5%	Binding	Colorado Revised Statutes 40-3.2-101, et seq. ; COPUC Docket No. 08A-518E; Docket 10A-554EG	**3**
Indiana 2009 Electric EERS	0.5% annual savings in 2011, increasing to 1.1% in 2014, and leveling at 2% in 2019.	1.2% (avg. through 2019)	Binding	Cause No. 42693, Phase II Order	**3**
Maine 2010 Electric and Natural Gas Tailored Utility Targets (Efficiency Maine)	Electricity: Annual energy savings of ~1% in FY2011, ramping up to 1.4% in FY2013. Natural Gas: 130 BBtu annually by FY2013	1.25%	Cost Cap	Efficiency Maine Trust: Triennial Plan	**3**
Michigan 2008 Electric and Natural Gas EERS	Electric: 0.75% annual savings in 2011, 1% in 2012 and thereafter Natural Gas: 0.5% annual savings in 2011, 0.75% in 2012 and thereafter	1%	Cost Cap	M.G.L. ch. 25, § 21; Act 295 of 2008	**3**

[34] The 15% per-capita electricity use reduction goal translates to around 17% cumulative savings over 2007 retail sales.

State Year Enacted Electric/Natural Gas Policy Type	Energy Efficiency Resource Standard	Approx. Annual Savings Target (Electric)	Binding Target or "Exit Ramp"	Reference	Score
Washington 2006 Electric EERS	Biennial and Ten-Year Goals vary by utility. Law requires savings targets to be based on the Northwest Power Plan, which estimates potential savings of about 1.5% savings annually through 2030 for Washington utilities.	1-1.5%	Binding	Ballot Initiative I-937 WAC 480-109 WAC 194-37	**3**
Ohio 2008 Electric EERS	22% by 2025 (0.7% annual savings in 2011, ramping up to 1% in 2014 and 2% in 2019)	1.3% (avg. through 2025)	Exit Ramp	ORC 4928.66 et seq. S.B. 221	**2.5**
Arkansas 2010 Electric and Natural Gas EERS	Annual reduction of 0.25% of total electric kilowatt hour (kWh) sales to 0.75% of total electric kWh sales from 2011-2013 (slightly less for natural gas).	Approx. 0.5% (avg. through 2013)	Binding	Order No. 17, Docket No. 08-144-U; Order No. 15, Docket No. 08-137-U	**2**
Nevada 2005 and 2009 Electric RPS - EERS	20% Renewable energy by 2015 and 25% by 2025—energy efficiency may meet a quarter of the standard in any given year, or 5% cumulative savings by 2015 and 6.25% by 2025.	Up to 0.6% per year	Binding	NRS 704.7801 et seq.	**2**
Oregon 2010 Electric and Natural Gas Tailored Utility Targets (Energy Trust of Oregon)	Electric targets are equivalent to 0.8% of 2009 electric sales in 2010, ramping up to 1% in 2013 and 2014. Natural Gas: 0.2% of sales in 2010 ramping up to 0.4% in 2014	0.9% (avg. through 2014)	Exit Ramp	Energy Trust of Oregon 2009 Strategic Plan	**2**
Pennsylvania 2004 and 2008 Electric EERS	1% Cumulative savings by 2011, 3% by 2013	0.8% (avg. through 2013)	Cost Cap	66 Pa C.S. § 2806.1; PUC Order Docket No. M-2008-2069887	**2**

State Year Enacted Electric/Natural Gas Policy Type	Energy Efficiency Resource Standard	Approx. Annual Savings Target (Electric)	Binding Target or "Exit Ramp"	Reference	Score
New Mexico 2008 Electric EERS	5% reduction from 2005 total retail electricity sales by 2014, and a 10% reduction by 2020	0.7% (avg. through 2020)	Exit Ramp	N.M. Stat. § 62-17-1 et seq.	**1.5**
North Carolina 2007 Electric RPS - EEERS	Renewable Energy and Energy Efficiency Portfolio Standard (REPS). Investor-owned: 12.5% by 2021 and thereafter. Energy efficiency is capped at 25% of the 2012-2018 targets and at 40% of the 2021 target.	Up to 0.25% in 2012; no specific EE goal	Cost Cap	N.C. Gen. Stat. § 62-133.8 04 NCAC 11 R08-64, et seq.	**1**
Texas 1999 and 2007 Electric EERS	20% Incremental Load Growth in 2011 (equivalent to ~0.10% annual savings); 25% in 2012, 30% in 2013+[35]	Approx. 0.40%	Cost Cap	Senate Bill 7; House Bill 3693; Substantive Rule § 25.181	**1**

[35] In the 2011 legislative session, Texas adopted Senate Bill 1125, which amends the EERS policy by requiring utilities to achieve savings of 0.4% of each company's annual load beginning in 2013. As a result, utilities with declining or rapidly growing load growth will have more predictable and consistent goals than those that were set based on load growth. The Bill also added focus on reducing demand in the winter, which is more likely to result in real energy efficiency savings than summer demand response programs, which simply shift load and reduce peak demand. The actual demand response goals will likely be based on summer demand. The Bill does not remove the cost caps adopted in 2010.

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 that is sometimes referred to as "lost revenues" or "lost sales." Since utilities' earnings are usually based on the total amount of capital invested in selected asset categories (such as transmission lines and power plants) and the amount of electricity sold (kilowatt-hours), the financial incentives are very much tilted in favor of increased electricity sales and expanding supply-side systems.

Understanding this dynamic has led industry experts to devise ways of addressing possible earnings and profit losses that can result from customer energy efficiency programs while removing the disincentive to promote energy efficiency among utilities' customers. There are three key policy approaches to address the removal of disincentives and the implementation of positive incentives for reducing customer energy use through improved energy efficiency. The first of these policy mechanisms is to ensure recovery of 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. We do not address such basic program cost recovery in our *Scorecard*.

The other two mechanisms are fixed cost recovery (decoupling and other lost revenue adjustment mechanisms) and shareholder incentives. Decoupling refers to the disassociation of a utility's revenues from sales, which makes the utility indifferent to losses or increases in sales. Although this does not necessarily make the utility more likely to promote efficiency programs, it removes the disincentive for them to do so. Additional mechanisms for addressing lost revenues include modifications to rates that permit utilities to collect the revenues “lost” either through a lost revenue adjustment mechanism (LRAM) or other ratemaking approach. Shareholder incentives are financial incentives that reward utilities (and in some cases, non-utility organizations) for reaching or exceeding specified program goals. ACEEE views decoupling as the preferred approach to properly align utility incentives, and sees LRAM as a second-best approach to addressing similar challenges. Similarly, ACEEE recommends a shareholder incentive that is awarded based on achievement of actual energy savings targets, as opposed to spending goals. These mechanisms have received a great deal of attention recently with a number of states enacting them in order to support increased energy efficiency initiatives and programs. While this section captures enabling policies, other sections of this chapter capture the performance and scale of utility energy efficiency programs.

Scoring

For this category, a state can earn up to 3 points for having adopted financial incentive mechanisms for utility electric and natural gas efficiency programs and for having implemented decoupling for addressing lost revenues for its electric and natural gas utilities (see Table 11). States with at least one major utility program were given credit. Information about individual state decoupling policies and financial incentive mechanisms is available on ACEEE’s State Energy Efficiency Policy Database[36] and in Appendix D.

The scoring methodology changed slightly from last year to include states with ratemaking approaches for recovering lost revenues that are not traditional decoupling or LRAM approaches. Additionally, we attempted to simplify the scoring criteria by splitting the 3 points for lost revenues and incentives into two 1.5 point blocks to clearly illustrate to readers which states have policies in place or pending and whether they apply to electric or natural gas utilities. As decoupling is a preferred method for addressing the issue of lost revenues this approach is weighted more favorably than an

[36] See http://www.aceee.org/sector/state-policy

LRAM or ratemaking approach.[37] Details describing the scoring methodology are provided in Table 11.

Table 11. States Scoring Methodology for Utility Financial Incentives

Scoring Criteria for Addressing "Lost Revenues"	Points
Decoupling has been established for both electric and natural gas utilities for at least one major utility.	1.5
Decoupling established for either electric or natural gas utilities for at least one major utility. LRAM or ratemaking approach for recovery of lost revenues established for both electric and natural gas utilities for at least one major utility.	1
The legislature or regulatory commission has authorized or recommended decoupling, but it has not yet been implemented. LRAM or ratemaking approach for recovery of lost revenues established for **either** electric **or** natural gas utilities for at least one major utility.	0.5
Scoring Criteria for Addressing "Shareholder Incentives"	**Points**
Shareholder incentives established for both electric and natural gas utilities for at least one major utility (or non-utility organizations).	1.5
Shareholder incentives established for at least one electric or natural gas utility or non-utility organization.	1
The legislature or regulatory commission has authorized or recommended shareholder incentive but the use of a given mechanism has not yet been implemented.	0.5

Table 12. Utility Efforts to Address Lost Revenues and Financial Incentives

	Decoupling (or Related Mechanism)		Performance Incentives		
State	Electricity	Natural Gas	Electricity	Natural Gas	Score
California	Yes	Yes	Yes	Yes	3
Massachusetts	Yes	Yes	Yes	Yes	3
Michigan	Yes	Yes	Yes	Yes	3
New York	Yes	Yes	Yes	Yes	3
Rhode Island	Yes	Yes	Yes	Yes	3
Alabama	Yes^	Yes^	Yes	Yes	2.5
Colorado	Yes^	Yes	Yes	Yes	2.5
Indiana	Yes^	Yes	Yes	Yes	2.5
Kentucky	Yes^	Yes^	Yes	Yes	2.5
Louisiana	Yes^	Yes^	Yes	Yes	2.5
South Dakota	Yes^	Yes^	Yes	Yes	2.5
Wisconsin	Yes	Yes^	Yes	Yes	2.5
District of Columbia	Yes	No	Yes	Yes	2.5
Minnesota	Yes*	Yes	Yes	Yes	2.5

[37] Hayes S., S. Nadel, M. Kushler, D. York. September 2011. Balancing Interests: A Review of Lost Revenue Adjustment Mechanisms for Utility Energy Efficiency Programs. Washington, D.C.: ACEEE.

	Decoupling (or Related Mechanism)		Performance Incentives		
State	Electricity	Natural Gas	Electricity	Natural Gas	Score
North Carolina	Yes~	Yes	Yes	No	2.5
Connecticut	Yes~	Yes^	Yes	No	2
Hawaii	Yes	No	Yes	No	2
Ohio	Yes^	Yes^	Yes	Yes*	2
Maryland	Yes	Yes	Yes*	Yes*	2
New Hampshire	Yes*	Yes*	Yes	Yes	2
Vermont	Yes	Yes^	Yes	No	2
Arkansas	Yes^	Yes^	Yes*	Yes*	1.5
Georgia	Yes^	No	Yes	No	1.5
Montana	Yes^	Yes^	Yes*	Yes*	1.5
Nevada	Yes^	Yes	Yes*	No	1.5
Oklahoma	Yes^	No	Yes	No	1.5
South Carolina	Yes^	No	Yes	No	1.5
Arizona	Yes^*	Yes*	Yes	No	1.5
Oregon	Yes	Yes	No	No	1.5
Utah	Yes*	Yes	Yes*	Yes*	1.5
Virginia	Yes^*	Yes	Yes*	No	1.5
Washington	Yes*	Yes~	Yes*	Yes*	1.5
Missouri	Yes^*	Yes^	Yes*	Yes*	1
Florida	Yes^*	Yes*	Yes*	Yes*	1
Idaho	Yes	No	No	No	1
Illinois	No	Yes	No	No	1
Kansas	Yes^	Yes*	Yes*	Yes*	1
Maine	Yes*	Yes*	Yes*	Yes*	1
Texas	No	No	Yes	No	1
Delaware	Yes*	Yes	No	No	1
Wyoming	Yes^	Yes	No	No	1
New Jersey	Yes^*	Yes^	No	No	0.5
New Mexico	Yes^*	Yes^*	Yes*	Yes*	0.5
Tennessee	No	Yes^	No	No	0.5
Iowa	No	Yes*	No	No	0.5
Alaska	No	No	No	No	0
Mississippi	No	No	No	No	0
Nebraska	No	No	No	No	0
North Dakota	No	No	No	No	0
Pennsylvania	No	No	No	No	0
West Virginia	No	No	No	No	0

* Decoupling for electric or gas utilities, or both, or performance incentives are authorized according to legislation or commission order but are not yet implemented.
^ No decoupling, but some other mechanism for lost revenue adjustment.
~ Both decoupling and some other mechanism for lost revenue adjustment.

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

California: California utilities have implemented energy efficiency programs for decades, achieving substantial savings thanks to significant regulatory and budget support from the California Public Utilities Commission (CPUC). The state implemented decoupling in 1982 for its three electric investor-owned utilities, which has played a major role in the state's success with energy efficiency. California invests about $1 billion per year in energy efficiency to achieve consistently impressive levels of cost-effective energy savings. California public- and investor-owned utilities are national leaders in energy efficiency program implementation, consistently achieving savings around 1% of sales annually.

Massachusetts: Massachusetts has a long record of success implementing energy efficiency programs, which are managed and implemented by electric and natural gas distributors. The state took a major leap forward in 2008, however, when it passed the Green Communities Act (GCA), which established energy efficiency as the state's "first-priority" resource, creating an Energy Efficiency Advisory Council to collaborate with utilities to develop statewide efficiency plans in three-year cycles. The three-year plan in operation aims to achieve electric savings equal to 2.4% and natural gas savings equal to 1.5% of sales in 2012, which amounts to the most aggressive EERS target in the nation. The GCA is ultimately expected to lead to an investment of $2.2 billion in energy efficiency and demand resources between 2010 and 2012.

Minnesota: Minnesota's investor- and publicly-owned utilities offer broad portfolios of energy efficiency programs, which have benefitted from consistent and strong regulatory support, allowing them to evolve and improve for many years. The state has long encouraged energy efficiency by allowing utilities to earn an incentive for successful energy efficiency program performance. Not content to rest on its laurels, the state enacted the Next Generation Act in 2007, which set aggressive energy-saving goals for utilities equal to 1.5% of sales each year, raising the bar for program performance. The impact of the EERS is becoming evident in the steadily increasing savings figures in the state.

Rhode Island: Building on its strong program history, Rhode Island leapt forward with the Comprehensive Energy Conservation and Affordability Act of 2006, which established energy efficiency as the state's first-priority resource and set the framework for major investments in energy efficiency programs. Similar to Massachusetts, the state's major utility collaborates with an expert council to develop three-year plans with savings and budget goals. In its latest plan, approved for 2012-2014, the state seeks to reach 2.5% annual electric savings and 1.2% annual natural gas savings in 2014.

Vermont: Vermont pioneered the third-party administration model of energy efficiency program implementation, which has been replicated in states such as Maine, New Jersey, D.C., Delaware, and Oregon. Efficiency Vermont, the state's "energy efficiency utility", runs energy efficiency programs for a wide range of customers and leads the nation in producing energy savings. Vermont's excellent performance is due in large part to a strategic commitment by the Vermont Public Service Board (PSB) to fund programs at aggressive levels to reach new customers and achieve deep savings. The PSB has also put in place the proper mix of policies, including energy savings targets (EERS) and performance incentives to encourage successful programs.

CHAPTER 2: TRANSPORTATION POLICIES

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

At the federal level, major progress has been made recently in reducing car and truck fuel consumption. Federal Corporate Average Fuel Economy (CAFE) standards adopted in April, 2010 require a fleet fuel economy of 34.1 mpg by 2016. The U.S. Environmental Protection Agency (EPA) adopted companion greenhouse gas emissions standards for vehicles, matching the stringency of California's vehicle greenhouse gas (GHG) emissions requirements. EPA and the U.S. Department of Transportation are now developing fuel economy and GHG standards for model years 2017 to 2025; a final rule is expected in mid-2012. California is working in tandem with the federal agencies to update its tailpipe GHG standards and continues to be a major force in pushing the national standards to the highest cost-effective level. For this reason, we awarded states that have adopted the California GHG tailpipe emissions standard 2 points. In addition, states offering consumer incentives for the purchase of high-efficiency vehicles earned one point.

In the category of actions to promote non-auto modes of transportation, this year we award a point to states that have adopted "complete streets" laws that ensure proper attention to the needs of pedestrians and cyclists in all road projects. States with relatively high investment in transit ($50 per capita or more) also receive a point.

Because policies to promote compact development and ensure accessibility of major destinations are essential to reduce transportation energy use in the long term, states that have adopted coordinated land use and transportation policies can score up to 2 points. Those adopting targets for vehicle miles traveled statewide are also eligible for 2 points.

Table 13. Results from ACEEE's 2011 Scorecard: State Scoring on Transportation Policies

State	GHG Tailpipe Emissions Standards[a]	Integration of Transportation and Land Use Planning[b]	VMT Targets	Complete Streets Legislation[c]	Transit Funding[d]	High-Efficiency Vehicle Consumer Incentives[e]	Score
Maximum Score	***2***	***2***	***2***	***1***	***1***	***1***	***9***
California	2	1	1	2	1	1	**8**
Maryland	2	2	1	0	1	1	**7**
Massachusetts	2	1	1	2	1	0	**7**
Washington	2	1	0	2	0	1	**6**
Connecticut	2	2	1	0	1	0	**6**
New York	2	1	1	2	0	0	**6**
Oregon	2	1	0	1	1	1	**6**
New Jersey	2	2	1	0	0	0	**5**
Rhode Island	2	2	0	0	1	0	**5**
Florida	2	2	0	0	1	0	**5**
Arizona	2	2	0	0	0	0	**4**
District of Columbia	2	0	1	0	0	1	**4**
Maine	2	2	0	0	0	0	**4**

State	GHG Tailpipe Emissions Standards[a]	Integration of Transportation and Land Use Planning[b]	VMT Targets	Complete Streets Legislation[c]	Transit Funding[d]	High-Efficiency Vehicle Consumer Incentives[e]	Score
Pennsylvania	2	1	1	0	0	0	**4**
Vermont	2	1	0	0	1	0	**4**
Tennessee	0	2	0	0	1	1	**4**
Delaware	0	2	1	0	0	0	**3**
Hawaii	0	1	0	0	1	1	**3**
Illinois	0	1	0	0	1	1	**3**
New Mexico	2	0	0	0	0	0	**2**
Colorado	0	0	0	0	1	1	**2**
Georgia	0	1	0	0	0	1	**2**
Minnesota	0	0	1	0	1	0	**2**
Michigan	0	1	0	0	1	0	**2**
Alaska	0	0	1	0	0	0	**1**
Oklahoma	0	0	0	0	0	1	**1**
Virginia	0	1	0	0	0	0	**1**
Wisconsin	0	0	0	0	1	0	**1**
Utah	0	0	0	0	0	1	**1**
Iowa	0	1	0	0	0	0	**1**
Louisiana	0	0	0	0	0	1	**1**
North Dakota	0	1	0	0	0	0	**1**
West Virginia	0	0	0	0	0	1	**1**
South Carolina	0	0	0	0	0	0	**0**
Alabama	0	0	0	0	0	0	**0**
Arkansas	0	0	0	0	0	0	**0**
Idaho	0	0	0	0	0	0	**0**
Indiana	0	0	0	0	0	0	**0**
Kansas	0	0	0	0	0	0	**0**
Kentucky	0	0	0	0	0	0	**0**
Mississippi	0	0	0	0	0	0	**0**
Missouri	0	0	0	0	0	0	**0**
Montana	0	0	0	0	0	0	**0**
Nebraska	0	0	0	0	0	0	**0**
Nevada	0	0	0	0	0	0	**0**
New Hampshire	0	0	0	0	0	0	**0**
North Carolina	0	0	0	0	0	0	**0**
Ohio	0	0	0	0	0	0	**0**
South Dakota	0	0	0	0	0	0	**0**
Texas	0	0	0	0	0	0	**0**
Wyoming	0	0	0	0	0	0	**0**

[a] Source: Clean Cars Campaign
[b] Source: rankings based on criteria in NRDC (2011)
[c] Source: NCSC (2010)
[d] Source: AASHTO (2010), See Appendix C for a complete ranking of state transit funding.
[e] Source: EERE Alternative Fuel and Advanced Vehicles Data Center

Tailpipe Emission Standards

Vehicles' greenhouse gas (GHG) emissions are largely proportional to their fuel use. In 2002, California passed the Pavley Bill (AB1493), the first U.S. law to address GHG emissions from vehicles. The law required the California Air Resource Board (CARB) to regulate GHG as part of the California Motor Vehicle Program. In 2004, CARB adopted a rule requiring automakers to begin in the 2009 model year (MY) to phase in lower-emitting cars and trucks that will collectively emit 22% fewer greenhouse gases than 2002 vehicles in MY 2012 and 30% fewer in MY 2016. Fourteen states have adopted California's GHG regulations (see Table 14).

The GHG reductions will mainly be achieved through improved vehicle efficiency, so these standards are, to a large degree, energy efficiency policies. Several technologies stand out as providing significant, cost-effective reductions in emissions. Among others, these include the turbocharged engines with direct injection, optimization of valve operation, improved multi-speed transmissions, use of high-strength, lightweight materials, and improved air conditioning systems.

In April 2010, the EPA and the U.S. Department of Transportation (DOT) issued harmonized national standards for fuel economy and greenhouse gas emissions for model years 2012 to 2016. These standards match California's GHG tailpipe standards in stringency and call for a fleet-wide average fuel economy of 34.1 miles per gallon by 2016. States may choose to adopt either the federal vehicle standards or California's.

California has been the leader in clean vehicle standards for decades, pushing the federal government to upgrade standards for both criteria pollutant emissions and GHG emissions from vehicles. Their success in this role is due in part to auto manufacturers' preference for minimizing the number of distinct regulatory regimes for vehicles. DOT and EPA are currently developing fuel economy and greenhouse gas standards for model years 2017 to 2025, and California is once again instrumental in promoting the adoption of the highest feasible efficiency standards. In light of the role of California's standards, adopting states are awarded two points in the transportation energy efficiency scoring.

Table 14. States that Have Adopted California's Tailpipe Emission Standards

State
California
Arizona
Connecticut
District of Columbia
Florida
Massachusetts
Maine
Maryland
New Jersey
New Mexico
New York
Oregon
Pennsylvania
Rhode Island
Vermont
Washington

Source: www.cleancarscampaign.org

Despite the potential energy saving benefits of the California Clean Car program, recent efforts have been made in certain states to repeal the adoption of these more stringent standards. The Arizona Department of Environmental Quality (ADEQ) submitted a proposal in March, 2011 to overturn the program that was adopted in 2008 on the basis that the program is too costly to implement in Arizona

and that the federal standards passed in 2010 are nearly as strict as the California rule. A public hearing on the proposal was held in June and the ADEQ expects to make a decision later this year.

Incentives for High-Efficiency Vehicles

The high cost of advanced technology, fuel-efficient vehicles is a key barrier to their entry into the market place. To encourage consumers to purchase these vehicles, states 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 (AFVs), which typically include vehicles that run on compressed natural gas (CNG), ethanol, propane, or electricity, and in some cases hybrid vehicles (electric or hydraulic). While AFVs can provide substantial environmental benefits by reducing pollution, they do not generally improve vehicle fuel efficiency, and policies to promote their purchase therefore are not necessarily included in our scorecard. However, electric vehicles and hybrids typically do have high fuel efficiency, so incentives for purchase of these vehicles in particular are eligible for one point.[38] With the arrival of the Chevrolet Volt plug-in hybrid sedan and the Nissan Leaf all-electric vehicle, tax credits for electric vehicles are playing an important role in spurring the adoption of high-tech vehicles. States with purchase incentives framed in terms of fuel economy are also awarded a point. Table 15 below outlines the consumer incentives available by state.

A state feebate policy that provides a rebate or charges a fee for the purchase of a vehicle, depending on its fuel efficiency, would also receive credit in our scoring of transportation policies. However, although several states have considered feebates, none have such a policy in place as yet. Incentives for the use of High Occupancy Vehicle (HOV) lanes and preferred parking programs for high efficiency vehicles are not included in our consideration of a state's transportation score, as they may promote driving and consequently bring no net energy benefit.

Table 15. State Purchase Incentives for High-Efficiency Vehicles

State	Tax Incentive
California	AB 118 funds a voucher program, targeted at medium- and heavy-duty trucks, whose goal is to reduce the upfront incremental cost of purchasing a hybrid vehicle. Vouchers range from $20,000 to $40,000, depending on vehicle specifications, and will be paid directly to fleets that purchase hybrid trucks for use within the state. California also offers tax rebates of up to $5,000 for light-duty zero emission electric vehicles and plug-in hybrid electric vehicles on a first come, first serve basis from March 15th, 2010 onwards.
Colorado	In 2009, Colorado extended financial incentives available for purchasers of high-efficiency vehicles out to 2015. Consumers can claim up to $6,000 for the purchase of a plug-in or hybrid vehicle. Individuals that convert a personal vehicle to plug-in hybrid technology can claim up to $7,500.
District of Columbia	The DMV Reform Amendment act of 2004 exempts owners of hybrid electric and electric vehicles from vehicle excise tax and reduces the vehicle registration charge.
Georgia	Purchasers of electric vehicles may qualify for a tax credit equivalent to 10% of the cost of a new vehicle, up to $2,500.
Hawaii	Hawaii's EV Ready Rebate Program provides residents, businesses, government and non-profit agencies with rebates for the purchase of electric vehicles amounting to 20% of the vehicle purchase price, up to $4,500. The program expires on September 30, 2011.
Illinois	Residents of Illinois may claim a rebate for 80% of the incremental

[38] Several early hybrids provided little fuel economy benefit, because the technology was used to increase vehicle power rather than to improve fuel economy. These hybrids did not sell well and have mostly been discontinued, but this issue remains a concern for hybrid incentive programs.

State	Tax Incentive
	cost of purchasing an electric vehicle (up to $4,000) as part of the Illinois Alternative Fuels Rebate Program.
Louisiana	Louisiana offers an income of tax credit equivalent to 50% of the incremental cost of purchasing an electric vehicle under the state's alternative fuel vehicle tax credit program. Alternatively, taxpayers may claim the lesser of 10% of the total cost of the vehicle or $3,000.
Maryland	Purchasers of qualifying all electric and plug-in hybrid electric light-duty vehicles may claim up to $2,000 against the vehicle excise tax in the state of Maryland. Vehicles must meet certain speed, weight and motor requirements to qualify for the program.
Oklahoma	A one-time tax credit for 50% of the incremental cost of purchasing an electric vehicle is available to residents in Oklahoma. The state will provide a tax credit equivalent to 10% of the total purchase price of an electric vehicle (up to $1,500) if the incremental cost of the vehicle cannot be determined. The program expires January 1st, 2015.
Oregon	Oregon residents can claim up to $1,500 in tax credits for the purchase of an HEV or electric vehicle. A tax credit for business owners is also available for the purchase of HEVs and electric vehicles. The tax credit is 35% of the incremental cost of the system or equipment and is taken over five years.
Tennessee	The first 1,000 electric vehicles purchased in the state of Tennessee qualify for a $2,500 rebate from the Tennessee Department of Revenue.
Utah	Prior to December 31st, 2013, electric vehicles qualify for a tax credit equivalent to the lesser of 35% of the vehicle purchase or $2,500.
Washington	Effective from January 2009 through January 2011, the state use tax and retail sales tax do not apply to sales of new passenger cars, light duty trucks, and medium duty passenger vehicles that utilize hybrid technology and have an EPA-estimated highway gasoline mileage rating of at least 40 miles per gallon. Electric vehicles are also exempt from the state sales tax.
West Virginia	Starting on July 1st, 2011, residents of West Virginia are eligible for a tax credit equivalent to 35% of the purchase price of an electric vehicle. Up to $7,500 is available for vehicles that have a Gross Vehicle Weight Rating (GWVR) up to 26,000 lbs. , and as much as $25,000 is available for vehicles having GVWR greater than 26,000 lbs.

Source: DOE (2011b)

State Transit Funding

While states receive some federal funds for public transit, they provide most transit funding from their own budgets. A state's investment in public transit is a key indicator of its interest in promoting energy-efficient modes of transportation, although realizing the potential for energy savings through transit typically requires land use planning changes as well. States that spent a combined $50 or more per capita on public transit in FY 2008 earned one point in the overall transportation scorecard.[39]

[39] See Appendix C for a full table of state transit spending per-capita. We use FY 2008 figures as they are the latest available data for all 50 states and the District of Columbia.

These are: Massachusetts, New York, Maryland, Alaska, New Jersey, Delaware, Pennsylvania, District of Columbia, Connecticut, Minnesota and California.

VMT Reduction Targets

Raising fuel economy and emissions standards will not adequately address transportation sector energy use in the long term if growth in total vehicle miles traveled goes unchecked. U.S. highway VMT is projected to grow 36% by 2030, substantially outpacing population growth in the country (EIA 2011c).Reducing the rate of VMT growth requires the coordination of transportation and land use planning, and state and local governments play more important roles than the federal government does.

Codified VMT reduction targets are an important step towards achieving substantial reductions in VMT. States that have specific targets earn 2 points. Thus far, only three states score the full two points: California, Washington and New York. Oregon is in the process of adopting specific VMT reduction goals and, therefore, earns 1 point.

Integration of Land Use and Transportation Planning Policies

Sound land use planning is vital in order to stem growth in vehicle miles travelled in the United States. Successful strategies for changing land use patterns to reduce the need to drive vary widely among states due to current infrastructure, geography and political structure. However, core principles of smart growth should be embodied in state comprehensive plans. Energy-efficient transportation is inherently tied to the integration of transportation and land use policies, and an approach to planning that successfully addresses land use and transportation considerations simultaneously is critical to state-wide VMT reductions. This approach includes measures that encourage the creation of:

- Transit-oriented development (TOD), including mixed land uses (mix of jobs, stores, and housing) and good street connectivity that makes neighborhoods pedestrian-friendly;
- Areas of compact development;
- Convenient alternative modes of transportation; and
- Activity centers where destinations are close together.

States can earn a maximum of 2 points for the adoption of integrated land use and transportation policies. States with codified growth management acts score 1 point, as do those with smart growth statutes.

Complete Streets Policies

Equally vital to the discussion about land use planning and VMT reduction is the concept of “complete streets.” Complete streets policies focus on the interconnectivity of streets and target safe and easy access to roads by all pedestrians, bicyclists, motorists and public transportation users. States that implement complete streets legislation essentially mandate their transportation agencies to evaluate and incorporate complete streets principles. Transportation planners are tasked with ensuring that all roadway and highway infrastructure projects allow for equitable access and use of those roadways. States that have codified complete streets legislation earn 1 point in our rankings.

Figure 7. Leading States: Transportation Policies

California: As part of its plans to implement AB 32, which requires a 25% reduction from 1990 levels in greenhouse gas emissions by 2020, California has identified several smart growth and VMT reduction strategies. In 2008, the state passed SB 375, which requires the Air Resources Board (ARB) to develop regional transportation-specific greenhouse gas reduction goals, in collaboration with Metropolitan Planning Organizations. These goals must subsequently be reflected by regional transportation plans that create compact, sustainable development across the state and thus reduce VMT growth. ARB released draft targets in June 2010 that recommend a 5–10% reduction in vehicle greenhouse gas emissions by 2020 for the four largest Metropolitan Planning Organizations in the state (ARB 2010a).

California also passed AB 118 in 2009, a clean transportation program that includes funding for a hybrid vehicle rebate program targeted at medium- and heavy-duty vehicles. The goal of the Hybrid Truck and Bus Voucher Incentive Project (HVIP) is to reduce the high upfront costs associated with the purchase of high-efficiency vehicles. The program is currently in its second year. Rebates range from $20,000 to $40,000 per vehicle depending on vehicle specification. California also offers tax rebates of up to $5,000 for light-duty zero emission electric vehicles and plug-in hybrid electric vehicles.

Maryland: Maryland has long been a leader in the implementation of transportation policies. In 1992, the state passed the Economic Growth, Resource Protection and Planning Act as a means to coordinate planning priorities amongst state, regional and municipal government. The act mandates the consideration of conservation practices and transportation in the creation of comprehensive plans.

Maryland's Smart Growth program, initiated in 1997, aims to promote development near transit hubs and other centers of activity. Policies to encourage this development include focusing state spending on existing centers and areas designated for growth, limiting road expansion in favor of public transit and promoting urban redevelopment. In 2001, Maryland state general assembly dedicated $500 million to the upgrade of mass transit service and infrastructure.

Additional transportation policies include the adoption of a tax credit to encourage the deployment of plug-in hybrid and electric vehicles, as well as codification of a complete streets policy to ensure equal access to transportation facilities by all vehicular modes.

***Massachusetts*:** In recent years, Massachusetts has taken several significant steps to improve transportation efficiency within the state. The state's 40-R program, the Smart Growth Zoning Law, provides financial incentives for municipalities to increase density and build affordable housing in areas with good access to transit. The Commonwealth Capital program, initiated in 2005, applies several smart growth criteria to municipalities' applications for state funding.

In 2009, the state implemented language from Chapter 90E, mandating the accommodation of biking and pedestrian traffic in future transportation construction plans. This was quickly followed in 2010 by the GreenDOT directive, which calls on the Department of Transportation (DOT) to reduce in-state transportation greenhouse gasses by 7.3% by 2020 and 12.3% by 2035 from 1990 levels. To achieve these reductions in GHG, DOT will promote alternative modes of transport and support smart growth developments to reduce automobile travel within the state in addition to creating travel demand management programs and providing incentives for efficient fleets and eco-driving.

CHAPTER 3: BUILDING ENERGY CODES

Author: Max Neubauer

Background

Buildings consume 73% of electricity use and 40% of total energy use in the United States, while accounting for 40% of U.S. carbon dioxide emissions (DOE 2008). This makes buildings an essential target for energy savings. However, because buildings have long lifetimes and are not easily retrofitted, it is crucial to target building efficiency measures prior to completing construction. Mandatory building energy codes are one way to target energy efficiency by requiring a minimum level of energy efficiency for new residential and commercial buildings.

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

The most recent versions of the IECC and ASHRAE for which DOE has completed its determination process are the 2009 IECC and the ASHRAE 90.1-2007 standard. While many states have officially adopted the 2009 IECC and/or ASHRAE 90.1-2007, in several states the updated codes will not become effective until late 2011 or beyond. Other states are still in the process of adopting or updating to the more stringent versions.

Requirements in the 2009 IECC are estimated to generate energy savings in residential buildings of 15% above the 2006 IECC (ICF 2009). For commercial buildings, some groups estimate a 4% improvement over the 2006 IECC commercial provisions (SWEEP 2009). The commercial provisions in the IECC, however, consistently differ from those in ASHRAE 90.1, so that the ASHRAE 90.1 standard is generally considered to be more stringent.[40] For example, the latest version of ASHRAE 90.1, which is more commonly used as the standard for commercial buildings than the IECC, is estimated to achieve incremental savings of 8% above ASHRAE 90.1-2004 (PNNL 2009).

The Department of Energy's Building Code Determinations

With the publication of each new edition of the IECC and ASHRAE standards, DOE issues determinations on the codes to ascertain their relative impact when compared to older versions and, if justified, establish the latest iteration as the base code with which all states must comply. While no enforcement mechanism is in place to address non-compliance, states are required to send letters either certifying their compliance, requesting extension, or explaining their decision not to comply within two years of the final determination.

On December July 19, 2011, the DOE issued its final determination on the 2009 IECC, reporting that the 2009 IECC achieves greater energy efficiency than its predecessor editions. DOE estimates that the 2009 IECC achieves 14% greater site energy savings than the 2006 IECC. States must file certification statements with DOE by July 19, 2013.

[40] Some prescriptive measures in the IECC are more rigorous than their ASHRAE equivalent, however. See PNNL (2009) for a detailed comparison of the latest versions.

On July 20, 2011, the DOE issued its final determination on ASHRAE Standard 90.1-2007, reporting that ASHRAE 90.1-2007 achieves greater energy efficiency than its predecessor editions, generating 4.6% more energy savings at site than ASHRAE 90.1-2004. States must file certification statements with DOE by July 20, 2013.

The most recently published versions of the IECC and ASHRAE standards — the 2012 IECC and ASHRAE 90.1-2010 — were published in July 2011. DOE began assessing the relative stringency of the 2012 IECC in November 2010 but has yet to make a preliminary determination. On July 20, 2011, DOE issued a preliminary determination that ASHRAE 90.1-2010 would achieve greater energy efficiency than the 2007 edition.

Building Codes and the American Recovery and Reinvestment Act

The impact of ARRA on building code adoption has shown that federal policy can catalyze tremendous progress among the states. The appropriation of stimulus funding through DOE's State Energy Program (SEP) spurred several dozen states to begin legislative or administrative processes leading to the statewide adoption of the 2009 IECC and ANSI/ASHRAE/IESNA Standard 90.1-2007 (hereafter referred to as the "ARRA codes"[41]). For many states with relatively older codes, the incremental increase in code stringency will be significant and the long-term benefits will far exceed the costs.

States are making progress in their adoption of the latest iterations of these codes. In our *2010 Scorecard*, seventeen (17) states had either adopted or were on a clear path towards the adoption of the ARRA codes for both residential and commercial buildings; and another three (3) had demonstrated progress towards adoption of these codes for either residential or commercial buildings. In this year's *Scorecard*, the number of states that have either adopted or are on a clear path towards the adoption of the ARRA codes for both residential and commercial buildings has increased to twenty-nine (29), while another six (6) have adopted the ARRA codes for either residential or commercial buildings.[42]

ARRA and Building Code Compliance

ARRA also calls for states to achieve 90% compliance with the ARRA minimum standard building energy code (2009 IECC for residential; ASHRAE 90.1-2007 for commercial) by 2017. While some states have made laudable progress in funding and training code officials to ensure enforcement, many will require greater commitment to meet this goal.

To help achieve this goal, the Pacific Northwest National Laboratory (PNNL), which leads the DOE's Building Energy Codes Program (BECP), released a Request for Proposals in August 2010 for states and territories for activities that will facilitate the adoption of and compliance with the most recent building energy codes. A total of $7 million, taken from funding leftover from DOE's State Energy Program (SEP), was awarded to 24 states to engage in a variety of projects, mostly related to code compliance.[43] In addition, a separate source of funding was provided to nine of those states for them to conduct pilot studies on the methodology of measuring compliance, which will include measures of actual compliance rates in each of these states.[44] Other targeted goals of these pilots are: to assist in

[41] In the building energy code community the latest official versions of these codes are referred to as the ARRA codes because of the technical requirement in ARRA to adopt these codes as a prerequisite to dispersal of stimulus funds. Maryland is included in the 29 states, but is the only state that is on track to adopt the 2012 version of the IECC codes.

[42] Two of these six states – Indiana and Virginia – are states that were awarded full credit for residential and commercial buildings in 2010 based on progress they were making towards the adoption of the latest code iterations. These states were docked points relative to their 2010 scores (taking into account the change in our scoring methodology) as the progress that they had shown has stalled or weakening amendments to the codes have been passed.

[43] See http://www.energycodes.gov/arra/documents/StateProjectSummaries.pdf for more details on the specific projects.

[44] For more information on the compliance pilot states, please peruse the following: http://www1.eere.energy.gov/wip/solutioncenter/pdfs/Policies%20and%20Procedures%20for%20Enhancing%20Code%20Compliance.pdf

determining patterns of compliance; to create comprehensive protocols to follow for measuring compliance; and to produce best practices for state building departments to follow when designing training programs.

Utility Involvement in Building Codes

In several states that have passed energy efficiency resource standards (EERS)[45], programs have been established that allow utilities to claim savings for code enhancement activities, both for adoption and compliance. Utilities are in a unique position to assist with state compliance goals, as they offer energy efficiency programs that target building energy efficiency and also collect important data on building energy consumption through utility energy bills. Many utilities across the country offer energy efficiency programs that target improving energy efficiency in new construction specifically, so combining code compliance efforts with efforts to improve energy efficiency beyond code requirements is something that, ideally, would happen concomitantly. For example, utilities can leverage existing relationships with builders and experience measuring savings in new homes.

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

Methodology

For this category, states earned scores on two measures of building energy codes: level of stringency of residential and commercial codes (up to 5 points) and level of efforts to enforce compliance of codes (up to 2 points), for a combined score of up to 7 points.

Our review of state building energy codes is based predominantly on publicly available information such as that provided by the Online Code Environment and Advocacy Network (OCEAN), which maintains maps and state overviews of building energy codes, as well as the DOE's Building Energy Codes Program. The Database for State Incentives for Renewables and Efficiency (DSIRE) also collects and disseminates the status of state energy codes. We assigned each state a score of 0 to 5 for residential and commercial building energy codes, with 5 being assigned to those states exceeding the most stringent codes (see Table 16). We then averaged the two for an overall stringency score (see Table 17). For detailed information on building code stringency in each state, visit ACEEE's State Energy Efficiency Policy Database: http://www.aceee.org/sector/state-policy or see Appendix E.

Because numerous states are still in the process of updating their codes to meet the requirements mandated by ARRA, we awarded full credit to those states that have exhibited progress and show a clear path leading toward the adoption and implementation of the latest versions of the IECC and ASHRAE *within the next year*. In other words, we have not limited qualification to codes that have already become effective, as was the case in our *2008 Scorecard*. However, many states that have begun the process of updating their codes to meet the ARRA requirement have not yet officially adopted the latest IECC and ASHRAE codes 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 17, we denote those states with a clear path toward adoption and implementation with an asterisk and award them full credit. Those states that have begun the adoption process but implementation has either stalled or the

[45] See Chapter 1 on Utility and Public Benefits Programs and Policies.

effective date is uncertain are denoted with a "+" and are awarded credit only for the code versions that are currently effective. Once their efforts have culminated in a clear path toward adoption and implementation of the new codes, the changes will be reflected in future editions of our *Scorecard* and those states will be awarded full credit.

The scoring methodology changes this year to award full credit to states that have introduced state-specific amendments to their building energy codes that render them more stringent than the 2009 IECC and ASHRAE 90.1-2007 or equivalent standards. Given that a handful of states have taken the initiative to improve upon the latest versions of the IECC and ASHRAE 90.1 codes, we believe it is appropriate to reserve them the maximum score. We have also changed the scoring methodology slightly to award credit for states without statewide mandatory building energy codes for various levels of adoptions by major jurisdictions. Many "home rule" states, such as Colorado, Missouri, and Oklahoma, do not have mandatory statewide codes and, instead, adopt and enforce building energy codes at the local level. In these states, some of the local jurisdictions are major urban areas that have adopted the ARRA-level codes and should be given credit for their efforts.

In addition, we also scored states' level of efforts to have builders comply with state building codes. Scoring states on compliance is difficult due to the lack of data—very few states actually collect comprehensive data on residential and commercial compliance with state energy codes. This occurs because states do not typically have enough funding to adequately evaluate the level of compliance within a state. In order to collect information on code compliance and enforcement activities, we distributed a survey to field experts and individuals in each state requesting information regarding their efforts to measure and enforce code compliance, including: (1) published studies that have estimated statewide compliance; (2) enforcement methods; and (3) methods for code official and builder training. States were ranked on a scale of 0 to 2, in 0.5 increments, based on these metrics. States were given 2 points for making substantial efforts in recent years to achieve compliance such as training code officials and funding surveys; 1.5 point for making multiple, but not extensive, efforts; 1 point for some compliance efforts, such as training; 0.5 points for limited efforts; and 0 points for no or unverifiable efforts. See Table 17 for state scores on building energy codes. For more information on state compliance efforts, visit ACEEE's State Energy Efficiency Policy Database: http://www.aceee.org/sector/state-policy or see Appendix F.

Table 16. Scoring Methodology for State Residential and Commercial Building Energy Codes: Stringency

Score	Residential Building Code	Commercial Building Code
5	Exceeds 2009 IECC or equivalent	Exceeds 2009 IECC or ASHRAE 90.1-2007 or equivalent
4	Meets 2009 IECC or equivalent	Meets 2009 IECC or ASHRAE 90.1-2007 or equivalent
3	Meets or Exceeds 2006 IECC or equivalent	Meets or exceeds 2006 IECC or ASHRAE 90.1-2004 or equivalent
2	1998-2003 MEC/IECC (meets EPCA[46]) or significant adoptions in major jurisdictions	1998–2003 IECC or ASHRAE 90.1-1999/2001 or equivalent or significant adoptions in major jurisdictions
1	No mandatory state energy code, but some adoptions in major jurisdictions	No mandatory state energy code, but some adoptions in major jurisdictions
0	No mandatory state energy code or precedes 1998 MEC/IECC (does not meet EPAct of 1992)	No mandatory state energy code or precedes ASHRAE 90.1-1999 or equivalent (does not meet EPAct of 1992)

[46] Under the federal Energy Policy and Conservation Act, states are required to review and adopt the MEC/IECC and the most recent version of ASHRAE Standard 90.1 for which DOE has made a positive determination for energy savings (currently 90.1-2004) or submit to the Secretary of Energy its reason for not doing so.

Note: States that have adopted the 2009 versions of the IECC and ASHRAE 90.1 or are on a clear path toward their adoption within the next twelve (12) months are given full credit.

Table 17. State Residential and Commercial Building Energy Codes: Stringency and Compliance Efforts Scoring

State	Stringency			Compliance Efforts Score	Overall Score
	Residential State Energy Codes	Commercial State Energy Codes	Score (Average)		
California	5	5	5	2	**7**
Massachusetts	5	5	5	2	**7**
Oregon	5	5	5	2	**7**
Washington	5	5	5	2	**7**
Georgia	5	5	5	1.5	**6.5**
Idaho	4	4	4	2	**6**
New York	4	4	4	2	**6**
Florida*	4	4	4	1.5	**5.5**
Utah	3	4	3.5	2	**5.5**
Montana	4	4	4	1.5	**5.5**
District of Columbia	5	4	4.5	1	**5.5**
Connecticut	4	4	4	1.5	**5.5**
New Hampshire	4	4	4	1.5	**5.5**
Maryland	5	5	5	0.5	**5.5**
Virginia	3	4	3.5	1.5	**5**
Iowa	4	4	4	1	**5**
Pennsylvania	4	4	4	1	**5**
Illinois	4	4	4	1	**5**
North Carolina*	4	4	4	1	**5**
Nebraska	4	4	4	1	**5**
Rhode Island	4	4	4	1	**5**
Wisconsin	3	4	3.5	1.5	**5**
Vermont+	4	4	4	1	**5**
Hawaii	4	4	4	1	**5**
Nevada	4	4	4	1	**5**
Kentucky	3	4	3.5	1	**4.5**
Maine	4	4	4	0.5	**4.5**
New Jersey	4	4	4	0.5	**4.5**
Delaware	4	4	4	0.5	**4.5**
Michigan	4	4	4	0.5	**4.5**
Texas	4	4	4	0.5	**4.5**
New Mexico	4	4	4	0.5	**4.5**
Alabama+	4	4	4	0.5	**4.5**
Indiana+	3	4	3.5	0.5	**4**
Ohio	3	4	3.5	0.5	**4**
Minnesota	3	3	3	1	**4**
Louisiana	3	3	3	1	**4**
Tennessee	3	3	3	1	**4**
Colorado	2	2	2	1.5	**3.5**
South Carolina	3	3	3	0	**3**

State	Stringency			Compliance Efforts Score	Overall Score
	Residential State Energy Codes	Commercial State Energy Codes	Score (Average)		
West Virginia	2	2	2	1	**3**
Arizona	2	2	2	1	**3**
Arkansas	2	2	2	0.5	**2.5**
Alaska	4	0	2	0	**2**
Missouri	2	2	2	0	**2**
Kansas	1	1	1	0.5	**1.5**
Oklahoma	1	1	1	0.5	**1.5**
South Dakota	0	0	0	0	**0**
Mississippi	0	0	0	0	**0**
North Dakota	0	0	0	0	**0**
Wyoming	0	0	0	0	**0**

Sources: Stringency scores derived from BCAP (2010) and DOE (2010b), as of September 2010. Compliance and enforcement scores based on information gathered through survey of state building code contacts. See ACEEE's State Energy Efficiency Policy Database for more information on state compliance efforts: http://www.aceee.org/sector/state-policy.

* These states have signed or passed legislation mandating compliance with the 2009 IECC and/or ASHRAE 90.1-2007, effective at a later date, or their rulemaking processes are far enough along that mandatory compliance with the most recent energy codes is imminent. These states are given full credit.

+ These states have signed or passed legislation mandating compliance with the 2009 versions of the IECC or ASHRAE 90.1, but have not demonstrated a clear path forward toward their adoption, so that the effective date remains uncertain. These states are not awarded credit for the 2009 versions of the codes.

California, Oregon, and Washington earned the maximum score of 7 points because their state-developed codes are considered to be more stringent than the highest IECC standards and they have also been estimated to have some of the highest rates of compliance. Massachusetts earns a full 7 points for its solid compliance efforts and its "stretch code", which allows communities to adopt an enhanced version of the 2009 IECC. States that have not adopted a mandatory state energy code, or have poor or unverifiable rates of compliance, earn a score of 0. Currently there are eleven states that do not have statewide, mandatory energy codes for either residential or commercial buildings. The eleven are Alabama, Alaska, Arizona, Colorado, Kansas, Mississippi, Missouri, North and South Dakota, Oklahoma, and Wyoming. Seven states have no verifiable rates of compliance, down from eleven in our *2010 Scorecard*.

Figure 8. Leading States: Building Energy Codes

Nebraska: On August 24, 2011, the Nebraska Energy Code, codified in Nebraska Administrative Code Title 107, will be updated to meet the 2009 IECC and ASHRAE 90.1-2007, respectively. Nebraska's building energy codes had not been updated since 2004, when the 2003 IECC became effective. The update to the most recent versions of the codes was introduced as LB 329 in January 2011 and approved by the Urban Affairs Committee February 25, 2011. The full Nebraska chamber gave final approval on April 8, and the bill was signed by Governor Dave Heineman on April 14. To provide education on the new codes, the Nebraska Energy Office announced a schedule of free training opportunities for the building community. Nebraska is also one of the 24 states that was awarded funding for efforts into augment state energy code compliance. A baseline compliance study is currently underway.

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 2011 Georgia Amendments and is mandatory statewide. The commercial codes also reference ASHRAE 90.1-2007. The state also adopted the 2011 Georgia State Minimum Residential Green Building Standard, based on the 2008 National Green Building Standard (NGBS) with 2011 Georgia Amendments, as an optional code. It is available for local government adoption and enforcement. Georgia is also one of the 24 states that was awarded funding for efforts to augment state energy code compliance and was one of the nine states to receive funding to conduct a compliance pilot study. With the help of this funding, Georgia has been able to bolster its compliance efforts considerably.

CHAPTER 4: COMBINED HEAT AND POWER

Author: Anna Chittum

Combined heat and power 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 or industrial process heating and cooling. CHP systems can save customers money and reduce overall net emissions.

A state could earn up to 5 points based upon its adoption of regulations and policies that encourage the deployment of CHP systems. There are multiple ways in which states can actively encourage or discourage the deployment of CHP. Financial, technical, and regulatory factors all impact the extent to which CHP is deployed. The six factors considered when scoring CHP for the 2011 Scorecard are:

- Standard interconnection rules currently in place
- Status of CHP-friendly standby rates
- Presence of CHP financial incentive programs
- Presence of output-based emissions regulations (OBR)
- Inclusion of CHP/waste heat recovery in a state RPS or EERS or other standard
- Net metering regulations currently in place

Some states are in the process of developing or improving a number of these policies for CHP. Generally, credit was not given for a policy unless it was in place—enacted by a legislative body or promulgated as an order from an agency or regulatory body. Some states that formerly had policies in place have since removed or in other ways nullified these policies; in these situations, we did not give credit for the policy in question. Policies in place as of June 2011 were considered for this review.[47]

The most heavily weighted policy is the presence of an **interconnection standard** that explicitly establishes parameters and procedures for the interconnection of CHP systems. We relied upon secondary sources—such as the *Database for State Incentives for Renewable Energy* (DSIRE 2011) and the Environmental Protection Agency's *CHP Partnership* database (EPA 2011)—as well as primary sources such as public utility commission dockets and interviews with commission staff and utility representatives. Having multiple tiers of interconnection is important to CHP deployment because smaller systems are offered a faster—and often cheaper—path toward interconnection compared to larger systems. Scaling these transaction costs to project size makes economic sense, because customers with larger projects and 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 upon widely accepted technical industry standards, such as the IEEE 1547 standard.[48] Other favorable interconnection practices include the applicability to all utilities, not just investor-owned utilities; a maximum capacity of 10-20 MW or more; the prohibition of redundant external disconnect switches; and the prohibition of additional insurance requirements. Finally, having clearly delineated procedural steps toward

[47] The rankings in this chapter do not reflect the number or size of in-place CHP systems in each state. Nor do they reflect external market factors contributing to CHP deployment such as fuel cost and grid-supplied energy costs. Such elements heavily influence CHP markets, but they are not necessarily representative of state-level CHP policy. Substantial CHP deployment is not always correlated with ideal CHP policies, and similarly a lack of such ideal CHP policies is not always correlated with low levels of CHP deployment. ACEEE's recent report, *Challenges Facing Combined Heat and Power Today: A State-by-State Assessment,* addresses and explores this dichotomy (http://aceee.org/research-report/ie111). In future *Scorecard* reports, ACEEE expects to integrate these additional market forces and CHP deployment figures into its rankings of state CHP policies.

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

interconnection, easily accessible information about the interconnection process and a method by which customers may officially contest a denied interconnection request are all viewed favorably.

Weighted slightly less than interconnection standards are the **standby rates** used by utilities in each state to charge for standby service provided to CHP systems. We relied upon secondary information that came from the Environmental Protection Agency's *CHP Partnership*, as well as primary information from utilities and public utility commissions to score states for this category. Standby rates are generally composed of two elements: energy charges, which reflect the actual standby energy used by a CHP system; and demand charges, which are charges based upon either a single demand peak during a defined period or a specific amount of contracted demand based upon the system's size. Demand charges may often increase significantly based upon a single demand peak during a single 15-minute period. Demand charges can further discourage CHP when a "ratchet" is employed, which maintains the heightened demand charge high for as much as a year or longer.

The next most weighted CHP policy is the presence of **incentives for CHP**. Tax incentives tend to be more permanent than grant programs, which are generally not embedded in state legislation. Tax incentives for CHP take many forms, but are often credits taken against business or real estate taxes. Rebates, grants, bonds, and favorable loan structures are all ways in which CHP can be encouraged at the state level, and the leading states have mixtures of multiple types of incentives. Financial incentives offered through state entities that apply to all CHP systems are preferred, but some credit was also given to incentives for exclusively biomass CHP projects, government *lead by example* CHP programs, and strong utility incentives that encourage CHP development. Additional information on incentives for CHP is available from EPA through its CHP Partnership (EPA 2011) and from the Database for State Incentives for Renewable Energy (DSIRE 2011).

Equal in weight to financial incentives is the presence of **output-based emissions regulations (OBR)**. These are air quality regulations that take the useful energy output of CHP systems into consideration when quantifying a system's criteria pollutant emissions. Many states employ emissions regulations for generators by calculating levels of pollutants based upon the fuel input into a system. For CHP systems, electricity *and* useful thermal outputs are generated from a single fuel input. Therefore, calculating emissions based solely on input ignores the additional power created by the system, using little or no additional fuel. Output-based emissions acknowledge that the additional useful energy output was created in a manner generally cleaner than the separate generation of electricity and thermal energy. Additional information for policies in this category is also available from EPA via its Partnership Web site.[49] New and forthcoming rules from the EPA regulating emissions from multiple sources will dramatically alter the way emissions from some CHP systems are calculated and regulated. State regulatory approaches and programs currently in place that affect the way in which CHP system emissions are regulated may be rendered moot by future EPA activity. Such changes will be reflected in the 2012 Scorecard.

The next most weighted policy used to calculate states' overall CHP scores is the eligibility of **CHP for credit in a renewable portfolio standard (RPS), energy efficiency resource standard (EERS)** or other energy standard. RPS and EERS policies define a particular amount of a state's electric resources that must be derived from renewable energy or energy efficiency resources, respectively, as is discussed in Chapter 1. Most states with RPS or EERS policies set goals for future years. These goals are generally a percentage of total electricity sold that must be derived from renewable or 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 these standards are often paired with financial incentives or support programs to implement and encourage eligible technologies. Thus, when CHP is explicitly listed as eligible for RPS or EERS credit, it creates a large incentive to deploy CHP systems.

The final state policy considered in this chapter is the presence of **net metering** regulations that apply to CHP. Net metering is most commonly applied to renewable energy systems, but can also be

[49] See http://www.epa.gov/chp/state-policy/output.html.

applicable to small combined heat and power (CHP) systems, often those under 1 or 2 MW. Sound net metering regulations allow owners of small distributed generation systems to get credit for excess electricity that they produce on-site. Under net metering rules, distributed generation system owners are compensated for some or all excess generation either at the utility's avoided cost, or, less often, at higher retail rates. The levying of fees on net-metered systems, along with rules that set overly strict limits on individual system and aggregate capacity size, serve as barriers to deployment of CHP and other distributed generation systems. Limits on individual and aggregate system capacities can prevent system owners from installing the most efficient or cost-effective systems, and sometimes even prevent them from meeting on-site load requirements. Any size limits should be based only on objective engineering standards and facility load requirements. Other best practices for net metering include eligibility for all distributed generation technologies, including CHP; eligibility for all customer classes; system size limits that exceed 2 MW; indefinite net excess generation carryover at the utility's retail rate; and prohibition of special fees for net metering.

States are scored for CHP on a scale of 0 to 5 on their efforts to encourage CHP through the above regulatory and financial mechanisms, as listed in Table 18. In addition to absolute rankings of each policy, states are also compared to each other. Consequently, what constitutes an Overall Score of 5 may change slightly each year as the leading states adopt new and novel policies not previously in existence. Similarly, as lagging states raise the floor by adopting new policies, what constitutes an Overall Score of 0 may also change.

Table 18. Scoring Methodology for CHP

Total Score	Overall Score
15 – 20	5
11.25 – 14.75	4
8 – 11	3
6 – 7.75	2
3.25 – 5.75	1
0 – 3	0

Table 19. State Scoring for CHP

State	Inter-connection	Standby Rates	Incentives	OBR	RPS or EERS	Net Metering	Total Score	Overall Score
Maximum Score	***6***	***5***	***4***	***4***	***3***	***2***	***20***	***5***
Maine	6	5	0	4	3	1	19	**5**
Connecticut	6	3	2	3	3	1	18	**5**
Massachusetts	5	1.25	1	4	3	2	16.25	**5**
Ohio	6	1.25	2	3	3	1	16.25	**5**
North Carolina	4	1.25	4	0	3	2	14.25	**4**
Oregon	5	3	3	1	1	1	14	**4**
Illinois	6	2.5	3	0	1	1	13.5	**4**
Pennsylvania	4	2.5	2	0	3	2	13.5	**4**
Texas	5	2.5	0	3	3	0	13.5	**4**
New York	4	1.25	4	2	1	1	13.25	**4**
District of Columbia	6	5	0	0	0	2	13	**4**
New Jersey	3	3	4	1	1	1	13	**4**
Colorado	5	2.5	1	0	3	1	12.5	**4**
Maryland	6	2.5	1	0	1	2	12.5	**4**

State	Inter-connection	Standby Rates	Incentives	OBR	RPS or EERS	Net Metering	Total Score	Overall Score
California	5	3	2	2	0	0	12	**4**
New Mexico	6	0	3	0	1	2	12	**4**
Wisconsin	5	2.5	1	1	1	1	11.5	**4**
Washington	4	1.25	1	2	2	1	11.25	**4**
Utah	6	0	2	0	1	2	11	**3**
Hawaii	2	3.75	1	0	3	1	10.75	**3**
New Hampshire	1	2.5	4	1	1	1	10.5	**3**
Indiana	4	2.5	0	1	1	1	9.5	**3**
Minnesota	5	2.5	0	0	1	1	9.5	**3**
Arizona	0	1.25	3	0	3	2	9.25	**3**
South Dakota	6	1.25	1	0	1	0	9.25	**3**
Vermont	2	1.25	4	0	1	1	9.25	**3**
Delaware	2	2.5	1	3	0	0	8.5	**3**
Rhode Island	1	2.5	2	0	2	1	8.5	**3**
Tennessee	4	1.25	2	0	0	1	8.25	**3**
Michigan	3	0	2	0	2	1	8	**3**
Nevada	1	3	1	0	2	1	8	**3**
Virginia	5	0	1	1	0	1	8	**3**
Florida	3	1.25	1	0	0	2	7.25	**2**
Alaska	1	2.5	3	0	0	0	6.5	**2**
Idaho	0	2.5	3	0	0	1	6.5	**2**
West Virginia	2	2.5	0	0	1	1	6.5	**2**
Iowa	5	0	1	0	0	0	6	**2**
Missouri	1	2.5	0	1	0	1	5.5	**1**
Montana	0	2.5	2	0	1	0	5.5	**1**
Kentucky	1	1.25	2	0	0	1	5.25	**1**
North Dakota	0	1.25	1	0	1	1	4.25	**1**
Kansas	1	0	2	0	0	1	4	**1**
South Carolina	1	0	2	0	0	1	4	**1**
Arkansas	1	1.25	0	0	0	1	3.25	**1**
Mississippi	0	1.25	2	0	0	0	3.25	**1**
Nebraska	1	1.25	0	0	0	1	3.25	**1**
Alabama	0	0	3	0	0	0	3	**0**
Louisiana	1	0	0	0	1	1	3	**0**
Wyoming	0	0	1	0	0	1	2	**0**
Georgia	0	0	1	0	0	0	1	**0**
Oklahoma	0	0	1	0	0	0	1	**0**

While many states saw at least some incremental improvement in CHP policies between 2011 and 2010, several specific policies now in place can be viewed as “game changers,” and as leading examples of CHP-friendly policies. Figure 9 describes the three most notable policies currently in place:

Figure 9. Leading State Policies: Combined Heat & Power

Maine: In 2010, Maine adopted a new interconnection standard applicable to all distributed generation, including all CHP. There are multiple tiers for interconnection, and fixed engineering fees and limited study costs ensure that the cost of interconnection is controlled. This interconnection standard is considered by many to be the best standard currently in place today.

North Carolina: North Carolina's recently adopted tax credit for renewable energy systems offers a 35% credit of the cost of eligible energy property, specifically including CHP systems. The incentive maximum is $2.5 million and there is no cap on the maximum system size. There is also no restriction on system fuel. This incentive is by far the largest state-level tax incentive available for CHP systems.

New Jersey: Though New Jersey does not have an ideal interconnection standard, the practices of its utilities are generally favorable toward CHP systems vis-à-vis interconnection. More significantly, New Jersey recently adopted a rule defining two sites as contiguous if one buys thermal energy from the other. In this way, the seller of thermal energy may also sell electricity to the buyer, utilizing "existing locally franchised public utility electric distribution infrastructure." This electricity may cross public thoroughfares or utility rights-of-way.

CHAPTER 5: STATE GOVERNMENT INITIATIVES

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Background

State legislatures and governors can advance policies and programs that impact utility-sector energy efficiency, transportation efficiency, combined heat and power, and building codes. This chapter, however, is dedicated to the energy efficiency initiatives 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 (Sciortino and Eldridge 2010). In this chapter we focus on three initiatives commonly undertaken by state governments: financial incentive programs for consumers, businesses, and industry; policies and programs to improve the energy efficiency of its facilities and fleets; and research, development, and demonstration (RD&D) activities for energy efficiency technologies and practices.

In light of the wave of energy efficiency funding to the states from the American Recovery and Reinvestment Act (ARRA) and the infrastructure it laid for continuing energy efficiency programs, it is critical to recognize state government initiatives, which play unique roles fostering an energy-efficient economy. State-led programs complement the existing landscape of utility programs, leveraging the state's public and private resources to generate energy and cost savings to the benefit of its customers and taxpayers (Sciortino 2010). Financial incentives offered by state agencies can be a deciding factor for consumers or businesses to invest in energy-efficient technologies or services. "Lead by example" (LBE) policies and programs improve the energy performance of state-owned facilities and fleets, but equally important, these initiatives showcase cost-effective energy efficiency measures to the wider public. State governments can also promote innovative energy efficiency solutions through RD&D initiatives administered by local universities or research centers.

Methodology

States can earn a maximum of 7 points in this category in three categories: (1) financial and information incentives; (2) lead by example (LBE) policies and programs in government buildings and fleets; and (3) research, development, & demonstration (RD&D).

We primarily rely on the *Database of State Incentives for Renewable Energy* (DSIRE 2011) to gather information on current state tax and other financial incentive programs for buildings and equipment efficiency. We also conduct independent, primary research to supplement the financial and information incentive information contained in DSIRE, reviewing state government websites and other online resources provided by the National Governor's Association, the National Association for State Energy Officials, and the Institute for Market Transformation (NGA 2010) (NASEO 2011) (IMT 2011). Points are not given for utility ratepayer-funded financial incentive programs, which are covered in Chapter 1. Programs solely funded by ARRA are not counted (see below). Acceptable sources of funding include state appropriations or bonds, oil overcharge revenues, auction proceeds from the Regional Greenhouse Gas Initiative, and other non-utility ratepayer sources. Tax incentives are also included in the scoring. If a state contributes non-ratepayer funds to a public benefits fund, however, they may earn a point. While there is some overlap of state and ratepayer funding, for example where state RD&D is funded through a systems benefits charge, this chapter is designed to capture energy efficiency initiatives not already covered in Chapter 1.

States earn up to three points for each major incentive program that encourages the purchase of energy-efficient products, which are judged upon their relative strength, customer reach, and impact.[50] Given their broader impact in most cases, for example, tax credits earn a full point, while

[50] "Energy-efficient products" include any product or process that reduces energy consumption. While they may reduce energy consumption, renewable energy technologies such as solar hot water heating are not included because they are typically part

financial incentives offered to a specific customer segment may earn a half-point. States are also given credit for energy use disclosure laws, which require commercial and residential building owners to disclose information about the energy efficiency of their building to prospective buyers, lessees, or lenders. Scoring for disclosure requirements is based on the strength of the policy, and whether both commercial and residential buildings are covered. Experts internal and external to ACEEE vet the financial incentive scores to ensure they represent an accurate representation of financial and information incentives offered in the states.

Our review of state lead by example initiatives is based on information from DSIRE, the Department of Energy Alternative Fuel and Advanced Vehicles Data Center,[51] an information request sent to all the states, and independent research (DOE 2011a). States earn a maximum of 2 points in the LBE category: 0.5 point for energy savings targets in new and existing state buildings; 0.5 point for a benchmarking requirement for public facilities; 0.5 point for robust energy performance savings contracting activities; and 0.5 point for fleet efficiency mandates. Energy savings targets must commit state government facilities to a specific energy reduction goal over a distinct time period. A benchmarking policy refers to a requirement that all buildings undergo an energy audit or have their energy performance tracked using a recognized tool such as EPA ENERGY STAR Portfolio Manager. Robust public-sector energy benchmarking programs may also qualify for the half-point. Scoring on energy performance savings contracting activity is based on three metrics: encouragement, leadership, and resources.[52] For state fleet initiatives, states only earn a point if the plan or policy makes a specific, mandatory requirement for increasing state fleet efficiency. State alternative-fuel vehicle procurement requirements that give a voluntary option to count efficient vehicles are thus not included.

The RD&D review is based on state participation in the Association of State Energy Research Technology and Transfer Institutions (ASERTTI) and the size of effort relative to population as assessed by ACEEE staff. In general, a point is awarded for each major R&D program funded by the state government, including programs administered by state government agencies, public-private partnerships, and university programs dedicated to energy efficiency. A state can receive up to two points in this category. Because funding often fluctuates and it is difficult to determine how much of it supports RD&D specifically focused on energy efficiency, devising a quantitative metric based on RD&D funding is outside the scope of this report. Instead, points are assigned by ACEEE and vetted by outside experts. The review also includes independent research and considers responses from state officials to an information request sent last year on state-level RD&D activities.

of broader renewable energy incentive packages that would not result in energy efficiency gains. This issue will be reviewed in further detail for the 2012 *Scorecard*.

[51] Information request sent to gain primary information on state facility benchmarking policies and programs, as well as energy savings performance contracting activities.

[52] The ESPC **encouragement** metric requires that the state explicitly promotes the usage of ESPCs to improve the energy efficiency of public buildings. The following methods of encouragement were identified and given recognition: statutory requirements for using ESPCs, statutory recommendation of ESPCs as a method of achieving efficiency improvements, explicit preference for ESPCs through statutes, executive orders that explicitly promote or require ESPCs, and/or financial incentives for agencies seeking to use ESPCs. States earning recognition for an ESPC **leadership** were those that have either set up a distinct program that directly coordinates ESPC efforts (and, on occasion, other energy efficiency projects, as well) or housed the state support for ESPCs within a specific state agency that serves as the lead contact for implementing ESPCs in the state. Lastly, the ESPC **resources** category is defined by states that offer documents that help streamline and standardize the ESPC process. Such documents include: a list of prequalified ESCOs, model contracts and other documents, and/or a manual that lays out the procedures required to utilize an ESPC. A state was awarded 0.5 point if it satisfied at least **two of the three** categories described. States were given the opportunity to review information gathered by ACEEE prior to scoring in order to attain maximum accuracy in our research.

Table 20. Summary of Scoring on State Government Initiatives

State	Financial Incentives	Lead by Example	RD&D	Total
Maximum Score	***3***	***2***	***2***	***7***
Massachusetts	2	2	3	7
New York	1.5	2	3	6.5
Oregon	1.5	2	3	6.5
Alaska	1	2	3	6
Colorado	2	1	3	6
Minnesota	2	1	3	6
California	2	2	1.5	5.5
North Carolina	1.5	2	2	5.5
Tennessee	1.5	1	3	5.5
Iowa	1	2	2	5
Michigan	1	2	2	5
Delaware	2	0.5	2	4.5
New Hampshire	1.5	0	3	4.5
Ohio	1.5	1	2	4.5
Maryland	1	0	3	4
Pennsylvania	1	0	3	4
Texas	1.5	1	1.5	4
Connecticut	2	0	1.5	3.5
Hawaii	2	0.5	1	3.5
Illinois	1.5	0.5	1.5	3.5
Indiana	1	0.5	2	3.5
New Jersey	1.5	1	1	3.5
New Mexico	1	1	1.5	3.5
Wisconsin	1.5	2	0	3.5
Florida	1.5	1	0.5	3
Idaho	1	0	2	3
Kentucky	1.5	0	1.5	3
Missouri	1.5	0	1.5	3
Utah	2	0	1	3
Vermont	1.5	0	1.5	3
Virginia	1	1	1	3
Washington	2	0	1	3
Arizona	1.5	0	1	2.5
District of Columbia	1	0	1.5	2.5
Georgia	1	0.5	1	2.5
Louisiana	1	0	1.5	2.5
Maine	1.5	0	1	2.5
Mississippi	1.5	0	1	2.5
Montana	1	0	1.5	2.5
Nebraska	0.5	0	2	2.5
South Carolina	1.5	0	1	2.5
West Virginia	0.5	2	0	2.5
Alabama	1.5	0	0.5	2
Arkansas	1.5	0	0.5	2

State	Financial Incentives	Lead by Example	RD&D	Total
Rhode Island	1.5	0	0.5	2
South Dakota	1	0.5	0.5	2
Kansas	1	0	1	2
Nevada	0.5	0	1	1.5
Oklahoma	0.5	0	1	1.5
Wyoming	0.5	0	1	1.5
North Dakota	0	0	0.5	0.5

The American Recovery and Reinvestment Act and State Governments

The American Recovery and Reinvestment Act passed in February 2009 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 a substantial share went to the states from the Department of Energy's Office of Energy Efficiency and Renewable Energy (EERE), as listed in Table 21.[53] Additional programs that may indirectly fund state and local government programs include the Advanced Research Projects Agency-Energy (ARPA-E), which funds numerous energy efficiency research projects at state universities. Particularly in states minimally served by utility programs, these programs can provide an important first step to introduce consumers and decision-makers to the benefits of energy efficiency programs.

Table 21. ARRA Energy Efficiency Funding to State and Local Governments

Program	FY 2008 Budget	Stimulus Funding
Weatherization Assistance Program	$227 million	$5 billion
State Energy Program	$33 million[54]	$3.1 billion
Energy Efficiency and Conservation Block Grant Program	N/A	$3.2 billion
Appliance Rebate Program	N/A	$300 million
Total	**$260 million**	**$11.6 billion**

While ARRA's main intent was to stimulate rapid job growth, its effects on state-level energy efficiency programs will certainly last 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 states have established 51 revolving loan funds (RLFs) with approximately $650 million in ARRA funds, which could finance approximately $150-200 million per year of energy projects over the next 20 years (Goldman et al. 2011).[55] ARRA also cemented better connections between state energy offices, the Department of Energy and lending institutions, in particular Community Development Financial Institutions (Freehling 2011). 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 (Sciortino 2011). In order to receive and spend Energy Efficiency and Conservation Block Grants, local governments developed knowledge and staff capacity to implement energy efficiency projects, providing solid foundation for future programs.

[53] An additional $15 billion was allocated to programs and projects in which funding could be used for energy efficiency improvements among numerous other modernization or renovation measures.
[54] Required states to contribute funds worth 20% of the DOE grant toward energy projects supported by the grant.
[55] For analysis of the initial implementation phase of energy-related ARRA funding at the state level, see (Goldman et al. 2011).

ARRA-Funded Programs and Scoring

State programs funded solely through ARRA, or any other federal source, do not earn points in the *Scorecard*. Because of the even distribution of the funding, the existence of these programs does not necessarily reflect the efforts of the state, but rather the federal government. Completing an assessment of a state's handling of stimulus funds would rely on fluctuating spending data and rests outside the scope of this report. ACEEE does recognize, however, that some states are implementing these federal funds in an exemplary fashion by creating innovative and effective energy efficiency programs. Some of these examples are presented in a recent ACEEE report (see Sciortino 2010) and many more examples are available through the Department of Energy and National Association of State Energy Officials.[56]

Financial and Information Incentives

Financial incentives are an important instrument to spur the adoption of technologies and practices in homes and businesses. Financial incentives can take many forms: rebates, loans, grants, or bonds for energy-efficient improvements; direct income tax credits for individuals or businesses; exemptions or reduced sales tax on eligible products; and income tax deductions for individuals and businesses. Financial incentives can lower the upfront cost and shorten the payback period of energy-efficiency upgrades, two critical barriers which often impede consumers and businesses from making cost-effective efficiency investments. Incentives also raise consumer awareness of eligible products, encouraging manufacturers and retailers to market these products more actively. As sales increase, prices come down, eventually allowing the products to function in the market without the incentives. Information incentives such as building energy disclosure laws improve consumers' purchasing power by raising awareness of the energy usage of homes and commercial buildings on the market, which can have a significant impact on the economic value of a home or building from a retail perspective. A requirement to disclose a building's energy-use characteristics also provides building owners incentive to improve the energy efficiency of facilities.

Table 22. State Scoring on Major Financial and Information and Incentive Programs

State	Major State Financial Incentives Programs	Score
Alaska	Four loan programs; one rebate program; home energy disclosure policy	3
Maryland	Income Tax Credit For Green Buildings (personal & corporate); four loan programs; grant and rebate programs	3
Massachusetts	Alternative Energy and Energy Conservation Patent Exemption (personal & corporate); grant and rebate programs; home energy disclosure policy	3
Oregon	Residential and business energy tax credit; one grant and two loan programs	3
Pennsylvania	State-led Alternative Energy Fund; six grant and five loan programs	3
Minnesota	Six loan programs	3
New Hampshire	Three loan programs; grants through Greenhouse Gas Reduction Fund	3
Tennessee	Two loan programs; Energy Efficient Schools Initiative (loans and grants); tax credits for energy efficiency businesses	3
New York	Green Building Tax Credit Program (personal & corporate); home energy disclosure policy, rebate programs, and Green Jobs/Green NY loans	3
Delaware	One grant program, loan program, and bond-financed public buildings program	2
North Carolina	One loan and one grant program; three rebate programs	2
Ohio	Advanced Energy Program Grants; one loan program; property tax incentives	2
Idaho	Insulation income tax deduction; one grant program; one low interest energy loan program	2
Michigan	Energy Efficient Home Improvements Tax Credit; grant and loan programs	2
Indiana	Corporate and Personal Energy Savings Tax Credits; two grant programs	2

[56] See the website for the Weatherization & Intergovernmental Programs (http://www1.eere.energy.gov/wip/recovery_act.html) within the Department of Energy's Office of Energy Efficiency and Renewable Energy. Also, see (NASEO 2011).

State	Major State Financial Incentives Programs	Score
Iowa	Iowa Building Energy $mart Program; two grant programs	**2**
Nebraska	Dollar and Energy Savings Loans	**2**
Louisiana	Home Energy Rebate Option; Home Energy Loan Program	**1.5**
Missouri	Tax deduction for home energy efficiency improvements; one loan program	**1.5**
Montana	Energy conservation installation tax credit; tax deduction for energy-conserving investment; one loan program	**1.5**
New Mexico	Sustainable Building Tax Credit (personal & corporate); bond program	**1.5**
Texas	Texas LoanSTAR program; energy efficiency disclosure policy	**1.5**
Vermont	Two loan programs, one grant program	**1.5**
California	One grant program; sales tax exemption for alternative energy manufacturing equipment; energy disclosure policy (commercial)	**1.5**
Connecticut	Two loan programs; sales tax exemption for energy-efficient products	**1.5**
District of Columbia	Energy efficiency disclosure policy (commercial); one rebate program	**1.5**
Illinois	One grant, one loan, one bond program	**1.5**
Kentucky	Energy efficiency tax credits (personal, corporate, and sales)	**1.5**
Nevada	Property tax abatement for green buildings	**1**
Colorado	Loan program for energy efficiency in schools	**1**
Arizona	Property tax exemption for energy-efficient building components	**1**
Georgia	Corporate and Personal Clean Energy Tax Credits	**1**
Hawaii	Home energy disclosure policy in place	**1**
Kansas	Kansas Energy Efficiency Program for Schools (KEEPS); home energy disclosure policy	**1**
Maine	Building disclosure policies (residential and commercial)	**1**
Mississippi	One loan program, one public-sector lease program for efficient equipment	**1**
New Jersey	One loan/grant program, energy efficiency incentive for low-income housing tax credit program (LIHTC Green Point)	**1**
Oklahoma	Three loan programs	**1**
South Carolina	Tax credit for purchase of new energy-efficient manufactured homes; one loan program	**1**
Utah	Two loan funds for state-owned buildings and schools	**1**
Virginia	Energy Leasing Program for state-owned facilities	**1**
Washington	Manufacturing Efficiency Grant Program; energy efficiency disclosure policy	**1**
Wyoming	One loan and one grant program	**1**
Alabama	Loan program for state-owned facilities	**0.5**
Arkansas	Loan program for small businesses	**0.5**
North Dakota	One grant program for public facilities	**0.5**
Rhode Island	RI HEAT loan program	**0.5**
South Dakota	Home energy disclosure policy (new residential)	**0.5**
Florida	One rebate program (expired)	**0.5**
West Virginia	None	**0**
Wisconsin	None	**0**

Source: Database of State Incentives for Renewables and Efficiency (DSIRE 2011)

Note: Utility (ratepayer) funded financial incentives, including those run through public benefits funds and third-party administrators, are included in scoring on utility spending in Chapter 1.

Figure 10. Leading States: State Financial and Information Incentives

Alaska: While the state lacks robust ratepayer-funded energy efficiency programs, 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 small population of Alaska. 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 to provide expert advice and to track savings. On top of the rebate program, the state legislature appropriated $200 million for its Weatherization Assistance Program, bringing total funding in 2008 to $360 million. In 2011, the state appropriated $101.5 million for both the rebate and weatherization programs.

Tennessee: Tennessee has partnered with Pathway Lending to provide low-interest energy efficiency loans to commercial customers. The state also offers energy efficiency loans to local governments and schools. Tax credits are also available for the manufacture of energy-efficient technologies.

The Regional Greenhouse Gas Initiative and Energy Efficiency

The Northeast Regional Greenhouse Gas Initiative (RGGI), which caps greenhouse gas emissions from power plants in ten states, has been a major driver of state-level energy efficiency over the past few years. Through twelve auctions beginning in September 2008, proceeds from allowances sold total $866.4 million. Over half of these proceeds are directed to improve energy efficiency in the states. The funding streams for individual states coming from RGGI proceeds have been large enough to launch new and innovative energy efficiency programs.[57] The clean technology investments funded by RGGI led to an over $1 billion in energy savings and contributed to $2.6 billion in economic growth in the region, according to one study (Kerth and Sargent 2011). Despite the economic and environmental benefits, a handful of states have taken actions to try and pull out of RGGI and one, New Jersey, plans to withdraw January 1, 2012. In May 2011, Governor Chris Christie announced the state would no longer participate in the nation's first cap and trade program (NJ On-Line 2011). Through 2010, New Jersey had invested $29.5 million in twelve energy efficiency and renewable energy projects in the commercial and industrial sectors. A year prior, Governor Christie diverted 44% of the auction proceeds to state budget deficit reduction, an action replicated in New York and New Hampshire, which diverted 31.8% and 11%, respectfully (RGGI 2011).

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 "Leading by Example" (LBE). In the current environment of fiscal austerity, LBE policies and programs are a proven strategy to improve the operational efficiency and economic performance of states' assets. Furthermore, LBE initiatives lower negative environmental and health impacts of high energy use, and promote energy conservation to the broader public.

States commonly adopt policies and comprehensive programs that to reduce energy-use in state buildings. State and local governments operate numerous facilities, including office buildings, public schools, colleges, and universities, and the energy costs to run these facilities can account for as much as 10% of a typical government's annual operating budget (EPA 2009). Only a handful of states have yet to implement 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. The building requirements encourage states to invest in efficient new building

[57] See (RGGI 2011) for full analysis of state energy efficiency programs funded by RGGI.

construction and retrofit projects, lowering energy bills and promoting economic development in the energy services and construction sectors.

Seeking to achieve public-sector energy efficiency goals, states are taking action to implement energy-saving measures through comprehensive programs. Two critical elements of successful public-sector energy efficiency initiatives are proper energy management and institutional support for energy-savings performance contracting (ESPC), both of which help projects overcome information and cost barriers to implementation. Benchmarking energy use in public-sector buildings through tailored or widely available tools such as EPA ENERGY STAR Portfolio Manager ensures a comprehensive set of energy-use data that drives cost-effective energy efficiency investments. If the proper encouragement, leadership, and resources are in place, states can finance energy improvements through Energy Savings Performance Contracts (ESPCs), which allow the state to enter into a performance-based agreement with an Energy Service Company (ESCOs).[58] The contract allows the state to pay the ESCO for its services with money saved from installed energy efficiency measures.[59]

Aside from LBE initiatives in state government buildings, states also pursue efficient vehicle fleet policies to reduce fuel costs and create a hedge against rising fuel prices. State vehicle fleets require a considerable amount of resources, which can be targeted with LBE policies as well. State governments operate fleets of about 500,000 vehicles, ranging from about 1,000 to more than 50,000 per state. In doing so, states incur operation and maintenance costs of about $2.5 billion in total, ranging from $7 million to $250 million (NCFSA 2007). In response to this significant cost, states may adopt a definitive efficiency standard for state vehicle fleets—an optimal tool that ensures a reduction in fuel consumption and greenhouse gas emissions. Other policies may include binding goals to reduce petroleum use by certain amount over a given timeframe, meaningful greenhouse gas reduction targets for fleets, or procurement requirements for hybrid-electric or plug-in electric vehicles. In order to receive credit for the Scorecard, fleet policies must contribute to efficiency improvements that exceed existing Corporate Average Fuel Economy (CAFE) standards.

Table 23. State Scoring on Lead by Example Initiatives

State	Benchmarking Requirements for Public Buildings (0.5 points)	New and Existing State Building Requirements (0.5 point)	Efficient Fleets (0.5 point)	ESPC Policy and Programs (0.5 points)	Score
California	•	•	•	•	**2**
Delaware	•	•	•	•	**2**
Hawaii	•	•	•	•	**2**
Utah	•	•	•	•	**2**
Colorado	•	•	•	•	**2**
Connecticut	•	•	•	•	**2**
Massachusetts	•	•	•	•	**2**
Minnesota	•	•	•	•	**2**
Washington	•	•	•	•	**2**
New Hampshire	•	•		•	**1.5**
Alabama	•		•	•	**1.5**
Arizona	•	•		•	**1.5**
Arkansas	•	•		•	**1.5**
Florida		•	•	•	**1.5**
Maine		•	•	•	**1.5**
Ohio	•	•		•	**1.5**
Rhode Island		•	•	•	**1.5**
Vermont	•	•	•		**1.5**
Illinois		•	•	•	**1.5**

[58] See footnote 23 for how we define ESPC encouragement, leadership, and resources.
[59] 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/

State	Benchmarking Requirements for Public Buildings (0.5 points)	New and Existing State Building Requirements (0.5 point)	Efficient Fleets (0.5 point)	ESPC Policy and Programs (0.5 points)	Score
Kentucky	•	•		•	**1.5**
New Jersey	•	•		•	**1.5**
New York	•	•		•	**1.5**
North Carolina	•	•		•	**1.5**
Oregon	•	•		•	**1.5**
South Carolina	•	•		•	**1.5**
Tennessee	•	•		•	**1.5**
Texas	•	•		•	**1.5**
Wisconsin		•	•	•	**1.5**
Mississippi	•		•	•	**1.5**
Missouri		•	•	•	**1.5**
District of Columbia	•	•			**1**
Iowa	•	•			**1**
Kansas			•	•	**1**
Louisiana		•		•	**1**
Michigan	•	•			**1**
Montana		•		•	**1**
Pennsylvania		•		•	**1**
Virginia		•		•	**1**
Alaska	•	•			**1**
Georgia	•	•			**1**
Idaho		•		•	**1**
Indiana		•		•	**1**
Maryland		•		•	**1**
New Mexico		•		•	**1**
South Dakota	•	•			**1**
Nevada		•			**0.5**
Oklahoma		•			**0.5**
Nebraska	•				**0.5**
West Virginia	•				**0.5**
Wyoming				•	**0.5**
North Dakota					**0**

Figure 11. Leading States: Lead by Example Initiatives

Hawaii: Hawaii's Lead by Example program offers a comprehensive set of services to state agencies. Aggressive policies underpin the program, which include a benchmarking requirement that all state agencies evaluate the energy efficiency in existing buildings of qualifying size and energy characteristics. Each agency must identify opportunities for increased energy efficiency by setting benchmarks for these buildings using ENERGY STAR Portfolio Manager or another similar tool. As a result of Hawaii's LBE program, during fiscal year 2009, total state agency electric consumption dropped 5.8% from 2008 and 2.5% from the baseline year of 2005. It is estimated that the savings in 2009 electricity consumption translated to savings of $10 million in general funds.

Minnesota: Over the past decade, the state of Minnesota has shown its commitment to sustainable buildings by providing leadership, setting high performance standards, and putting forward 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 fleet by 2030, the state offers a complementary benchmarking program for tracking energy use, and the Public Building Enhanced Energy Efficiency Program that aids in the implementation of retrofits. Minnesota also requires on-road vehicles owned by state departments to reduce gasoline consumption by 25% by 2010 and by 50% by 2015. Also, at least 75% of purchases of new on-road vehicles must have fuel efficiency rating that exceeds 30 mpg for city usage and 35 mpg for highway usage.

Research, Development, and Demonstration (RD&D)

Research, development, and demonstration programs drive advancements in energy-efficient technologies and states play a unique role in laying the foundation for such progress. By leveraging resources in the private and public sector, state governments can foster collaborative efforts that achieve the goals of rapidly creating, developing, and commercializing new, energy-efficient technologies.

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

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

Individual state research institutions provide expertise and knowledge to their states from which policymakers can draw in order to advance successful efficiency programs. Through research and development, they also provide the impetus for commercial investment and manufacturing of the new technologies that these institutions conceive. Additionally, these research institutions provide valuable knowledge spillovers to other states through the sharing of information—which is facilitated through membership with ASERTTI, allowing states to benefit from other states' research. States without these institutions can then use this shared information as a roadmap in order to advance their own efficiency programs.

Table 24. State Scoring on RD&D Programs

State	Major RD&D Programs	Score
Alaska	The Cold Climate Housing Research Center, The Alaska Housing Finance Corporation Research Information Center (RIC), and the Emerging Energy Technology Fund	**2**
California	The California Energy Commission's Public Interest Energy Research (PIER)	**2**
Iowa	The Iowa Energy Center	**2**
Massachusetts	Massachusetts Energy Efficiency Partnership (MAEEP), deep energy retrofit and behavioral pilot programs; High Performance Green Building Grants	**2**
Michigan	Michigan NextEnergy Center	**2**
New York	New York State Energy Research and Development Authority (NYSERDA)	**2**
North Carolina	The North Carolina Green Business Fund and NC Solar Center	**2**
Oregon	The Oregon State University Energy Efficiency Center, University of Oregon Energy Studies in Building Laboratory, and The Energy Trust of Oregon	**2**
West Virginia	Energy Efficiency Center of West Virginia and the West Virginia University Building Energy Center	**2**
Wisconsin	Energy Center of Wisconsin and Wisconsin Focus on Energy	**2**
Colorado	Clean Energy SuperClusters at Colorado State University	**1**
Florida	Florida Solar Energy Center	**1**
Minnesota	The Conservation Applied Research & Development (CARD) Fund	**1**
New Jersey	The New Jersey Commission on Science and Technology (CST) administers the Edison Innovation Clean Energy Fund	**1**

New Mexico	The Energy Innovation Fund, managed by the Energy, Minerals and Natural Resources Department	**1**
Ohio	Ohio Air Quality Development Authority (AQDA) Advanced Energy Program Grants and Energy Industries of Ohio	**1**
Tennessee	University of Tennessee partnerships with Oak Ridge National Laboratory and Electric Power Research Institute. Energy efficiency technologies eligible for Tennessee's emerging industry tax credit	**1**
Texas	The Texas A&M Energy Systems Laboratory (ESL)	**1**
Vermont	Efficiency Vermont research studies on cost-effective efficiency opportunities	
Virginia	Modeling and Simulation Center for Collaborative Technology	**1**
Delaware	Two RD&D grant programs run through the Green Energy Fund	**0.5**
Georgia	Funded in part by Georgia Environmental Finance Authority, Southface conducts research and training on energy efficient housing and communities	**0.5**
Hawaii	The Transportation Energy Transformation Program	**0.5**
Illinois	The University of Illinois at Chicago Energy Resources Center	**0.5**
Indiana	The Indiana Office of Energy Development (OED)	**0.5**
South Dakota	South Dakota State University Energy Analysis Laboratory	**0.5**

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

Figure 12. Leading States: State Research, Development, and Demonstration Initiatives

New York: The New York State Energy Research and Development Authority is the epitome of an effective and influential research and development institution. Its RD&D activities are primarily funded through various charges on state ratepayers. The RD&D efforts include a wide range of energy efficiency and renewables programs, organized into seven primary program areas: Energy Resources, Transportation and Power Systems, Energy and Environmental Markets, Industry, Buildings, Transmission and Distribution, and Environmental Research. NYSERDA's 2009/10 RD&D budget was approximately $165 million.

Michigan: The state of Michigan has taken major steps in recent years to re-tool its manufacturing industry and become a hub for the research, development, and demonstration of clean energy technology. A centerpiece to this effort, the Michigan NextEnergy Center hosts laboratories, business incubator space, and other facilities to support the state's alternative energy industry. Energy efficiency and battery storage are central to the NextEnergy Center. As a Renaissance Zone, businesses within the NextEnergy Center may be eligible for tax benefits aside from the numerous tax credits the state offers alternative energy businesses.

CHAPTER 6: APPLIANCE AND EQUIPMENT EFFICIENCY STANDARDS

Author: Max Neubauer

Background

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 usage and energy 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 battery charger may draw a small amount of electricity and waste an even smaller amount. However, with more than 1.7 billion battery chargers in the U.S., the total amount of energy wasted is significant. Real and persistent market barriers, however, inhibit sales of more efficient models. Appliance efficiency standards overcome these barriers by requiring manufacturers to meet minimum efficiency levels for all products, therefore removing the most inefficient products from the market.

States have historically led the way when it comes to establishing standards for appliances and other equipment. California was the first state to introduce appliance standards in 1976. Many states, such as New York and Massachusetts, followed soon after. The federal government did not institute any national standards until 1988 through the passing of the National Appliance Energy Conservation Act of 1987, which created national standards based on those that had been adopted by California and several other states. Congress enacted additional national standards in 1988, 1992, 2005, and 2007. In general, these laws set initial standards for products and require the U.S. Department of Energy to review and strengthen standards on a specific standard. All told, about 45 products are now subject to national efficiency standards.

In February 2009, President Obama signed a Presidential Memorandum that, over the next four years, will require the introduction or update of standards for twenty-six products. To date, DOE has set or updated more than twelve standards and currently has about fifteen rulemakings in progress. 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 just one state – Connecticut – passing standards legislation in 2011.

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 (EPAct) and the Energy Independence and Security Act of 2007 (EISA), states that have set standards prior to federal enactment may enforce their state standards up until the federal standards become effective; states that have not yet set standards are preempted immediately. States that wish to implement their own standard after federal preemption must apply for a waiver; however, states remain free to set standards for any products that are not subject to national standards.

Methodology

Acknowledging the cyclical and changing standards landscape, we lowered the maximum number of points for standards this year from 3 to 2, in light of the fact that most standards (new and updates to existing) are being advanced at the federal rather than the state level. A state can earn up to 2 points for adoption of appliance efficiency standards. We score states based on the potential savings in billion Btus (BBtu) generated through 2030 by appliance efficiency standards not presently preempted by federal standards. The savings estimates, which are based on an analysis by the Appliance Standards Awareness Project (ASAP) and ACEEE (Neubauer et al. 2009), are normalized based on the number of residential customers in the state so that each state is ranked on the amount of

savings generated per customer. Each state earns a score of 0 to 2 in increments of half (0.5) points. See Table 25 for the scoring methodology.

Table 25. 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 26. State Scoring for Appliance Efficiency Standards

States	Energy Savings per Customer through 2030 (BBtu/customer)	Date Most Recent Standards Adopted	Score
California***	122	2010	2
Nevada**	76	2007	2
Connecticut	29	2011	1
Massachusetts*	7.3	2005	1
New York	9.4	2010	0.5
Arizona	7.7	2009	0.5
Oregon	3.1	2007	0.5
Washington	1.2	2009	0.5
District of Columbia	0.6	2009	0.5
Maryland	0.5	2007	0.5
Rhode Island	0.5	2006	0.5
New Hampshire	0.4	2008	0.5
Georgia***	NA	2010	0.5
Vermont	0	2006	0
New Jersey	0	2005	0
Texas***	NA	2010	0

Sources: Neubauer et al. 2009; ASAP website as of September 2011

* Note: In addition to standards enacted in Massachusetts, the state earns a half a point for having developed a waiver of federal standards for gas furnace minimum efficiency.

** Note: Nevada earns half a point for advancing standards for general service incandescent lamps that are more stringent than the federal standards. California would earn an additional half point as well, but it has already been awarded the maximum number of points possible.

***Georgia and Texas passed standards on plumbing products in 2010, as did California in 2007, which include toilets, urinals, faucet aerators, showerheads, and commercial pre-rinse spray valves. However, the CA and TX standards for faucet aerators, showerheads, and spray valves are only as stringent as the existing federal standard and therefore we do not award them credit for energy savings. Georgia's standard exceeds the existing federal standard, but since no analysis has yet been completed measuring the potential savings, we awarded the state half a point assuming that the savings would at least be greater than zero.

California, scoring a maximum of 2 points, continues to take the lead on appliance efficiency standards, most recently adopting the first-ever standards for televisions. Not only has California enacted the greatest number of standards, most other states' standards are based on California's, such as the television standards passed in Connecticut this year. Many of the current state standards have now been included in pending federal legislation; thus, without future state initiative to develop

and implement standards for additional products, the number of state standards preempted by federal standards will likely increase.

It is worth noting that the standards passed 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 treat 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 or so.

Figure 13. Leading States: Appliance and Equipment Efficiency Standards

Connecticut: In January 2011, the Connecticut General Assembly passed Bill 1243, which added standards for compact audio players, televisions, and DVD players and recorders. The standards are based on standards from Title 20 of the California Code of Regulations, making Connecticut only the second state to pass statewide standards on televisions. The standards are set to become effective in January 2014.

***Nevada*:** In June 2007, the Nevada General Assembly adopted Assembly Bill 178, codified as NRS 701.260, establishing standards for general purpose lights sold in the state of Nevada. Beginning January 1, 2012, no general purpose light may be sold in the state unless it produces at least 25 lumens per watt of electricity consumed. This requirement will make the Nevada standard more stringent than the federal standard, precluding a number of bulbs within each wattage category and correlating lumen range from being sold in the state.

CHAPTER 7: MEASURING PERFORMANCE IN STATE ENERGY EFFICIENCY: RESIDENTIAL SECTOR

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Note: Findings from this chapter are not included in the overall state rankings of this report, but rather as an exploratory exercise in measuring energy consumption trends as a means to understanding energy efficiency.

Summary

In this chapter, we present and discuss a methodology for an aggregate, state-level metric of energy consumption intensity (ECI) in the residential sector and provide summary results for each of the 50 states. The methodology identifies changes in state energy consumption intensity (i.e. energy consumption per capita) after adjusting for changes due to year-to-year variations in weather.

This research indicates that it is possible to track trends in state energy consumption intensity, even with the imperfect data sets that are currently available. With improvements in the data collection process, the approach could be further strengthened into a powerful tool for evaluating states' progress in reducing energy consumption.

Acknowledgements

This chapter is the result of an analysis completed by the authors and commissioned by the Center for Market Innovation at the Natural Resources Defense Council. A detailed report about a performance based state energy efficiency metric that could be used to increase transparency and accountability of energy efficiency performance among states and potentially to reward states for improved performance can be downloaded at the following Web site: http://www.schatzlab.org/projects/psep.

Measuring Performance

Our approach for tracking energy consumption intensity (ECI) is based upon per capita energy consumption data for the residential sector in each state over a period of 10 years. We use the results of a regression analysis to adjust ECI in a given year for changes in residential heating and cooling energy use due to annual variations in state weather. We call this corrected value the adjusted energy consumption intensity (aECI). In order to evaluate a state's performance in reducing aECI, we estimate the slope of a linear trend through the ten years including the test year and the nine preceding years. States with a downward (negative) slope are considered to have achieved progress, while those with a flat or increasing slope are not. The following section, "Methodological Approach", describes this methodology in further detail.

Table 29 presents a ranking of states based on the slope of aECI for the four most recent periods for which data are available (1997-2006, 1998-2007, 1999-2008, 2000-2009). When the ten-year slope of aECI is recalculated on an annual basis, there is considerable overlap from period to period in the data used to create the metric. The four periods shown in Table 29 illustrate the variability and evolution of states' performance year over year.

Table 29. Ten-Year Slopes of aECI from 1997-2006, 1998-2007, 1999-2008, and 2000-2009

	2006		2007		2008		2009	
Rank	**State**	**Slope**	**State**	**Slope**	**State**	**Slope**	**State**	**Slope**
1	WA	-0.27	WA	-0.37	MA	-0.53	MA	-0.76
2	CA	-0.19	MA	-0.31	WA	-0.52	WA	-0.56
3	UT	-0.08	CA	-0.20	TX	-0.35	TX	-0.56
4	IL	-0.02	TX	-0.18	OR	-0.26	MI	-0.54
5	TX	0.01	OR	-0.11	NY	-0.19	NY	-0.46
6	OR	0.02	UT	-0.05	RI	-0.19	RI	-0.44
7	MA	0.07	KS	-0.03	UT	-0.17	CT	-0.40
8	NY	0.15	IL	-0.02	MI	-0.16	DE	-0.38
9	SD	0.16	NY	0.00	CA	-0.16	ME	-0.33
10	NE	0.18	RI	0.00	IL	-0.09	PA	-0.32
11	RI	0.19	NH	0.03	MD	-0.07	OR	-0.32
12	NJ	0.20	NE	0.08	KS	-0.04	MD	-0.31
13	NV	0.21	MD	0.13	NE	-0.03	GA	-0.28
14	HI	0.23	MI	0.18	DE	-0.01	IL	-0.27
15	KS	0.25	NJ	0.20	CT	0.01	AK	-0.24
16	MD	0.26	SD	0.20	NH	0.03	NE	-0.21
17	IA	0.28	NV	0.22	AK	0.04	NH	-0.20
18	OH	0.35	HI	0.23	PA	0.04	UT	-0.18
19	NH	0.36	IA	0.25	NJ	0.05	MN	-0.18
20	LA	0.37	GA	0.28	NV	0.07	NJ	-0.11
21	MI	0.40	MS	0.28	GA	0.08	AL	-0.11
22	NC	0.43	LA	0.29	MN	0.12	MS	-0.10
23	SC	0.44	SC	0.30	MS	0.12	NC	-0.07
24	IN	0.46	NC	0.31	SC	0.15	NV	-0.07
25	PA	0.47	PA	0.34	NC	0.16	CA	-0.06
26	GA	0.47	OH	0.34	AL	0.17	WI	-0.05
27	TN	0.47	OK	0.36	OH	0.18	SC	-0.05
28	AZ	0.49	DE	0.36	IA	0.18	OH	-0.03
29	OK	0.50	AL	0.36	LA	0.19	FL	-0.03
30	MS	0.51	TN	0.37	SD	0.20	CO	0.00
31	AR	0.52	AR	0.38	ME	0.21	KS	0.01
32	MN	0.55	FL	0.42	FL	0.23	TN	0.03
33	KY	0.60	MN	0.42	AR	0.24	IN	0.09
34	AL	0.60	AZ	0.43	WI	0.24	LA	0.12
35	FL	0.61	WI	0.45	HI	0.25	AR	0.13
36	ID	0.61	IN	0.46	TN	0.26	OK	0.16
37	WI	0.62	CT	0.52	CO	0.29	IA	0.19
38	MO	0.66	ME	0.55	IN	0.33	VA	0.23
39	VA	0.67	CO	0.56	AZ	0.36	AZ	0.24
40	AK	0.69	KY	0.60	OK	0.36	SD	0.24
41	CO	0.70	AK	0.61	KY	0.44	KY	0.24
42	DE	0.71	MO	0.63	VA	0.49	HI	0.33
43	NM	0.76	VA	0.66	MO	0.56	MO	0.34
44	CT	0.83	ID	0.69	ID	0.64	VT	0.44
45	VT	0.97	VT	0.74	VT	0.65	ID	0.61
46	ME	1.07	NM	0.76	NM	0.70	NM	0.69
47	WY	1.11	ND	1.32	ND	1.07	ND	0.81
48	MT	1.22	WY	1.37	WY	1.41	WV	1.23
49	ND	1.35	WV	1.57	WV	1.48	WY	1.33
50	WV	1.47	MT	1.58	MT	1.60	MT	1.57

Figure 13 presents a graphical display of the results from 2000-2009. This metric allows the ranking of states to be based upon recent reductions in their aECI. In other words, states are rated relative to their own baseline; this approach gives every state the opportunity to rise in the rankings.

Figure 13. Ten-Year Slope of Adjusted ECI from 2000-2009 for U.S. States

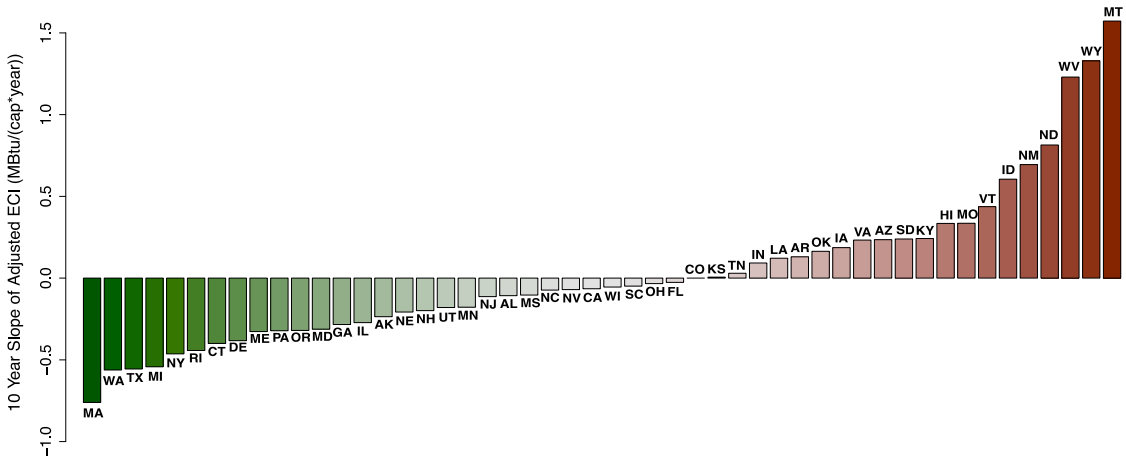
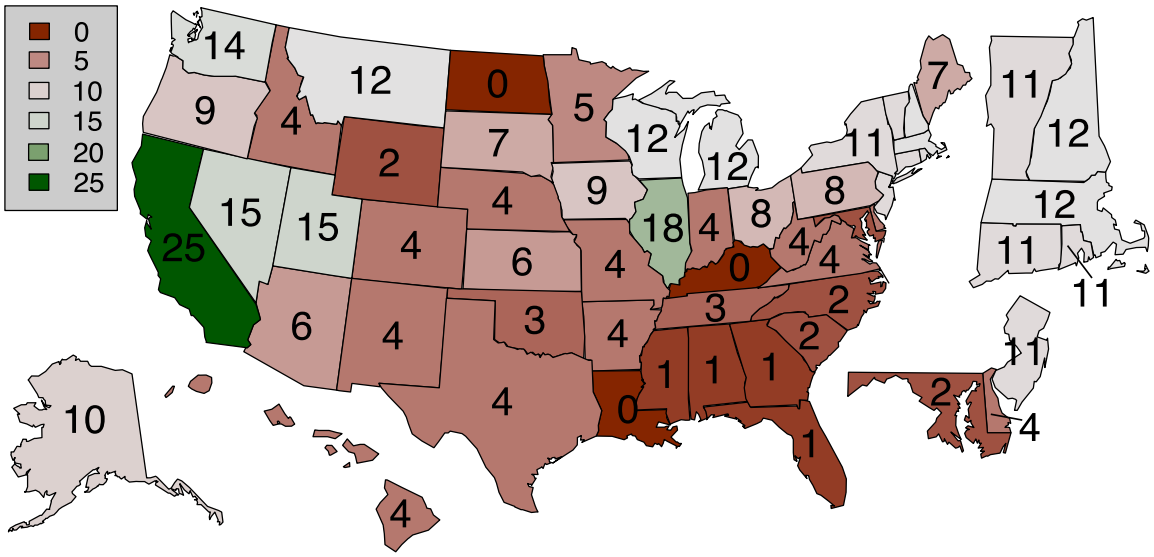


Figure 14 summarizes the historical performance of the states when this metric is applied to the twenty five ten-year periods from 1976-1985 to 2000-2009; it presents the total number of years in which the ten-year slope of aECI was negative for each state. The states with the largest number of negative slopes are the ones that have consistently decreased their aECI over the time period.

Figure 14. Summary of the Number of 10-year Periods from 1985-2009 in which the Slope of aECI was Negative



Methodological Approach

The approach that we employ for tracking ECI begins with aggregate energy consumption data for the residential sector in each state over a period of 10 years.[60] These data are adjusted according to state population, yielding annual per capita residential energy consumption intensity (MBtu/capita/year). The data are also corrected for an unrealistic assumption made by the EIA that primary energy associated with electricity consumption should be estimated using a national averaged fossil fueled heat rate. Our analysis estimates a state specific heat rate based on the composition of electricity production, which assumes no conversion losses from renewable electricity,[61] hydropower, and nuclear power.[62]

While there are many causes for variation in energy consumption intensity, weather is most clearly beyond the influence of policy makers[63]. Therefore, adjusting for this factor is an important step in the evaluation of consumption trends that result from policy changes. We perform a fixed effect multiple linear regression to determine the response of ECI to heating and cooling degree days (HDD and CDD), both strong indicators of the impact of climate on building energy consumption. The regression includes dummy coefficients to model the fixed differences in ECI from state to state as well as differences from year to year across all states. The estimated weather coefficients are used to adjust ECI in a given year to a normal weather year based on the state's 30-year average HDD and CDD values.[64]

The result is an adjusted residential sector ECI (hereafter called "aECI") time series for each state that includes corrections for changes in residential heating and cooling energy use due to annual variations in state weather. In order to evaluate a state's performance in reducing aECI, we estimate the slope of a linear trend line through the ten years including the test year and the nine preceding years. The PSEP score for the year equals this slope. States with a downward (negative) slope, which indicates a decrease in aECI, are considered to have achieved progress, while those with a flat or increasing slope are not.[65]

The performance based metric for evaluating states' progress that is described in this chapter differs from the ACEEE scorecard for state energy efficiency policy in some important ways. First, there are differences in the sectors that are currently covered by the respective approaches. For instance, the ACEEE scorecard includes an evaluation of residential, commercial, and transportation sector policies, while the performance based metric presented here focuses exclusively on the residential sector. Additionally, while the ACEEE scorecard gives credit to states immediately for enacting efficiency oriented policies, a performance based approach gives credit only after those policies have delivered results in terms of reductions in energy consumption intensity over time. As a result, there is an inherent time lag between policy and performance based evaluation approaches. Moreover, with a performance based approach states will not receive credit for enacting efficiency oriented policies unless those policies result in measurable reductions in weather adjusted energy

[60] The energy data are from the Energy Information Agency of the U.S. Department of Energy's State Energy Data System (SEDS). Population data are from census and annual intercensal estimates from the U.S. Department of Commerce, Bureau of the Census.

[61] We treat the following as renewable sources of electricity: wind, solar, wood, geothermal, municipal waste.

[62] Because the grid mix in each state changes from year to year, the heat rate estimate also changes. However, we seek to separate the impact on consumption of energy efficiency measures from changes in grid mix or conversion efficiency. To address this issue, we use a constant state-specific heat rate for any given evaluation period. For example, if our metric is concerned with ECI trends in California for the period 2000-2009, then we use the average heat rate over that period to make the adjustment to primary energy associated with electricity consumption.

[63] Other factors typically used in this kind of analysis include economic indicators and the price of energy. See the section below titled "PSEP vs. Other Econometric Approaches" for further discussion of our decision not to adjust for these factors.

[64] State level, population weighted HDD and CDD values are not currently published for Alaska and Hawaii by the NDCD. Our methodology for estimating these values from 1975-2008 is described in Appendix D of our broader report: http://www.schatzlab.org/projects/psep/psep.php

[65] It is also possible to add the condition that the slope estimate for a given test period be negative with some level of confidence. This can decrease the occurrence of false positives, that is, exclude states that actually made no improvement in aECI from our definition of progress. In our broader report, we apply such a hypothesis test at the 80% significance level.

consumption intensity. Finally, as described in more detail in the "Key Conclusions" section below, the data currently reported for energy consumption by state are not perfect. This may influence some of the results in the current assessment of performance based results. As a result of these differences, it is not surprising that in some cases, states' rankings under the performance metric presented in this chapter do not match those in the ACEEE scorecard. Importantly, the approaches can be used to complement each other, as one is a measure of state energy efficiency policy while the other is a measure of progress in achieving reductions in energy consumption intensity.

Notable Results

Some of the results presented above are especially notable, including the nationwide trend toward better (more negative) PSEP scores, as well as the particular performance of a few individual states.

From 2006 through 2009, the general trend in the PSEP metric has been toward lower scores, or better overall performance. As can be seen in Table 29, the number of states with negative PSEP scores increases from 4 to 29. One might conclude that these reductions in consumption can be attributed to the recent economic downturn. Indeed, in 2008 and 2009, residential aECI has generally decreased from its 2007 value for most states. However, this change is never precipitous or outside the bounds of normal variability.

Additionally, we conducted an experiment to see if including an economic indicator as a correction factor in the ECI adjustment would change the results. When real household disposable income is used in addition to heating and cooling degree days to adjust residential ECI, the resulting PSEP metric shows an almost identical overall downward trend across all states between 2006 and 2009. We believe that the observed trend is primarily a result of other effects, such as state and national efficiency policies, the price of energy, and/or structural changes in the residential sector.

The states of Connecticut, Maine, and Delaware stand out as states that have demonstrated dramatic improvements in both their PSEP score as well as their ranking amongst the 50 states from 2006 to 2009. Similar to the nationwide trend toward better performance, these results are most likely attributable to state level policies (Connecticut and Maine rank high by their ACEEE scores) as well as price spikes (the sharp rise in petroleum prices has coincided with a steep reduction in the consumption of fuel oil for home heating in all three states) and, to a lesser extent, the 2008 recession.

Finally, it should be noted that California has fallen in its PSEP rankings from second place in 2006 to twenty-fifth in 2009. This drop is partially due to a flattening of California's aECI trend, which may indicate that many of the low-cost efficiency opportunities have already been realized in California's residential sector.[66] However, most of the drop in rank can be explained by successes in other states catching up to and exceeding California's recent performance.

PSEP vs. Other Econometric Approaches

Other econometric approaches commonly cited in academic and policy literature (see Bernstein et al., 2003; Loughran and Kulick, 2004; Horowitz, 2011) focus on quantifying the impact of specific policies (or groups of policies) on energy consumption. They are usually based upon a regression analysis which includes all relevant explanatory variables that are completely (or mostly) policy-independent (e.g. energy prices as well as economic and demographic indicators). The technical approach involves comparing the actual consumption trends to a *counterfactual*, or a prediction of what the trend would have been in the absence of policies or other factors not accounted for in the regression model. While this approach can be used successfully to discern the impact of specific policies, the general applicability of the scheme is somewhat limited.

[66] The authors of this Chapter conducted a detailed analysis of California's residential sector energy consumption and efficiency policy history, see the California Ground Truth Analysis report at:
http://www.schatzlab.org/projects/psep/psep.php

The problem lies in the fact that a counterfactual model must be estimated from a time period before the introduction of the policy, while the evaluation of performance must occur in the time period after implementation. With careful application, this can be done for specific policy regimes within individual states or even across states with very similar policies and timelines, but it would be very difficult – if not impossible – to apply this methodology in a consistent manner to all 50 states *every* year due to the cacophony of policies that come and go over time, many of which have overlapping influence on energy consumption. So while the counterfactual approach is admittedly more discerning than the PSEP metric, the approach should be seen as a solution to a different set of objectives.

The PSEP metric was developed with the primary objective of instigating a national dialogue about tracking energy efficiency performance at the state level. The technical approach was designed to be all-inclusive. Changes in energy consumption occur for a multitude of reasons, but only those that are totally beyond the influence of state policymakers (i.e. weather) are controlled for in the analysis. Other factors (in particular, energy prices as well as economic and demographic indicators) are not a part of the correction process. The following sections discuss the rationales for these choices in more detail.

Energy Prices

It is well known that consumers often respond to price signals by using less energy when prices are high and more when they are low. It is unsurprising, therefore, that Bernstein et al. (2003) and others have observed a significant correlation between residential energy consumption and the logarithm of electricity and natural gas prices.

While this may suggest that the ECI values should be adjusted for year-to-year variations in electricity, natural gas, and other associated prices, PSEP does not make this adjustment because it might negate state efforts to reduce residential energy consumption by means of tiered billing that involves higher rates for higher levels of consumption. Although changes in prices due to other 'non-policy' related factors (e.g., speculation in the market, interruptions in supply, actual resource constraints, etc.) would also cause variation in energy consumption, it is difficult to separate these price effects from policy induced price changes. With all of this in mind, the question of whether adjustments should be made for variations due either to regulatory-induced or market-induced changes in prices is an important one. Because of this, we decided against making such adjustments, since policy driven price variation provides a natural and powerful tool to produce reductions in residential energy intensity.

Economic Factors

Bernstein et al. (2003) observed strong sensitivity in residential energy consumption per capita to various demographic and economic factors such as the logarithms of average household size, real disposable income per capita, and employment per capita.

State employment and disposable income are not factors that states can easily manipulate to reduce energy consumption. As such, they are reasonable candidates for factors with which to adjust year-to-year energy consumption. However, we question whether increases in consumption that are due to increases in disposable income should be excluded from a state's performance indicator. Why reward some states for a temporary economic boom if they are actually increasing their per capita energy consumption? Moreover, a decrease in energy consumption that accompanies an economic downturn may be unintentional, but it still represents a decrease, however temporary. States that do not have an effective set of energy efficiency programs or policies in place would not be well positioned to sustain reductions, so any "unearned" recognition would be short lived. Further, adding adjustments for disposable income provided only modest improvements in explaining the year-to-year variation in state ECI. For these reasons, we ultimately chose not to adjust for disposable income or any other economic factor.

Key Considerations and Conclusions

The analyses that we have conducted indicate that it is possible to track trends in residential ECI by state. Although ECI trends can be tracked, the method, by design, does not isolate changes in ECI that are solely due to policy choices from changes due to other factors. However, while we were not able to explain all of the year-to-year variability in the ECI with this approach, including additional policy independent variables (e.g. disposable income, percent employment, GDP by state, etc.) did not dramatically improve the results. Therefore, while no metric can isolate changes due to policy with 100% reliability, we believe this methodology is a reasonable approach to gauge policy impacts over the long term. Notably, a preliminary analysis of commercial sector data indicates that it may be possible to extend the use of the performance based ECI metric to the commercial sector, although access to improved data would be required to achieve this.

Almost all of the data used in the analyses in this report are from the EIA State Energy Data System (SEDS). The data for SEDS are self-reported by utilities and electric power generating plants, and the sectoral classifications (i.e., residential, commercial, etc.) are based on the supplier classification of accounts and may vary by supplier, by state, and by year. In order to more accurately track state level trends in energy efficiency, we recommend the following improvements in data collection and reporting:

1. Standardize and Disaggregate SEDS Classification System: For ideal implementation of the proposed program, the classification system associated with SEDS should be standardized across all states and suppliers.
2. Quarterly Energy Consumption and HDD/CDD Data: If quarterly, not just annual, energy consumption data were available the statistical power of the proposed analysis would be increased substantially.
3. Implement System to Improve Reliability of Data reported through SEDS: assessing and improving the reliability of the self reported data from utilities and electric power generating plants is important to accurately tracking consumption trends and ultimately designing effective energy efficiency policies and programs.
4. Population Weight HDD and CDD using Current Year Populations: Currently, HDD and CDD values are weighted by the decennial census population data, this should be changed to use annual population estimates.
5. Publish Population Weighted HDD and CDD for the states of Alaska and Hawaii: Currently, the NCDC do not make estimates of annual HDD and CDD available for these states. While stand-in estimates can be made based on available data, the NCDC should include these states in their product to ensure that a consistent methodology is used.
6. Publish Consumption-Based Grid Mix Data: Estimating the mix of generation types on the electricity grid would ideally be based on electricity consumption in each state rather than on energy production. The current SEDS data only allow for production-based estimates for each state, with no accounting for imports and exports.
7. Establish Clear Leadership and Coordination across Agencies: At present, the data required for this analysis are collected by a wide range of agencies, including the EIA, NCDC, and Census Bureau. All of the contributing agencies should explicitly be made responsible for providing their portion of the data on a timely basis and should be funded so they can do so.
8. Improve Timeliness of Data Reporting: For the state energy consumption tracking system to be effective and have its desired influence, the interval between the end of the reporting period and the release of the tracking results should be as brief as practical (e.g., 6-12 months).

To successfully implement these changes, the EIA and other agencies will require modest funding increases in order to cover costs associated with additional data collection and processing.

CHAPTER 8: DISCUSSION OF SCORECARD RESULTS

The results of the *Scorecard* are presented again in Table 30 and the last column shows the state's change in ranking compared to the *2010 Scorecard*. Readers should note an important caveat: changes in state rankings are due to *both* changes in the scoring methodology as well as changes in state efficiency programs and policies. We present here some key highlights on changes in state rankings, discuss the notable states making new commitments to energy efficiency over the past year, and suggest further areas of research for future editions of the *Scorecard.*

Table 30. Summary of Overall State Scoring on Energy Efficiency

Rank	State	Utility and Public Benefits Fund Efficiency Programs and Policies Score	Transportation Score	Building Energy Code Score	Combined Heat and Power Score	State Government Initiatives Score	Appliance Efficiency Standards Score	Total Score	Change in Rank from 2010	Change in Score from 2010
Maximum Possible Points:		*20*	*9*	*7*	*5*	*7*	*2*	*50*		
1	Massachusetts	18.5	7	7	5	7	1	45.5	1	3
2	California	17.5	8	7	4	5.5	2	44	-1	-1.5
3	New York	15	6	6	4	6.5	0.5	38	1	3.5
4	Oregon	13.5	6	7	4	6.5	0.5	37.5	-1	0.5
*5	Vermont	19	4	5	3	3	0	34	0	1
*5	Washington	13.5	6	7	4	3	0.5	34	1	2
*5	Rhode Island	18.5	5	5	3	2	0.5	34	2	5
*8	Minnesota	18	2	4	3	6	0	33	0	5
*8	Connecticut	12	6	5.5	5	3.5	1	33	0	5
↑10	Maryland	9.5	7	5.5	4	4	0.5	30.5	6	6.5
11	Iowa	14	1	5	2	5	0	27	1	2.5
*12	Maine	10.5	4	4.5	5	2.5	0	26.5	-2	-0.5
*12	Hawaii	12	3	5	3	3.5	0	26.5	0	2
*12	Colorado	11	2	3.5	4	6	0	26.5	7	4.5
15	New Jersey	8.5	5	4.5	4	3.5	0	25.5	-3	1
16	Wisconsin	11.5	1	5	4	3.5	0	25	-5	-1
*17	Utah	12	1	5.5	3	3	0	24.5	-5	0
↑*17	Illinois	9	3	5	4	3.5	0	24.5	8	6
↑*17	Michigan	10	2	4.5	3	5	0	24.5	10	7
*17	Arizona	11.5	4	3	3	2.5	0.5	24.5	1	1.5
21	New Hampshire	10.5	0	5.5	3	4.5	0.5	24	1	2.5
*22	Nevada	11.5	0	5	3	1.5	1.5	22.5	-3	0.5
*22	District of Columbia	6	4	5.5	4	2.5	0.5	22.5	-3	0.5
24	Ohio	8.5	0	4	5	4.5	0	22	3	4.5
25	Pennsylvania	4	4	5	4	4	0	21	-9	-3
26	Idaho	9	0	6	2	3	0	20	0	2
*27	Florida	3.5	5	5.5	2	3	0	19	3	2
*27	North Carolina	4.5	0	5	4	5.5	0	19	-3	-1
*27	New Mexico	5	2	4.5	4	3.5	0	19	-5	-2.5
↑30	Tennessee	2	4	4	3	5.5	0	18.5	5	7.5
31	Delaware	2.5	3	4.5	3	4.5	0	17.5	-4	0
32	Indiana	6.5	0	4	3	3.5	0	17	-1	0.5

Rank	State	Utility and Public Benefits Fund Efficiency Programs and Policies Score	Transportation Score	Building Energy Code Score	Combined Heat and Power Score	State Government Initiatives Score	Appliance Efficiency Standards Score	Total Score	Change in Rank from 2010	Change in Score from 2010
33	Texas	3	0	4.5	4	4	0	15.5	-1	1
34	Virginia	2	1	5	3	3	0	14	0	2.5
35	Montana	4.5	0	5.5	1	2.5	0	13.5	-2	-0.5
36	Georgia	1.5	2	6.5	0	2.5	0.5	13	1	3
37	Kentucky	3.5	0	4.5	1	3	0	12	-1	1.5
*38	Alaska	0	1	2	2	6	0	11	-1	1
*38	Arkansas	5.5	0	2.5	1	2	0	11	3	3.5
↑40	Nebraska	1.5	0	5	1	2.5	0	10	7	6
40	Louisiana	2.5	1	4	0	2.5	0	10	2	3
42	South Dakota	4.5	0	0	3	2	0	9.5	-3	0
↑43	Alabama	2.5	0	4.5	0	2	0	9	6	6
*44	Missouri	2.5	0	2	1	3	0	8.5	-1	2.5
*44	West Virginia	0	1	3	2	2.5	0	8.5	-1	2.5
46	South Carolina	1.5	0	3	1	2.5	0	8	-6	-0.5
47	Oklahoma	2.5	1	1.5	0	1.5	0	6.5	-4	0.5
48	Kansas	1	0	1.5	1	2	0	5.5	-2	0.5
49	Mississippi	0.5	0	0	1	2.5	0	4	1	2
50	Wyoming	2	0	0	0	1.5	0	3.5	-2	0
51	North Dakota	0	1	0	1	0.5	0	2.5	0	1

Notes: ↑ denotes "most improved" states.

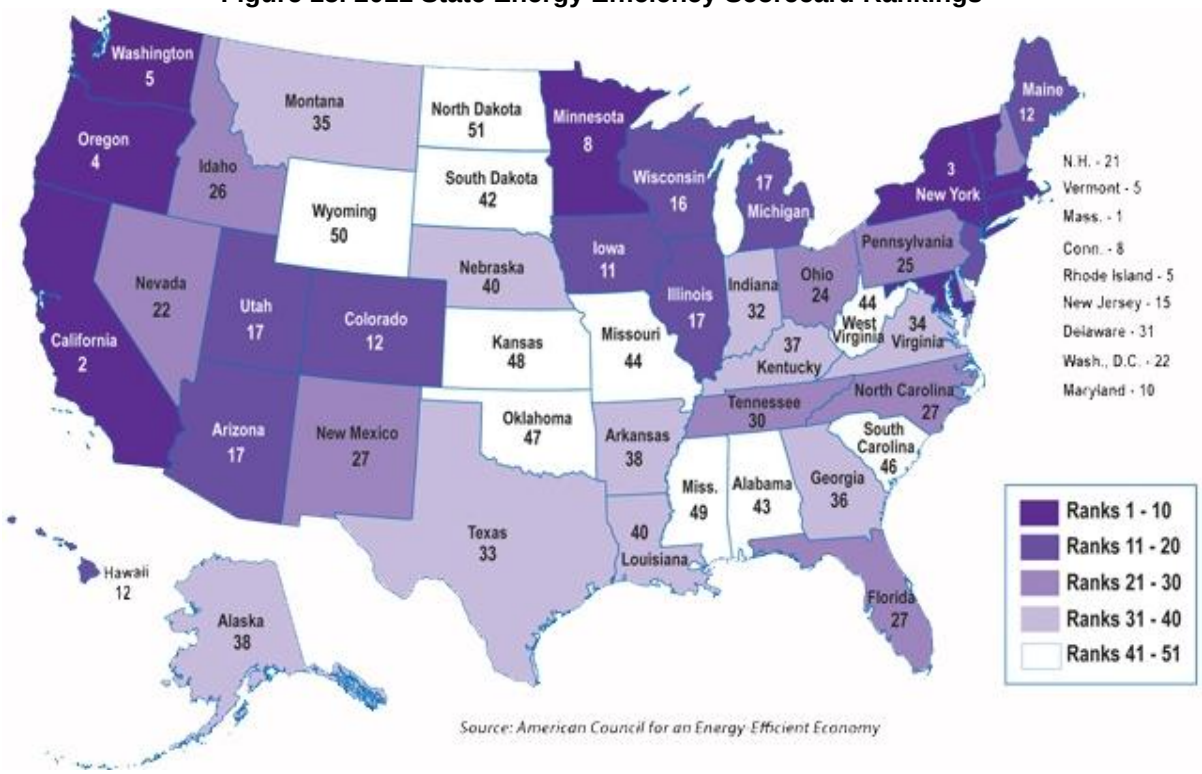
Differences among States

Although we provide individual state scores and rankings, we note that the difference between rankings is most significant in “bins” of ten or fifteen, rather than differences between individual rankings. The tiers of ten, as presented in Table 30, are therefore the best way to interpret the results of the *Scorecard.*

Changes in Scoring Methodology

Some minor changes in scoring methodology compared to last year may affect some of the overall rankings. The Utility and Public Benefits Fund Program and Policies chapter revised the methodology for scoring performance incentives and alternative regulatory business models for utilities to better capture the wide range of strategies undertaken by states. We reduced the appliance standards metric from three to two points and increased the transportation score from eight to nine points. In the Transportation section, we placed greater emphasis on policies that integrate land use and transportation planning. The Building Codes chapter readjusted the scoring methodology to reward full credit to states exceeding the 2009 IECC and ASHRAE 90.1-2007 codes or equivalent standards. In the State Government Initiatives chapter, we have included a new metric measuring state government policies and programs enabling the use of energy savings performance contracts (ESPCs), which allow states to enter into a performance-based agreement with an Energy Service Company (ESCOs). We also slightly changed the scoring methodology in the Building Codes chapter to award credit for states without statewide mandatory building energy codes for various levels of adoptions by major jurisdictions.

Figure 15. 2011 State Energy Efficiency Scorecard Rankings



Notes: Several states have the same score and tie for the same ranking, including 5, 8, 12, 17, 22, 27, 38, and 44. We do not score the U.S. territories due to lack of data, though hope to include them in future rankings.

"Most Improved" States

This year's most improved states compared to last year's *Scorecard* include Michigan, Maryland, Illinois, and Nebraska. Michigan, Illinois, and Maryland are reaping the rewards from Energy Efficiency Resource Standards (EERS) passed in 2008, which requires the states' utilities and state governments to provide portfolios of energy efficiency programs sufficient to meet a specific, energy savings target that ramps up over time. Each state increased ratepayer spending on utility sector energy efficiency programs from negligible levels in 2008 to substantial levels in 2010. Energy savings reflect the increased funding levels in these states, increasing from savings equivalent to around 0% of retail sales to 0.4% in 2009.

Aside from utility-sector energy efficiency, each of these states has made significant strides in other energy efficiency areas. Both Illinois and Maryland recently began offering financial incentives for high-efficiency vehicles. Michigan has undertaken significant efforts to retool its manufacturing industry to pursue clean energy technology development. A major piece of this effort is the research, development, and demonstration of energy efficiency technologies. Nebraska passed into law major upgrades to residential and commercial building codes in 2011, adopting a set of codes that will make homes and businesses comfortable and energy-efficient. The state also continues to be a leader in the implementation of state-government administered financing programs with the Dollar and Energy Savings Loan Program, which provides a wide range of customer classes with low-interest loans to make energy efficiency upgrades.

States Losing Ground

A number of states fell in the rankings, but in most cases, the fall can be attributed to other states making progress at faster pace rather than a state backsliding energy efficiency efforts. While twenty-five states fell in the rankings, only seven saw a decline in their total score. Pennsylvania, the state that fell farthest, fell ten places but only saw its score decrease by 3 points. In Pennsylvania's case, the state is in the process of implementing an EERS that will result in higher savings and investment levels, which future editions of the *Scorecard* will pick up. Movement among the states should be expected. The second and third tiers of the *Scorecard* are quite competitive as only four points separates 10th and 20th and 20th and 30th places. Idling states will not fare well as others ramp up efforts to become more energy-efficient.

Looking Ahead to 2012

In addition to the many states that have moved up in the rankings compared to last year's report, we see signs that states continue to raise the bar on energy efficiency program and policy commitments. Next year, we will see further improvements in leading states ramping up to meet aggressive energy savings targets such as New York and Massachusetts. Numerous states that only recently began implementing utility-sector energy efficiency programs such as Pennsylvania, Michigan, Ohio, Indiana, Arkansas, and Arizona will continue to ramp up efficiency program activity over the next few years to meet those rising goals.[67] A handful of states near the bottom of the Scorecard, including Georgia and Oklahoma, have also expanded energy efficiency program portfolios in recent years, which should be reflected in next year's *Scorecard*.

New and forthcoming rules from the EPA regulating emissions from multiple sources will dramatically alter the way emissions from some CHP systems are calculated and regulated. State regulatory approaches and programs currently in place that affect the way in which CHP system emissions are regulated may be rendered moot by future EPA activity. Such changes will be reflected in the 2012 Scorecard.

States will also face challenges that threaten to diminish the impact of energy efficiency in 2012. Uncertainty surrounding the economic recovery may dampen willingness among residential and commercial customers to invest in energy efficiency upgrades. If demand falters, energy efficiency programs may perform below expectations for customer participation rates, savings, and spending levels. Slowdowns in efficiency programs could lead to negative consequences in the regulatory and policy realm. State regulators may allow utilities to miss energy savings targets or impose cost caps or exit ramps that inhibit cost-effective program implementation. The strains on state budgets may compel state policymakers to raid ratepayer or RGGI funds to shore up state finances as has occurred in the past.

Further Areas of Research

The scoring framework we described at the beginning of this report is our best attempt to represent the myriad efficiency metrics as a quantitative "score." Any effort to convert state spending data, energy savings data, and adoption of best practice policies, across six policy areas, into one state energy efficiency "score" has its obvious limitations. We suggest here a few areas of future research that will assist our continuing efforts to refine the scoring methodology.

One of the most glaring limitations is access to reliable and recent data on results from energy efficiency efforts. Many states do not gather the data on performance of energy efficiency policy efforts, forcing us to score them using a "best practices" for some of the policy areas. For example, scoring states on building energy code compliance was difficult because states do not have the resources to collect the required data to estimate a state's level of compliance. While states should

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

be applauded for adopting stringent building energy codes, the success of these codes at reducing energy consumption is indeterminable if we are unable to verify that they are actually being implemented. Inclusion of building energy code compliance metrics, based on a state-by-state review of compliance and enforcement activity, is an improvement over previous versions of the *Scorecard*, and we hope to continue to refine a survey of state code compliance in the future.

Next year, we hope to develop a more comprehensive and quantitative assessment of state efficiency programs that fall outside the realm of utility-sector and public benefits programs. Since the passage of the Recovery Act, 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 be more adept at tracking and presenting program spending and savings data. We also hope to recognize state government and regulatory efforts to enable home- and business-owners to finance energy-efficiency improvements through on-bill financing, which allows utility customers to pay down improvements through their utility bills. The *Scorecard* does not address energy efficiency finance strategies such as Property Assessed Clean Energy (PACE), which allows property owners to use real tax liens to access commercial debt markets.

In the utility sector, we urge states to systematically track statewide savings and spending levels for energy efficiency programs. The current resources available for state-by-state comparisons of energy efficiency program spending and savings in the utility sector do not capture the full set of programs available to customers. In particular, programs administered by third-parties, public-power generators, and co-operative and municipal utilities are seriously undercounted in the major datasets used in this report. While we can fill some data gaps by conducting interviews with commission staff, future iterations of the *Scorecard* would benefit greatly 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.[68] Furthermore, we would also like to capture spending and savings data for energy efficiency programs targeting home heating fuel and propane. In future editions of the *Scorecard*, we plan to examine metrics for fuel oil and propane efficiency, as well as energy savings from natural gas.

Additionally, we will look further into the potential for giving states credit for incentive programs for solar hot water systems, which are a proven energy-saving technology. Finally, as U.S. territories ramp up energy efficiency efforts, we hope that the data becomes robust enough for integration in the *Scorecard*. The current sets of data do not allow for proper comparisons and the activity is fairly minimal beyond ARRA-related programs. We will continue looking into the possibility in future editions of the *Scorecard*.

CONCLUSIONS

Energy efficiency policies and programs continued to advance at the state level in 2011. A group of leading states remains steadfast in their commitment to the efficient use of energy in transportation, buildings, and industry, fostering economic development in the energy efficiency services and technology industry and saving money for consumers to spur growth in all sectors of the economy. A growing number of states have progressed, some rapidly, over the past few years in the pursuit of reaching their full energy efficiency potential. A wide gap remains, however, between states near the top and those at the bottom of the *Scorecard* rankings. Because of market barriers and the regulated nature of the energy sector, a regulatory environment that encourages energy efficiency is critical to reach its full potential. The findings presented in the Scorecard should guide states efforts to harness the power of energy efficiency in all economic sectors. Energy efficiency is a resource abundant in every state and reaching its full potential will be critical to meeting the environmental, economic, and reliability demands of the next century.

[68] A forthcoming report from M.J. Bradley & Associates delves deeper into the data gaps that inhibit the comprehensive benchmarking of utility energy efficiency spending and savings.

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APPENDIX A. UTILITY AND PUBLIC BENEFITS FUND ENERGY EFFICIENCY BUDGETS PER CAPITA

2010 State Electricity Efficiency Program Budgets per Capita

State	2010 Budgets ($1,000)	Spending per Capita
Vermont	$34.0	$54.62
Massachusetts	$301.9	$45.53
Connecticut	$126.9	$35.97
California	$1,158.1	$31.08
Minnesota	$160.2	$30.28
Rhode Island	$32.1	$30.40
New York	$583.6	$29.81
Washington	$184.9	$27.42
Oregon	$91.1	$23.63
Idaho	$36.1	$23.14
New Jersey	$198.1	$22.68
Iowa	$67.8	$22.43
New Hampshire	$26.3	$19.87
Utah	$55.5	$19.61
Nevada	$45.0	$16.95
Wisconsin	$92.3	$16.28
Maryland	$88.8	$15.48
District of Columbia	$9.4	$15.36
Hawaii	$19.3	$14.85
Arizona	$92.3	$13.82
Ohio	$152.8	$13.25
Maine	$14.0	$12.97
Illinois	$165.5	$12.79
Colorado	$64.7	$12.70
Michigan	$91.5	$9.21
Montana	$8.9	$9.06
Pennsylvania	$110.0	$8.71
New Mexico	$17.5	$8.60
Wyoming	$4.3	$7.85
Tennessee	$48.9	$7.71
Oklahoma	$27.9	$7.49
Nebraska	$13.0	$7.18
Missouri	$40.5	$6.74
Florida	$123.2	$6.60
Kentucky	$27.1	$6.25
Texas	$128.4	$5.09
North Carolina	$45.3	$4.79
Arkansas	$13.1	$4.50
South Dakota	$3.5	$4.22
Mississippi	$12.5	$4.22
Delaware	$3.6	$4.02
Alabama	$17.7	$3.74

State	2010 Budgets ($1,000)	Spending per Capita
South Carolina	$12.3	$2.68
Indiana	$16.5	$2.56
Georgia	$21.6	$2.18
North Dakota	$1.3	$2.02
Kansas	$5.4	$1.90
Alaska	$0.4	$0.55
Virginia	$0.2	$0.03
Louisiana	$0.0	$0.00
West Virginia	$0.0	$0.00
U.S. Total	**$4,595.7**	**$14.87**

*Utility spending is on “ratepayer-funded energy efficiency” programs, or energy efficiency programs funded through charges included in customer utility rates or otherwise paid via some type of charge on customer bills. This includes both utility-administered programs and “public benefits” programs administered by other entities. We do not include data on load management programs or energy efficiency research and development. Population data gathered from (Census 2011).

APPENDIX B: EXPANDED TABLE OF STATE RD&D PROGRAMS

State	Major RD&D Programs	Score
Alaska	The **Cold Climate Housing Research Center** in Fairbanks, Alaska conducts applied research, development, and deployment on sustainable, energy-efficient and healthy buildings in Alaska and the circumpolar north. The Alaska Housing Finance Corporation (AHFC) has a **Research Information Center** (RIC) and the Alaska Energy Authority oversees the **Emerging Energy Technology Fund**, which concentrates heavily on energy efficiency technologies.	2
California	**The California Energy Commission's Public Interest Energy Research (PIER)** program supports research and development in several key areas including energy efficiency for buildings, industry, agriculture, and water systems; generation for renewable resources, combined heat and power, and advanced generation; transportation and alternative fuels, vehicle efficiency, and biofuels; technology systems and smart grid, transmission, and distribution; and environmental research on minimizing impacts from renewable energy development, climate change adaptation and mitigation, and improving indoor air quality. PIER is funded from a surcharge on electricity and natural gas use in the state and totals about $80 million per year.	2
Iowa	The **Iowa Energy Center** advances energy efficiency through research, education, and demonstration. Amongst its many goals, 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.	2
Massachusetts	**Massachusetts Energy Efficiency Partnership (MAEEP)** supports demonstration of energy efficiency technology and tools to the industrial, commercial, and institutional sectors. The MAEEP program leverages resources from USDOE, the University of Massachusetts and Massachusetts Electric Utilities, NSTAR, MECO and WMECO, in partnership. Massachusetts is also offering **High Performance Green Building Grants** to demonstrate innovative ways to improve energy performance in various types of buildings. The grants will use $16.25 million of ARRA funds to leverage an additional $42.5 million from grant recipients. The state's program administrators also have a number of deep energy retrofits and behavioral pilot programs.	2
Michigan	The **Michigan NextEnergy Center** includes laboratory facilities, business incubator space, and other facilities to support the state's alternative energy industry. Energy efficiency and battery storage are central to the NextEnergy Center. As a Renaissance Zone, businesses within the NextEnergy Center may be eligible for tax benefits aside from the numerous tax credits the state offers alternative energy businesses.	2
New York	**The New York State Energy Research and Development Authority (NYSERDA)** RD&D efforts include a wide range of energy efficiency and renewables programs, including, but not limited to, a Renewable Portfolio Standard (RPS), a Regional Greenhouse Gas Initiative (RGGI), clean energy business development, the Smart Grid Consortium and the Battery Energy Storage (BEST) Consortium. NYSERDA's 2009/10 RD&D budget was approximately $165 million.	2
North Carolina	The **North Carolina Green Business Fund** provides grants of up to $100,000 to North Carolina small and mid-size businesses, nonprofit organizations, state agencies, and local governments to encourage the development and commercialization of promising renewable energy and energy-efficient building technologies. The **NC Solar Center** also focuses on energy efficiency to assist commercial and industrial clients in saving energy. This team has grown over the years and now operates multiple programs focusing on Combined Heat & Power (CHP) technology in the Southeast.	2
Ohio	Funded through a 2007 job stimulus package, **Ohio Air Quality Development Authority (AQDA) Advanced Energy Program Grants** will provide $84 million to non-coal related projects. CHP is deemed eligible. **Energy Industries of Ohio** (EIO), a nonprofit corporation that obtains funding from numerous sources to support R&D programs, also seeks to develop, demonstrate, and incubate technologies that will improve the competitiveness of Ohio industry through	2

State	Major RD&D Programs	Score
	increased energy efficiency. The **Ohio Third Frontier Program** also supports energy efficiency in areas such as electric automobile research.	
Oregon	The **Oregon State University Energy Efficiency Center** houses the OSU Industrial Assessment Center, offers rural energy audits, OSU facility assessments, and other customized assessments. The Center focuses on energy efficiency training, and performs related research, analysis, and data collection. The **University of Oregon Energy Studies in Building Laboratory** conducts research on buildings and related transportation to develop strategies for maximum energy efficiency in new materials, components, assemblies, and whole buildings. It has received funding from numerous private and public sources. The **Oregon Built Environment and Sustainable Technologies Center (BEST)** shares research facilities for study of energy-efficient and green buildings. **Portland State University's Renewable Energy Research Lab** conducts sustainable urban development research, which covers smart grid development and net-zero energy use. **The Baker Lighting Lab at University of Oregon** studies daylighting and control of these systems. The **Energy Trust of Oregon** also runs programs to field test emerging technologies.	2
West Virginia	West Virginia has established a number of initiatives to advance energy efficiency, particularly in its industrial and manufacturing sectors. The state has been active in analyzing energy usage in manufacturing facilities across the state, funding benchmarking initiatives for companies of all sizes. The **Energy Efficiency Center of West Virginia** and **West Virginia University Building Energy Center** partner with West Virginia Industries of the Future and the state Manufacturing Extension Partnership to provide centralized locations for the development of new energy-saving technologies and services.	2
Wisconsin	The **Energy Center of Wisconsin** conducts technology and field research; education programs; program evaluation and market research; program development, and implementation. The Energy Center, funded through state, ratepayer, private, and other sources, features an award-winning program on building energy use in commercial new construction. Other research focuses on buildings and market characteristics, as well as bio-energy. **Wisconsin Focus on Energy** operates an Emerging Technology (ET) program that promotes emerging, industrial, energy efficiency technologies. The program deploys and commercializes those emerging industrial technologies that have the potential for large, cost-effective energy savings and multiple installations in Wisconsin.	2
Colorado	**Clean Energy SuperClusters at Colorado State University** are multidisciplinary alliances integrating experts from diverse fields with the goal of rapidly developing products emerging from world class clean energy research. The SuperClusters commonly fund and support energy efficiency projects.	1
Florida	**Florida Solar Energy Center**'s building science program includes research projects concentrating on: Building America Industrialized Housing; Zero Energy Buildings; Fenestration; Energy Efficient Schools; Green Standards; and Ceiling Fans.	1
Minnesota	**The Conservation Applied Research & Development (CARD) Fund** receives $3.1M annually in ratepayer funding to identify new technologies or strategies to maximize energy savings, improve the effectiveness of energy conservation programs, or document carbon dioxide reductions from energy conservation programs.	1
New Jersey	The New Jersey Commission on Science and Technology (CST) administers the **Edison Innovation Clean Energy Fund** through a Memorandum of Understanding with the New Jersey Board of Public Utilities (BPU). 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 identified renewable energy technologies and innovative technologies that significantly increase energy efficiency. All grants are subject to a 50% matching funds requirement. Businesses may also apply for and receive up to 20% of the approved grant amount in equity-like financing from the New Jersey Economic Development Authority (EDA) for non-research and development related costs.	1
New Mexico	The **Energy Innovation Fund** was created in 2007 to accelerate the development	1

State	Major RD&D Programs	Score
	of innovation and enable faster commercial adaptation of clean energy technologies in New Mexico. State appropriations of $2.7M and equal matching private sector investment provided funding for projects awarded in FY08 and FY09. The Energy, Minerals and Natural Resources Department manages the awarded projects.	
Tennessee	The **University of Tennessee** and Tennessee Valley Authority partner with **Oak Ridge National Laboratory** to conduct a number of energy efficiency initiatives. The state also funds the University of Tennessee Research Foundation, which focuses on advanced energy technologies.	1
Texas	The **Texas A&M Energy Systems Laboratory (ESL)** focuses on energy-related research, energy efficiency, and emissions reduction. Some specialized areas include: metering and modeling energy use in buildings; optimization of HVAC systems; and modeling and analysis. ESL plays an important role in the implementation of state energy standards.	1
Vermont	**Efficiency Vermont** is conducting a research study related to how smart grid technologies and consumer behavior can deliver cost-effective energy efficiency savings. As a "franchise" utility, Efficiency Vermont will now have the long-term certainty needed to invest more in RD&D in the years to come.	1
Virginia	Virginia is implementing a $40 million energy infrastructure research and development initiative, which funding the Modeling and Simulation Center for Collaborative Technology in Halifax County to undertake R&D work in energy-efficient advanced manufacturing .	1
Delaware	Delaware offers two RD&D grant programs run through the Green Energy Fund. **Research and Development Grants** offers up to 35% of the cost of qualifying projects, which include energy efficiency technologies. The grants have an annual budget of up to $288,000 annually. **Technology and Demonstration Grants** fund up to 25% of project cost and may be funded up to $720,000 annually.	0.5
Georgia	Funded in part by Georgia Environmental Finance Authority (GEFA), **Southface Energy Institute** conducts research and training on energy-efficient housing and communities. GEFA collaborates with Southface on its weatherization training and technical assistance.	0.5
Hawaii	The ***Transportation Energy Transformation Program*** focuses on deployment with the ***Hawaii EV Ready Program*** and the ***State Fleet Program***. The Hawaii EV Ready Program provides grants and rebates for the installation of electric vehicle chargers and the purchase of new, commercially-available full-speed electric motor vehicles. The program expects results of 1,000–5,000 electric vehicle chargers installed and 200–600 electric vehicle purchases supported by grant and rebate funds.	0.5
Illinois	The **University of Illinois at Chicago Energy Resources Center** focuses on energy conservation and production technologies. Its programs include: energy management assessments; economic modeling; analysis of policy and regulatory initiatives; and public outreach and education. ERC staff work across all market sectors on projects impacting the industrial, commercial, and residential markets.	0.5

APPENDIX C: STATE AND FEDERAL TRANSIT FUNDING

State	FY 2008State Funding	Population	Per Capita Transit Expenditure
Massachusetts	$1,182,785,342	6,544,089	$180.74
New York	$3,015,441,656	19,464,482	$154.92
Maryland	$844,417,234	5,650,870	$149.43
Alaska	$86,814,875	685,532	$126.64
New Jersey	$1,035,472,354	8,657,319	$119.61
Delaware	$86,232,800	876,794	$98.35
Pennsylvania	$1,145,567,000	12,562,536	$91.19
District of Columbia	$272,724,274	3,500,000	$77.92
Connecticut	$267,499,842	3,502,664	$76.37
Minnesota	$339,925,000	5,230,247	$64.99
California	$2,299,578,879	36,538,008	$62.94
Rhode Island	$47,338,005	1,058,368	$44.73
Illinois	$519,300,000	12,836,402	$40.46
Virginia	$228,965,893	7,780,691	$29.43
Wisconsin	$125,179,500	5,627,257	$22.25
Michigan	$200,086,889	9,999,456	$20.01
Oregon	$39,920,803	3,780,596	$10.56
Vermont	$5,899,044	620,967	$9.50
Indiana	$55,733,074	6,386,601	$8.73
North Carolina	$73,466,447	9,230,086	$7.96
Florida	$146,338,770	18,410,241	$7.95
Tennessee	$41,537,000	6,239,542	$6.66
Washington	$39,751,905	6,566,085	$6.05
Wyoming	$2,495,659	532,626	$4.69
New Mexico	$9,296,786	1,984,179	$4.69
Colorado	$23,048,479	4,928,676	$4.68
North Dakota	$2,900,000	640,525	$4.53
Iowa	$13,280,543	2,994,658	$4.43
New Hampshire	$4,474,250	1,320,981	$3.39
Kansas	$5,761,639	2,795,257	$2.06
Arizona	$11,780,000	6,499,207	$1.81
West Virginia	$3,023,342	1,816,352	$1.66
Nebraska	$2,900,000	1,780,143	$1.63
Oklahoma	$5,750,000	3,640,241	$1.58
Arkansas	$4,515,157	2,867,099	$1.57
South Carolina	$6,400,000	4,497,746	$1.42
Ohio	$15,816,982	11,526,691	$1.37
Louisiana	$5,962,530	4,448,806	$1.34
Texas	$28,741,067	24,290,611	$1.18
Missouri	$6,921,541	5,951,844	$1.16
Maine	$1,527,654	1,318,133	$1.16
South Dakota	$770,000	803,047	$0.96

State	FY 2008State Funding	Population	Per Capita Transit Expenditure
Kentucky	$3,501,733	4,287,259	$0.82
Georgia	$6,141,497	9,690,277	$0.63
Mississippi	$1,600,000	2,939,234	$0.54
Montana	$414,820	967,717	$0.43
Idaho	$312,000	1,526,295	$0.20
Alabama	$0	4,673,889	$0.00
Hawaii	$0	1,280,001	$0.00
Nevada	$0	2,612,460	$0.00
Utah	$0	2,724,685	$0.00

APPENDIX D: STATUS OF STATE EFFORTS TO ADDRESS UTILITY LOST REVENUES AND INCENTIVES FOR ENERGY EFFICIENCY[69]

State	Decoupling or Related Mechanism	Performance Incentive
Alabama	1 point. Lost revenue recovery in place for electric and gas - Alabama Power and Alabama Gas Company can recover lost revenues by projecting losses and adjusting rates annually through Rate RSE which includes caps and automatic rate reductions when profits or expenses exceed authorized ranges.	1.5 points. In place for gas and electric - Alabama Power and Alabama Gas Company may recover a reasonable rate of return on efficiency spending via a rate rider.
Alaska	0 points.	0 points.
Arizona	0.5 points. Lost revenue recovery pending for electric and decoupling pending for gas - Both Southwest Gas and Tucson Electric Power have proposed mechanisms.	1 point. In place for electric - Arizona Public Service has a tiered shareholder performance incentive.
Arkansas	1 point. Lost revenue recovery in place for electric and gas - All major, investor-owned utilities (IOUs).	0.5 points. Pending for electric and gas - In December 2010 the Public Service Commission approved incentives as a means to reward energy conservation by investor owned utilities.
California	1.5 points. Decoupling in place for electric and gas - All investor-owned utilities (IOUs).	1.5 points. In place for electric and gas – Investor-owned utilities participate in a risk/reward incentive mechanism.
Colorado	1 point. Partial decoupling in place for gas and disincentive offset in place for electric - In 2007 a partial decoupling three-year pilot mechanism was approved. The Public Service Company of Colorado has a disincentive offset.	1.5 points. In place for electric and gas – Incentive approved in 2008 for Public Service Company of Colorado and Black Hills.
Connecticut	1 point. Decoupling (pilot) for electric and lost revenue recovery for gas (gas decoupling pending).	1 point. In place for electric.
Delaware	1 point. Decoupling pending for electric and gas - Delmarva has applied for a form of decoupling for gas and electric, however the Public Service Commission has not yet issued a decision.	0 points.
District of Columbia	1 point. Decoupling for electric – Potomac Electric Power Company collects a Stabilization Adjustment. . Washington Gas Light has requested decoupling, but was denied.	1.5 points. In place for electric and gas – A third party administrator can earn a performance-based incentive.
Florida	0.5 point. Decoupling is pending for gas and lost revenue recovery is pending for electric - Electric utilities may request recovery of lost revenues via a rate case. Gas utilities may request decoupling.	0.5 point. Pending for electric and gas - Legislation has authorized an additional return on equity for energy savings in excess of goals in 2008, but no utilities have requested one.
Georgia	0.5 point. Lost revenue recovery for electric – Georgia	1 point. In place for electric – Georgia Power

[69] More detailed information is available on ACEEE's State Policy Database, www.aceee.org/sector/state-policy

State	Decoupling or Related Mechanism	Performance Incentive
	Power may recover lost revenues from implementing conservation programs via an "additional sum".	may earn a percentage of net benefits from electricity savings from the implementation of efficiency programs via an "additional sum".
Hawaii	1 point. Decoupling for electric – Decoupling was approved in 2010 for Hawaiian Electric Company companies.	1 point. Hawaii transferred administration of efficiency programs to a third-party administrator in 2009. An incentive for exceeding savings goals is available.
Idaho	1 point. Decoupling for electric – A Fixed-Cost Adjustment was approved for Idaho Power Company in 2007 and expires at the end of 2011.	0 points. A pilot program for Idaho Power Company was cancelled in 2009.
Illinois	1 point. Decoupling for gas - North Shore Gas and Peoples Gas and Coke are approved for revenue-per-customer decoupling pilots through 2011.	0 points.
Indiana	1 point. Decoupling for gas and electric and lost revenue recovery for electric - The Southern Indiana Gas Company and Electric Company, have decoupling. Vectren has a Reliability Cost and Revenue Adjustment Mechanism. Duke Energy Indiana has lost revenue recovery.	1.5 points. In place for electric and gas - Indianapolis Power & Light and Southern Indiana Gas & Electric Company have tiered shareholder performance incentives and Indiana Michigan Power Company has a shared benefits approach.
Iowa	0.5 points. Lost revenue recovery authorized for gas, but not in place - Utilities may request recovery of lost revenues on a case by case basis, though none currently have a mechanism in place.	0 points.
Kansas	0.5 points. Lost revenue recovery in place for electric and decoupling authorized for gas, but not in place - Utilities may request recovery of decoupling on a case by case basis, though none currently have a mechanism in place.	0.5 points. Authorized for electric and gas, but not in place - Utilities can request shared savings performance incentives on a case by case basis, however no plans have been approved.
Kentucky	1 point. Lost revenue recovery is in place for electric and gas utilities – The largest investor-owned utilities have a mechanism in place.	1.5 points. In place for electric and gas – Duke Energy, Louisville Gas & Electric and Kentucky Power (AEP) have shared savings mechanisms in place.
Louisiana	1 point. In place for electric and gas utility - In New Orleans there is a rate rider that provides for recovery of lost contribution to fixed costs for the electric and gas utility Entergy.	1.5 points. In place for electric and gas - In New Orleans there is a rate rider that provides an incentive to the electric and gas utility Entergy.
Maine	0.5 points. Decoupling authorized for electric and gas – Decoupling is authorized under statute, but not in place. Efficiency programs are implemented by a government agency.	0.5 points. Authorized for electric and gas, but not in place – Incentives are authorized under statute, but efficiency programs are implemented by a government agency.
Maryland	1.5 points. Decoupling in place for electric and gas – the three investor-owned utilities have decoupling in place.	0.5 points. Authorized for electric and gas, but not in place – Legislation authorizes incentives, but none have been

State	Decoupling or Related Mechanism	Performance Incentive
		approved.
Massachusetts	1.5 points. Decoupling in place for electric and gas – decoupling is implemented for all major gas and electric utilities.	1.5 points. In place for electric and gas – Shareholder incentives can be earned based on achievement of performance targets.
Michigan	1.5 points. Decoupling in place for electric and gas – Decoupling implemented for Consumers Energy, Detroit Edison, Michigan Gas Utilities and Michigan Consolidated Gas Company.	1.5 points. In place for electric and gas – Detroit Edison Company has an incentive in place.
Minnesota	1 point. Decoupling in place for gas and pending for electric – CenterPoint Energy has decoupling. Electric utilities are to submit proposals by the end of 2011.	1.5 points. In place for electric and gas – Incentives have been in place since 1999.
Mississippi	0 points.	0 points.
Missouri	0.5 points. Straight-fixed variable pricing in place for gas – Atmos Energy has been approved for a straight-fixed variable pricing structure. The state has approved rules for recovery of lost revenue.	0.5 points. Commission has authorized incentives, but none are currently in place.
Montana	1 point. Lost revenue recovery in place for electric and gas – NorthWestern Energy has a lost revenue recovery mechanism in place.	0.5 points. Statue allows an authorized rate of return, but none has been approved.
Nebraska	0 points.	0 points.
Nevada	1 point. Lost revenue recovery in place for electric. Full decoupling in place for gas – A lost revenue recovery mechanism was approved for NV Energy electric service in 2010.	0.5 points. 5% adder to ROE for electric utilities was eliminated in 2010 when lost revenue mechanism was created. Electric utilities may request an incentive on a program-by-program basis.
New Hampshire	0.5 points. The Public Utility Commission has authorized utilities to apply for decoupling or lost revenue recovery on a case by case basis.	1.5 points. In place for electric and gas – All utilities participate in the state incentive program.
New Jersey	0.5 points. Lost revenue recovery in place for gas, pending for electric - New Jersey Natural Gas Co. and South Jersey Gas Co. have a rate rider for collection of lost revenues. Atlantic City Electric and Rockland Electric Company have proposed a bill stabilization agreement that calls for monthly true-ups though a decision on the issue of lost revenues has been deferred.	0 points.
New Mexico	0 points. Lost revenue recovery pending for electric and gas – A rate rider had been approved to remove regulatory disincentives, however a recent court case overturned the mechanism. Legislation requires that regulatory disincentives to cost-effective efficiency be removed.	0.5 points. Pending for electric and gas – A rate rider had been approved to provide an incentive for efficiency, but was overturned by a recent court case. Rules adopted in April 2010 provide for a financial bonus to utilities for energy savings.

State	Decoupling or Related Mechanism	Performance Incentive
New York	1.5 points. Decoupling in place for electric and gas – Utilities are ordered to file proposals for decoupling mechanisms in ongoing and new rate cases.	1.5 points. In place for electric and gas – Incentive program is mandatory for electric utilities. A similar program exists for gas utilities, but they may opt out.
North Carolina	1.5 points. Decoupling in place for electric and gas, lost revenue recovery in place for electric – Duke Energy Carolinas has mechanisms in place which permit decoupling and recovery of lost revenues. Lost revenue recovery and decoupling have been approved for several additional utilities.	1 point. In place for electric – Progress Energy Carolinas and Duke Energy Carolinas have incentives in place.
North Dakota	0 points.	0 points.
Ohio	1 point. Lost revenue recovery in place for electric and gas – Utilities are permitted to recover lost revenues on a case-by-case basis.	1 point. In place for electric – Several electric utilities have incentives in place, including the Duke Save-A-Watt program. Columbia Gas has a shared savings mechanism pending approval.
Oklahoma	0.5 points. Lost revenue recovery in place for electric, but not gas – Both Public Service Oklahoma and Oklahoma Gas and Electric Company recover lost revenues.	1 point. In place for electric - Both Public Service Oklahoma and Oklahoma Gas and Electric Company have shared benefit incentive plans.
Oregon	1.5 points. Decoupling in place for electric and gas – Portland General Electric has a "Sales Normalization Adjustment". Cascade Natural Gas and Northwest Natural Gas have had mechanisms in place since 2006 and 2003, respectively.	0 points.
Pennsylvania	0 points.	0 points. Disincentive in place for electric – Electric utilities may be fined if they fail to meet their efficiency targets.
Rhode Island	1.5 points. Decoupling pending for electric and gas – National Grid has a decoupling proposal pending.	1.5 points. In place for electric and gas - Shareholder incentive for electric and gas since 2005 and 2007, respectively.
South Carolina	0.5 points. Lost revenue recovery in place for electric, but not gas – Duke, Progress and South Carolina Electric & Gas all have lost revenue recovery mechanisms in place.	1 point. In place for electric – Progress and South Carolina Electric & Gas have shared savings incentives. Duke has an avoided cost recovery plan.
South Dakota	1 point. Lost revenue adjustment for electric and gas – Northwestern Energy has a lost revenue recovery mechanism for both electric and gas. (GE09-001)	1.5 points. In place for electric and gas – Mechanisms have been approved for several utilities including OtterTail Power, MidAmerican, Montana-Dakota Utilities and Northwestern Energy.
Tennessee	0.5 points. Lost revenue recovery for gas – Chattanooga Gas Co. collects a monthly charge for fixed costs to align utility interests to better promote	0 points.

State	Decoupling or Related Mechanism	Performance Incentive
	efficiency.	
Texas	0 points.	1 point. In place for electric – All investor-owned utilities have a shared benefit incentive.
Utah	1 point. Decoupling for gas, electric pending – Questar Gas has tariffs that authorize revenue based on the number of customers served. Legislation encourages the Commission to remove financial disincentives to efficiency.	0.5 points. Legislation expresses support for incentives, but none have been authorized.
Vermont	1 point. Decoupling in place for electric, but not gas – Central Vermont Public Service has a decoupling mechanism that expires in 2011. Vermont Gas has an Alternative Regulatory Plan in place.	1 point. In place for electric – Vermont contracts an independent third party to operate efficiency programs. The contract includes a performance-based incentive.
Virginia	1 point. Decoupling in place for gas, lost revenue recovery pending for electric – Several gas utilities have decoupling. Dominion has applied for recovery of lost revenues, but was not approved.	0.5 points. Pending for electric – Legislation authorized incentives for electric utilities, though none have been approved.
Washington	1 point. Decoupling and lost revenue recovery in place for gas, but not electric –Cascade Natural Gas has decoupling in place. Avista has a lost revenue recovery mechanism in place.	0.5 points. Disincentive in place for electric - Electric utilities may be fined if they fail to meet their efficiency targets. Commission has issued guidance for utilities to request incentives.
West Virginia	0 points.	0 points.
Wisconsin	1 point. Decoupling in place for electric, lost revenue recovery in place for gas – Wisconsin Public Service Corporation received approval for decoupling in 2008. Wisconsin Electric Power Company's Gas Cost Recovery Mechanism was approved in 2011.	1.5 points. In place for electric and gas – Wisconsin Power and Light has a shared savings program.
Wyoming	1 point. Decoupling in place for gas, lost revenue recovery in place for electric – Questar Gas Company has a pilot decoupling mechanism. Montana-Dakota Utilities Company has a load management tracking adjustment mechanism.	0 points.

APPENDIX E: SUMMARY OF STATE BUILDING CODE STRINGENCY

State	Summary of State Building Code Stringency	Score
Alabama	Alabama has no mandatory state-wide code for residential or commercial buildings. The Residential Energy Code for Alabama (RECA) is voluntary and based on the 2006 IECC, except for the exclusion of the SHGC 0.40 requirement for glass windows. For commercial buildings, the Alabama Building Energy Conservation Code (ABECC), based on ASHRAE 90.1 – 2001, is only mandatory for government-owned buildings. Builders can use RECA and ABECC until June 1, 2009. For both residential and commercial buildings, the 2006 IECC can be used voluntarily as of December 1, 2008. On April 12 2011, both the residential energy subcommittee and the full membership of the Alabama Residential and Energy Codes Board approved a proposal to adopt a new residential energy code based on the 2009 IRC with strengthening amendments that would make it equivalent to the 2009 IECC. The Board had previously approved a new commercial code based on the 2009 IECC in January 2011. A public commenting period will follow along with a final vote by the board. The effective date is unknown.	4
Alaska	Alaska's residential code is the state-developed Building Energy Efficiency Standard (BEES), which is based on the 2009 IECC and ASHRAE Standard 62.2-2010 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).	2
Arizona	There is no mandatory residential or commercial energy code in Arizona. 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. Arizona is a home-rule state, meaning that codes are adopted and enforced on a local rather than state level. Lists of jurisdictions that have adopted codes can be found at the EERE and BCAP pages linked below.	2
Arkansas	Arkansas' residential and commercial building energy codes are mandatory state-wide and are based on the 2003 IECC. The Arkansas Energy Code, which applies to residential buildings, includes state-specific amendments. Arkansas' commercial building code also includes ASHRAE 90.1 – 2001. Newly constructed or remodeled public buildings must comply with ASHRAE 90.1-2007.	2
California	California's energy code is considered to be the most aggressive and best enforced energy code in the United States, and has been a powerful vehicle for advancing energy-efficiency standards for building equipment. Many specifications are performance-based, offering flexibility for designers. The code also stands out because it includes field verification requirements for certain measures and reports high compliance rates overall. The most recent code, effective January 1, 2010, is mandatory statewide and exceeds 2009 IECC standards for residential buildings and meets or exceeds ASHRAE/IESNA 90.1-2007 for commercial buildings.	5
Colorado	Colorado is a home rule state with a voluntary building code for both residential and commercial construction with the 2003 IECC as a mandatory minimum for jurisdictions that have adopted a code previously. Jurisdictions that have not adopted or enforced codes are exempt from the 2003 IECC requirement, although the 2009 IECC is mandatory for all factory-built and multi-family structures – commercial and residential – in areas that do not adopt or enforce buildings codes. A list of jurisdictions that have adopted codes can be found at the EERE and BCAP pages linked below.	2
Connecticut	Connecticut has statewide codes for both residential and commercial buildings based on the 2009 IECC. On January 28, 2009, HB 6284 was	4

State	Summary of State Building Code Stringency	Score
	introduced in the Connecticut General Assembly with the purpose of creating a new state building energy code and green buildings for certain construction projects. The House passed the bill on May 26, 2009 and the Senate followed on June 2, 2009. The bill requires the incorporation of the 2012 IECC within 18 months of its publication. Effective July 1, 2010, the bill requires a LEED-Silver rating for certain residential buildings that are projected to cost $5 million or more as well as for renovation to certain residential buildings that are projected to cost $2 million or more.	
Delaware	Through the passing of SB 59 and effective July 1, 2010, Delaware's residential and commercial codes were updated to follow the 2009 IECC.	4
District of Columbia	Washington D.C.'s energy codes are mandatory across the District. For residential buildings, builders must comply with the 2008 D.C. Construction Codes, which is based on the "30% Solution" and is more stringent than the 2009 IECC. For commercial buildings, builders must again comply with the 2008 D.C. Construction Codes, which is based on ASHRAE 90.1-2007.	4.5
Florida	Florida has a state-developed mandatory code, Chapter 13 of the Florida Building Code, which directs residential construction to meet/exceed the 2006 IECC and commercial construction to meet/exceed ASHRAE 90.1 – 2004. In 2008, Governor Charlie Crist signed HB 697, which requires the Florida Building Commission to select the most current version of the IECC as a foundation code, but must modify it to maintain the thermal efficiencies of the Florida Energy Efficiency Code for Building Construction adopted and amended pursuant to § 553.901. The state-specific modifications will require improvements equivalent to the 2009 IECC for Florida's commercial sector, though a recent report by the Florida Solar Energy Center determined that the requirements for residential buildings will generate efficiency gains 3% below the 2009 IECC. The 2010 Florida Building Code, which will become effective March 15, 2012, will update the state code to be at least as stringent as the 2009 IECC for residential construction and ASHRAE 90.1-20007 for commercial construction.	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 (NGBS) with 2011 Georgia Amendments, as an optional code. It is available for local government adoption and enforcement.	5
Hawaii	On October 13, 2009, the Hawaii Building Code Council approved the 2006 IECC with state-specific amendments as the mandatory statewide energy code for both the residential and commercial sectors. The code will become law once an Administrative Directive is approved, which is expected to be signed soon by Governor Linda Lingle. Counties of Hawaii can modify the statewide code, as long as the codes are at least as stringent as the statewide code.	4
Idaho	Effective January 1, 2011, the 2009 IECC is mandatory statewide for residential and commercial construction, the latter with reference to ASHRAE 90.1-2007.	4
Illinois	The Illinois Energy Conservation Code is mandatory statewide and incorporates the 2009 IECC for all residential buildings 3 stories or fewer in height. Commercial buildings, privately or publicly funded, must comply with the 2009 IECC with reference to ASHRAE Standard 90.1-2007.	4
Indiana	The Indiana Energy Conservation Code is state-developed and mandatory statewide. For residential buildings, the code is equivalent to the 1992 MEC, but the code has been repealed and, as of mid-2010, the state Fire Commission has been working on updating the code to the 2009 IECC. 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	3.5

State	Summary of State Building Code Stringency	Score
	28, 2008, requires all new state buildings to earn LEED silver certification.	
Iowa	The Iowa State Energy code is mandatory statewide for residential and commercial buildings. Residential buildings must comply with the 2009 IECC, while the commercial buildings must also comply with the 2009 IECC, with reference to ASHRAE 90.1 – 2007.	4
Kansas	Kansas 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. And although the commercial building code specifies the 2006 IECC as mandatory statewide, there is no enforcement mechanism in the statute (KSA 66-1227). The same statute also states that "the state corporation commission has no authority to adopt or enforce energy efficiency standards for residential, commercial, or industrial structures."	1
Kentucky	The 2007 Kentucky Residential Code (KRC) mandates residential buildings must comply with the 2006 IECC or IRC with state amendments while the 2007 Kentucky Building Code (KBC) states that commercial construction must comply with the 2009 IECC or the 2009 IBC with state amendments.	3.5
Louisiana	Residential buildings must meet the 2006 IRC with reference to the 2006 IECC. ASHARE/IESNA 90.1-2004 is mandatory for commercial buildings while the 2006 IECC is mandatory for those buildings not covered by ASHRAE, i.e. all multi-unit low-rise (3 or fewer stories) residential buildings.	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. Towns with a population less than 4,000 are not required to enforce the code. According to the Northeast Energy Efficiency Partnership, this exempts 50-60% of the state's population.	4
Maryland	The 2010 Maryland Building Performance Standards are mandatory statewide and require both the residential and commercial building codes to comply with the 2009 IECC, the latter with reference to ASHRAE 90.1-2007. § 12-503 of the Maryland Code requires the Department of Housing and Community Development to adopt the most recent version of the IECC twelve (12) months after it is issued and may adopt energy conservation requirements that are more stringent than the codes, but may not adopt energy conservation requirements that are less stringent. Currently, Maryland is on track to adopt the 2012 IECC for both residential and commercial buildings by January 1, 2012.	5
Massachusetts	As of January 1, 2010, the Massachusetts Board of Building Regulations and Standards (BBRS) requires use of the 2009 IECC with state-specific amendments for both residential and commercial buildings, mandatory statewide. Massachusetts is required by the Green Communities Act of 2009 to adopt each new IECC edition within one year of its publication. In July 2009, Massachusetts became the first state to adopt an above-code appendix to its state code – the 120 AA 'Stretch' Energy Code. The 'Stretch' Code is an enhanced version of the 2009 IECC with greater emphasis on performance testing and prescriptive requirements. It was designed to be approximately 20 percent more efficient than the base energy code – the 2009 IECC for new construction, with less stringent requirements for residential renovations. The 'Stretch' Code is voluntary.	5
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.	4
Minnesota	Both Minnesota's residential and commercial building codes, the 2007 Minnesota State Building Code, are mandatory statewide. The residential code (Chapter 1322) is based on Chapter 11 of the 2006 IRC with amendments. The commercial code (Chapter 1323) is based on ASHRAE 90.1-2004 with amendments. The 2007 Minnesota State Building Code became effective June 1, 2009.	3
Mississippi	Mississippi's residential and commercial energy codes are voluntary, except	0

State	Summary of State Building Code Stringency	Score
	for state-owned buildings, public buildings, and high-rise buildings. Mississippi's residential code is based on ASHRAE 90 – 1975 and the prior 92 MEC. The commercial code is also based on ASHRAE 90-1975.	
Missouri	Missouri has no mandatory state-wide codes but has significant adoption of codes in major jurisdictions. State-owned residential buildings must comply with latest edition of the MEC or the ASHRAE 90.2-1993 (single-family and multifamily buildings). As of July 1, 2009, state-owned commercial buildings must comply with the 2006 IECC.	2
Montana	Montana's residential and commercial building codes, codified in ARM Title 24, Chapter 301.160, are mandatory statewide. Montana's residential code requires compliance with the 2009 IECC with amendments. The commercial building code requires compliance with the 2009 IECC with reference to ASHRAE 90.1-2007.	4
Nebraska	Nebraska's residential and commercial energy codes 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.	4
Nevada	Both the residential and commercial building codes are based on the 2006 IECC and are mandatory for jurisdictions without energy codes, with reference to ASHRAE 90.1-2004 for commercial buildings.	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.	4
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.	4
New Mexico	In June 2011, the New Mexico Construction Industries Commission (CIC) repealed the 2009 New Mexico Energy Conservation Code (NMECC) and other construction codes the Commission adopted in 2010. The CIC had originally adopted a 2009 NMECC version containing strengthening amendments to the 2009 IECC that achieved savings roughly 20% greater than the 2006 IECC. In early 2011, the NMECC was subject to administrative rollback attempts and an ultimately successful advocate legal challenge. In April 2011, the CIC gave initial approval to the proposed changes to the NMECC that would revert the code back to the base 2009 IECC code, with final approval in June 2011. The previous version of the NMECC, which was based on the 2006 IECC, will be effective until the revised version from June 2011 takes effect in February 2012.	4
New York	The 2010 Energy Conservation Construction Code of New York (ECCCNYS) became effective December 28, 2010, and is mandatory statewide for both residential and commercial buildings. The residential code is based on the 2009 IECC with state-specific amendments. The commercial code is also based on the 2009 IECC with state-specific amendments. The commercial codes can also follow ASHRAE 90.1-2007.	4
North Carolina	The 2009 North Carolina Energy Conservation Code (NCECC) is mandatory statewide for both residential and commercial buildings. The residential and commercial codes are based on the 2006 IECC with amendments, while the commercial code also references ASHRAE 90.1-2004. The 2012 NCECC becomes effective January 1, 2012 and will be based on the 2009 IECC.	4
North Dakota	North Dakota has no statewide mandatory energy codes. As of August 1, 2009, the 1993 MEC was removed as the voluntary state residential energy code and ASHRAE 90.1-1989 was removed as the voluntary state commercial energy code. The voluntary energy code has been placed under the purview of the North Dakota State Building Code and now the state Building Code Advisory Committee now has the authority to make recommendations that could include energy standards future editions of the State Building Code. Chapters 11 and 13 of the 2009 IRC and IBC are contingent upon adoption by local jurisdictions.	0

State	Summary of State Building Code Stringency	Score
Ohio	Both Ohio's residential and commercial energy codes are mandatory statewide. The residential code is based off the 2006 IECC. 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 2006 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, with an expected effective date in September 2011.	3.5
Oklahoma	Oklahoma is a "home rule" state and has no mandatory statewide codes. The 2009 IRC is mandatory for jurisdictions without their own codes and for state-owned and –leased facilities.	1
Oregon	The 2011 Oregon Residential Specialty Code (ORSC) and the 2010 Oregon Energy Efficiency Specialty Code (OEESC) are mandatory statewide. The Oregon Building Codes Division recently issued a rulemaking updating the residential code to the 2011 ORSC (from the 2008 ORSC), which is intended to achieve 10-15% greater savings than the 2008 ORSC, making it at least as stringent as the 2009 IECC. The OEESC is based off of the 2009 IECC with state amendments that make it more stringent than the 2009 IECC.	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 (DLI) to promulgate regulations adopting "a new triennial BOCA National Building Code, or its successor building code," and/or "a new triennial ICC International One and Two Family Dwelling Code" by December 31st of the year in which they are issued. However, on January 31, 2011, HB 377 was introduced that would amend the Uniform Construction Code Act of 199 to require a 2/3 approval for any code update proposals by the DLI, along with other weakening amendments to the codes. The bill was signed by Governor Tom Corbett on April 25 as Act 1. The UCC has been subject to rollback attempts before in both the legislature and state courts.	4
Rhode Island	The 2010 Rhode Island One and Two Family Dwelling Code for residential buildings became effective July 1, 2010 and is based on the 2009 IRC with state-specific amendments. The 2010 Rhode Island State Energy Conservation Code for commercial buildings also became effective July 1, 2010, and is based on the 2009 IECC and ASHRAE 90.1-2007 with state-specific amendments. Both codes are mandatory statewide.	4
South Carolina	South Carolina's residential and commercial energy codes are mandatory statewide. All new residential and commercial buildings must meet the 2006 IECC.	3
South Dakota	South Dakota has no mandatory statewide energy codes for residential or commercial construction. Codes are adopted by jurisdiction voluntarily; the 2006 IECC is voluntary for new residential buildings. All state facilities are contractually required to be built to the ASHRAE 90.1-1999 standard.	0
Tennessee	Tennessee is a home rule state, which gives jurisdictions the power to adopt 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.	3
Texas	Texas' building codes are mandatory for both residential and commercial construction. In June 2010, the Texas State Energy Conservation Office (SECO) officially adopted a rule to update the state's energy codes codified in 34 TAC §19.53. The rule will update the Texas Building Energy Performance Standards so that single family homes will have to comply with the 2009 IRC beginning January 1, 2012. For all other residential, commercial, and industrial buildings, the 2009 IECC became effective April 1, 2011. State-owned buildings must meet ASHRAE 90.1-2007. For all buildings,	4

State	Summary of State Building Code Stringency	Score
	jurisdictions can choose to adopt more stringent standards.	
Utah	Utah's Uniform Building Code (UUBC) for residential and commercial building energy codes is mandatory statewide. Residential construction must comply with the 2006 IECC. Commercial construction must comply with the 2009 IECC, with reference to ASHRAE 90.1-2007.	3.5
Vermont	Vermont's Residential Building Energy Standard (RBES) is a statewide code based on the 2000 IECC with state-specific amendments that is mandatory for residential buildings. The 2005 Guidelines for Energy Efficient Commercial Construction is based on the 2004 IECC Supplement with amendments to include ASHRAE 90.1-2004 and state-specific amendments. On May 27, 2009, the state legislature passed the Vermont Energy Act of 2009 (H. 466), which directs the Commissioner of the Department of Public Service (DPS) to adopt the 2009 IECC and ASHRAE 90.1-2007 as well as develop a plan to achieve 90% compliance within eight years. The bill directs the Department of Public service to complete a rulemaking on the adoption of the 2009 IECC for residential buildings and either the 2009 IECC or ASHRAE 901.-2007 for commercial buildings by January 1, 2011, effective upon final adoption. On July 1, 2011, the DPS officially updated the 2011 RBES to reference the 2009 IECC with strengthening amendments. The new residential code becomes effective October 1, 2011. DPS is still working on updating the 2011 CBES to reference the 2009 IECC and ASHRAE 90.1-2007 with several strengthening amendments from the 2012 IECC.	4
Virginia	Virginia's Uniform Statewide Building Code (USBC) is mandatory statewide for residential and commercial buildings. As of March 1, 2011, the USBC was updated to reference the 2009 IECC and 2009 IRC, with a one-year phase-in where builders and designers can still use the previous version of the USBC. Residential buildings must comply with the 2009 IRC, while commercial buildings must comply with the 2009 IECC, with reference to ASHRAE 90.1-2007.	3.5
Washington	The 2009 Washington State Energy Code is a state-developed code that is mandatory statewide. The 2009 version of the residential code was developed to be as stringent as the 2009 IECC, while the commercial code was developed to be as stringent as ASHRAE 90.1-2007. For residential construction covered by ASHRAE 90.1-2007 (high rise buildings with four or more stories), the state code is more stringent.	5
West Virginia	West Virginia's residential and commercial building codes are mandatory statewide; however, adoption by jurisdictions is voluntary. Residential buildings are required to comply with the 2003 IECC and the 2003 IRC with amendments. Commercial buildings are required to comply with the 2003 IECC with amendments. On April 11, 2009, the West Virginia Legislature passed bills directing the State Fire Commission to promulgate rules adding the 2009 IECC and ASHRAE 90.1-2007. The updated codes have not yet become effective.	2
Wisconsin	Both Wisconsin's residential and commercial building energy codes are mandatory statewide. The state-developed residential code, referred to as COMM 22 of the Uniform Dwelling Code (UDC), is mandatory for one- and two-family dwellings and incorporates the 2006 IECC with state amendments. The state-developed commercial code, referred to as COMM 63 of the Wisconsin Commercial Building Code, is based on the 2009 IECC.	3.5
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.	0

APPENDIX F: SUMMARY OF STATE BUILDING CODE COMPLIANCE EFFORTS

State	Summary of State Building Code Compliance Efforts	Score
Alabama	Auburn University published a study in 2008 that determined very few jurisdictions have adopted a version of the IECC, while some have adopted the International Residential Code and modified the energy chapter to be less stringent. Energy codes for private sector residential and commercial construction are enforced by local code officials in several jurisdictions. Many smaller jurisdictions currently have no code enforcement. Through a joint contract with the Mississippi Energy Office in 2007, the Energy Division of the Alabama Department of Economic and Community Affairs has been providing workshops for homebuilders, contractors, engineers, and subcontractors. The Code Officials Association of Alabama also provides training to code officials. In 2011, the state energy office provided commercial and residential energy codes training. Additionally, an 18-month grant with Southface Energy Institute has offered training in residential and commercial energy codes for code officials, contractors, designers and policy makers.	0.5
Alaska	While Alaska has no statewide energy code, all buildings that receive aid from the state of Alaska or the Alaska Housing Finance Corporation (AHFC) (including private mortgages) must meet the 2009 IECC codes with Alaska specific amendments. These buildings are fitted with energy rating systems to verify compliance. Currently roughly 50,000 of the 300,000 residences in Alaska are outfitted with these ratings systems. AHFC trains energy raters and home inspectors to monitor enforcement of these requirements.	0
Arizona	We currently have no detailed information on compliance rates in Arizona. Arizona's score is based on expert judgment on compliance rates.	1
Arkansas	The latest study completed to measure compliance was published in 2006 by the Arkansas Economic Development Commission. Results indicated that compliance with the code is increasing, but more attention was needed in the colder, northwest part of the state. Enforcement is a major issue that varies with each jurisdiction. Enforcement is more common in larger cities with greater resources, but the focus of building inspections tends to be on structural integrity, fire, water, and safety. Builders and code officials periodically receive training on code compliance, typically through the Code Officials of Arkansas and the AR Economic Development Commission.	0.5
California	No studies have been conducted or funding identified to establish a baseline of compliance in California. Enforcement is at the local level and there are building departments in each of the 536 city and counties. Online training is available at www.energyvideos.com. Utilities, the California Energy Commission staff and local organizations and trade groups provide training to these building departments as well as to contractors and homeowners.	2
Colorado	The Governor's Energy Office (GEO) recently completed the Building & Energy Code Survey Report, which presents the results of a July 2009 survey on building code enforcement and adoption, as well as a needs assessment for the types of code assistance desired in the 333 code jurisdictions. Results from the survey indicate that 80% of respondents (n=174) claim to be enforcing residential codes and 79% commercial codes, though this is not a measure of compliance. The GEO has provided over 45 trainings on the 2003/6/9 IECC over the past 1.5 years and has been providing training for the last 3 years. The survey indicates that 84% of respondents requested additional support from the state energy office on energy codes.	1.5
Connecticut	The Office of Education and Data Management (OEDM) has done a series of surveys in 2008-2009 on code training needs of local architects, designers, and building contractors to facilitate more uniform compliance. A baseline energy code compliance survey was conducted in late 2010 and early 2011 by OEDM with the Institute for Sustainable Energy at Eastern Connecticut State University, with results currently under review. Codes are enforced through the local building code enforcement official. The OEDM in conjunction with the Office of the State Building Inspector are responsible for the training and licensing of building code officials. Training is common as building inspectors must receive a minimum number of continuing-education credits per year. Once	1.5

State	Summary of State Building Code Compliance Efforts	Score
	licensed, code officials must attend 90 hours of code related continuing-education programs within a three-year cycle.	
Delaware	We currently have no detailed information on compliance rates in Delaware. Delaware's score is based on expert judgment on compliance rates.	1
District of Columbia	The codes are enforced by the codes division of the Department of Consumer and Regulatory Affairs (DCRA), which regularly trains its official on code updates.	1
Florida	No studies have been conducted that attempt to measure compliance rates in the state, though the state plans to perform a study measuring the relative building performance between the implementation of the 2007 Florida Building Code and the 2009 Supplement. Enforcement is done at the local level by building departments with code clarifications issued by the Building Officials Association of Florida (BOAF), while Declaratory Statements are issued by the Florida Building Commission. Building departments receive training at the annual BOAF conference. Code officials and those in the construction industry are also required to take continuing education courses. The Florida Solar Energy Center has a contract to develop a Train-the-Trainer program and online web training to radically expand the number of persons qualified on Florida's energy code.	1.5
Georgia	The most recent survey on compliance was conducted by the Department of Community Affairs in 2004, which showed that about 50% of counties were enforcing the Georgia State Energy Code, though the study did not actually measure compliance. Currently there is no organized training program, though a comprehensive state-wide training program is expected to begin in late 2010. Local jurisdictions may request training from the Department of Community Affairs' Construction Codes program. As one of the 24 states to receive funding from DOE for bolstering its compliance efforts as well as being one of the nine states to receive funding for a compliance pilot study, which is currently underway, the state has been able to make considerable progress in strengthening its overall compliance efforts.	1.5
Hawaii	The last study completed that measured compliance was done in 1999 and determined a compliance rate of 89%. Each of the four counties in HI has a Building Division within the Public Works departments. State government buildings and military housing voluntarily comply with the county codes. Code officials receive training when a new code is imminent, such as in 2009 when several counties were about to adopt the IECC 2006 or 2009.	1
Idaho	The last study measuring compliance in Idaho was conducted in 2008 and was based on the 2001 Idaho energy code, which at the time followed the 1997 Uniform Building Code. At the time, compliance was measured at 88%. Training is scheduled each year through the Idaho Building Official Association (IDBAO). The IDABO also holds a two-day course on IECC training every January while the Idaho Energy and Green Building Conference every October also has a two-day training course. In 2010 there will be six educational seminars for builders, designers, and code officials that will provide continuing education credits for members of the American Institute of Architects and IDBAO.	2
Illinois	Illinois recently completed a compliance study using a grant from the Department of Energy and contracting through the Midwestern Energy Efficiency Alliance; results are due in August 2011. Enforcement of codes is mandatory under state law and is enforced by local authorities. Training is provided by the Illinois Department of Commerce and Economic Opportunity through funding from the International Code Council.	1
Indiana	There are no recent studies that have attempted to measure compliance rates with the Indiana Energy Conservation Code. Codes are enforced at the state and local level for all buildings except single and dual-family dwellings, which are enforced only at the local level. Code officials receive training through their employment with the Division of Fire and Building Safety of the IN Department of Homeland Security. The Indiana Builders Association also provides training, and the Indiana Office of Energy and Defense Development has offered training sessions to several groups as well.	0.5

State	Summary of State Building Code Compliance Efforts	Score
Iowa	Enforcement takes place at the state and local levels. A 2009 survey determined enforcement varies from 0-40% of jurisdictions, though smaller jurisdictions often do not enforce codes. This survey, however, did not attempt to measure compliance. A recent grant from the American Recovery and Reinvestment Act from the Iowa Office of Energy Independence to the Iowa Department of Public Safety will allow for the hiring of an engineer and building inspector to start a more active approach to energy code enforcement in Iowa. There is no mandatory training program in Iowa, but the Iowa Association of Building Officials (IABO) provides several seminars each year on a variety of code enforcement topics. Investor Owned Utilities also provide some energy code training throughout the year. The State Building Code Bureau and IABO are planning to host three 2-day seminars throughout Iowa in the summer of 2010, which will provide specific energy code training to all code officials on the 2009 IECC.	1
Kansas	In 2010 the Kansas Energy Office surveyed 55 Kansas cities in an attempt to better understand the enforcement of the codes throughout the state. Results were mixed and did not reveal a specific percentage of compliance. There is no provision for enforcement, though as a home rule state, Kansas allows local jurisdictions to enact local regulations where a statewide standard does not exist. The Energy Efficiency Building Codes Working Group was set up in 2009 to ensure compliance with federal guidelines surrounding stimulus funds and plans to address the need for code training, the level of which varies across jurisdictions. Currently, the State does not play a direct role in training codes officials and builders about codes.	0.5
Kentucky	There are no recent studies that have attempted to measure code compliance in the state. Enforcement is done at the state and local level by building inspection departments. The Department of Housing, Building, and Construction co-sponsored 20 days of training in 2008, while the efforts of several independent groups likely increased that to 30 days.	1
Louisiana	There are no recent studies that have attempted to measure code compliance in Louisiana. Enforcement of the residential code is done by the Certified Building Official in each of the 64 parishes. Commercial codes are enforced by the Office of the State Fire Marshall. Code officials receive training through the International Code Council seminars and online courses. The Technology Assessment Division (TAD) travels statewide teaching code software targeted towards designers, builders, code officials, architects, engineers and owners, which can also count as continuing education credits. In 2009, 412 individuals attended TAD training programs. Building inspectors are trained through the Department of Natural Resources.	1
Maine	A study on compliance was conducted by the Maine Public Utilities Commission in 2008, though a copy of the study cannot be found on their website. Only towns with more than 2,000 residents are required to enforce the 2009 IECC. A training and certification program was launched simultaneously with the building energy code changes. All code officers are required to be certified and training is provided free of charge. Builders, architects and others are not required to be certified, but are encouraged to attend the training on a fee basis.	0.5
Maryland	There are no recent studies that have attempted to measure code compliance in Maryland. Codes are enforced by each local jurisdiction through their Department of Codes Enforcement and Permits and Inspections. Approximately 900 building inspectors from every jurisdiction, along with 400 architects and 300 building contractors are trained every year through the Department of Housing and Community Development.	0.5
Massachusetts	A 2006 study measured compliance with the MA State Building Code was completed by the BBRS and focused solely on the residential sector. In 2010 the Dept. of Energy Resources and the electric and gas program administrators teamed up to update the residential baseline study with a sample of 40 homes built to the IECC2006 code and another 40 built to the new IECC2009 code. Results will be published the latter half of 2011. The BBRS, Department of Energy Resources (DOER) and other partners are planning a pilot evaluation of residential energy performance and code compliance that intends to inform how states determine code compliance rates. Enforcement is performed by local	2

State	Summary of State Building Code Compliance Efforts	Score
	building code officials. In cities that have elected to adopt the state's 'stretch' energy code, enforcement of the building energy code is greatly assisted by the role of HERS raters. The BBRS has technical staff that provides advice and training to local code officials and works with regional organizations of local code officials to discuss enforcement issues. The state requires that all code officials fulfill a set of certification requirements in all aspects of construction and code enforcement, which includes continuing education through certified courses. The Green Communities Act requires the BBRS and the Department of Energy Resources to develop specific energy efficiency training and certification for all local code officials. Consequently, the DOER sponsored 40 trainings in 2010 on building energy codes and building science, and in 2011 these trainings have evolved into more practical 'Smart Building' trainings covering best practices for builders and code officials.	
Michigan	There are no recent studies that have attempted to measure code compliance in Michigan. Enforcement is under the auspices of the state government as established by the Stille-DeRossett-Hale Single State Construction Code Act, but governmental subdivisions may exempt themselves from state enforcement by setting up an enforcement agency themselves. Code officials are required to receive continuing education under the Building Officials and Inspectors Registration Act. A number of code official organizations provide regular training throughout the state. The Bureau of Construction Codes also provides code training.	0.5
Minnesota	There are no recent studies that have attempted to measure code compliance in Minnesota. Enforcement takes place at the local level. Training is provided in the spring and fall by the Department of Labor and Industry.	1
Mississippi	Because Mississippi has no statewide building energy codes, all residential and commercial codes are carried out at the local jurisdictional level. However, the Mississippi Development Authority's Energy Division has recently held workshops on building energy codes.	0
Missouri	We currently have no information on compliance rates in Missouri.	0
Montana	The Building Codes Bureau in the Department of Labor and Industry (L&I) is responsible for compliance checks within the commercial sector. The last study measuring compliance in Montana was conducted in 2008 by the Northwest Energy Efficiency Alliance and was based on the code enforced in 2001, which was ASHRAE 90.1-1989. At the time, compliance was measured at 47%. A residential code compliance study is currently underway; results will be available by November 2011. A residential code compliance study is currently underway with results due in the Fall of 2011. The Montana Department of Labor and Industry (L&I) coordinates code adoption and enforcement, although the residential energy code is enforced by the 46 local jurisdictions and most major cities enforce the energy code within their city limits. Builders are required to meet code requirements and show compliance through a builder self-certification process. Residential projects built outside of building code jurisdictional areas are not inspected, but the state provides information to builders to comply with code standards. L&I enforces compliance on commercial buildings and residences of more than 5 units that are located outside of jurisdictional areas. L&I provides some training, but the Department of Environmental Quality (DEQ) provides more training support in the form of workshops and on-site training sessions to code officials and builders. DEQ also participates with the state Building Codes Bureau in an annual code training conference on all ICC codes.	1.5
Nebraska	Nebraska is currently undertaking a baseline compliance study. Local jurisdictions that adopt and enforce an energy or thermal efficiency code are required by statute to adopt a code that meets or exceeds the minimum requirements of the Nebraska Energy Code. Otherwise, enforcement of the code falls to the Nebraska Energy Office. Since 2004, the NE Energy Office has provided energy code compliance and education opportunities across the state. More than 1,100 members of the state's construction industry have been trained on the code requirements. To date, in 2011 eleven trainings have been	1

State	Summary of State Building Code Compliance Efforts	Score
	provided from ICC, ASHRAE and other members of the building science community.	
Nevada	We currently have no detailed information on compliance rates in Nevada. Nevada's score is based on expert judgment on compliance rates.	1
New Hampshire	A Gap Analysis study was completed in 2011, which looks into the current state of code implementation and offers suggestions to increase compliance. The state is also in the process of conducing a statewide compliance study. Building codes are enforced at the local level by the municipality with the Public Utilities Commission (PUC) reviewing applications for many cities and towns. In 55 of New Hampshire's municipalities, the fire department handles building code enforcement, focusing mainly on life-safety issues. The PUC, in coordination with the state's regulated electric utilities, GDS Associates, and the state Office of Energy and Planning, conduct energy code trainings in the fall and spring that are designed to teach builders, designers, engineers, and building officials how to build to code and beyond. New Hampshire has also increased outreach and training to "nontraditional" audiences, such as realtors, appraisers, lenders, and insurers. The Office of Energy and Planning is developing a program on Building Code Compliance using stimulus funds, which will specifically develop and implement training programs for code officials to achieve 90% verifiable compliance by 2017.	1.5
New Jersey	There are no recent studies that have attempted to measure code compliance in New Jersey. Enforcement is done at the local level through permits and inspections. Code officials are required to take continuing education courses, and license renewal through the Department of Community Affairs is required every three years.	0.5
New Mexico	There are no current studies that have attempted to measure code compliance in New Mexico. Codes are enforced by the NM Regulations and Licensing Department and by local governments. Code officials receive training through the Construction Industries Division on a regular basis and there are plans to use stimulus funds to ramp-up these training programs.	0.5
New York	The New York State Research and Development Authority (NYSERDA) is developing Request for Proposals for baseline energy code studies in order to identify where the most improvement is needed. Building energy codes are enforced at the local level by municipalities through the process of building permit and inspection. Code officials are required to complete annual code update training, which includes a training component specific to the energy code. Additional training has been given throughout the state by the NYS Building Official's Conference, which is given by the NYS Code promulgation staff. Comprehensive energy code courses have been conducted statewide by ERS Energy Consultants. There are also plans to leverage stimulus funding to develop widespread energy code training courses.	2
North Carolina	There are no recent studies that have attempted to measure code compliance in North Carolina. Enforcement is the obligation of local jurisdictions through the permit/inspection process for new construction and additions. The NC Department of Insurance is responsible for the general supervision statewide. Appalachian State University and Mathis Consulting have coordinated to put together over 30 workshops over the past 3 years, targeting training for specific jurisdictions. The NC Department of Insurance also provides training as a part of its annual workshops for building inspectors and mechanical inspectors.	1
North Dakota	We currently have no information on compliance rates in North Dakota.	0
Ohio	The Ohio Energy Office conducted a study measuring enforcement in 2005, although there are no recent studies that have attempted to measure code compliance in Ohio. The Ohio Board of Buildings Standards (BBS) adopts statewide energy codes and certifies the building departments and the personnel working for the departments throughout the state who enforce the codes. Code officials are required to take 30 hours of continuing education every three years to maintain their certification. There are other optional energy code courses that have been approved by the BBS so that the code officials can receive continuing education credits to be used to fulfill their 30-hour requirement, which includes an online energy code course.	0.5

State	Summary of State Building Code Compliance Efforts	Score
Oklahoma	There are no recent studies that have attempted to measure compliance rates in Oklahoma. Because Oklahoma is a "home rule" state, enforcement is the onus of the municipality that has adopted an energy code. Code officials are trained by the Oklahoma Construction Industry Board (CIB). The Inspectors Examiners Committee has the authority to "assist" the CIB in establishing licensing, performance, continuing educations and other requirements for inspectors. Because Oklahoma has not yet adopted statewide energy codes, training is coordinated by municipalities instead of at the state level.	0.5
Oregon	In 2011, the Building Codes Division (BCD) conducted a preliminary 90% compliance study through the Northwest Energy Efficiency Alliance to review compliance and quality of energy codes in the state. Results have not yet been put into a final report format. A study on compliance in Oregon was conducted in 2008, as well, by the Northwest Energy Efficiency Alliance (NEEA) and was based on the code enforced in 2001. At the time, compliance was measured at 93%. The Oregon Building Codes Division Enforcement Program works with local jurisdictions to emphasize proper compliance. All jurisdictions are required to perform plan review, inspections and enforcement – without the ability to amend the state promulgated codes. BCD provides guidance and statewide interpretations to ensure consistent enforcement of the code throughout the state. All Building Officials are required to be certified by the State and complete 16 hours of continuing education every three years. A variety of training formats and venues are made available directly through BCD and others through partners such as the Oregon Building Officials Association (OBOA) and Oregon Homebuilders Association (OHBA). In addition, NEEA has developed and is presenting a modified version of the BCD energy code training.	2
Pennsylvania	There are no recent studies that have attempted to measure compliance rates in Pennsylvania. Enforcement is done by certified individuals who are either state employees, municipal employees or who work for certified third-party agencies that have been retained by municipalities. Code officials receive training in anticipation of passing the exams required to obtain initial certification and must engage in continuing education.	1
Rhode Island	Rhode Island is in the process of doing a baseline compliance study for the state with National Grid. Enforcement is done by the code officials in local jurisdictions, while the State Building Commissioner enforces the code for all state buildings. The RI Department of Administration has recently set up a schedule for mandatory training for building officials.	1
South Carolina	We currently have no information on compliance rates in South Carolina.	0
South Dakota	In pursuance of ARRA requirements, the state completed a report that lists recommendations for maximum compliance. Additionally, a December 2010 gap analysis was completed to analyze code adoption and recommend actions to achieve higher compliance. However, no studies measure compliance rates in the state. Enforcement is done at the local level. The Office of the State Engineer does contractually require building energy code compliance for state owned building projects. State government is not involved in training of local code officials or builders.	0
Tennessee	No studies have been completed to measure compliance rates in the state. The Tennessee Department of Commerce and Insurance has the authority to enforce residential energy codes and has conducted training for staff and local governments. Energy Codes Training and Enforcement programs are underway at the Tennessee Codes Enforcement Academy and the Department of Commerce and Insurance is in the process of establishing an on-line code training website, which will include energy code compliance. The Department has provided over 1,400 hours of IECC training for 235 code officials and is also initiating a web-based "Codes College" to provide computer-based codes training, particularly energy codes training, to officials and homebuilders.	1
Texas	In 2011, Texas BCAP released a study on compliance in the state that found uneven performance and presented a range of ideas to improve compliance. Texas is a home rule state, so enforcement is done by local jurisdictions. Local jurisdictions also decide the code compliance training requirements for their code officials. SECO is in charge of code compliance for state-owned buildings.	0.5

State	Summary of State Building Code Compliance Efforts	Score
	Builders are not required to take training since the Texas Residential Commission was dismantled. City building officials have to keep their certifications by CEUs, but it is not mandated by the state.	
Utah	Utah participated in a compliance pilot study in 2011 using PNNL methodology that showed, with limited numbers), compliance above 80% for residential and commercial buildings (both new and renovated). Local jurisdictions are obligated to enforce the adopted state codes. The Utah State Energy Program has been conducting energy code education since 2007. The free trainings have been made available across the state in more than 40 half- or full-day sessions. The free trainings were scheduled to continue in 2010 with an additional 8 full-day sessions, 7 hour-long webinars, and up to 4 special presentations for industry association meetings. The Office of Energy Development continues to provide training through Utah utility DSM funding. Additionally, grant funds from DOE/PNNL have allowed for increased training and personnel in 2011. The governor's 2011 energy plan includes increased energy code education as a way to raise public awareness and to treat energy efficiency as a resource. Lastly, the Utah Building Energy Efficiency Strategies Partnership (UBEES), an ARRA funded program, established a monthly "Code Compliance Capitol Morningsides Trainings". These two hour trainings are available as a webcast or in person and have received numerous Energy Star awards.	2
Vermont	There are no current studies that have attempted to measure compliance rates in Vermont, but one is expected to be released in January 2012. New construction is required to be code compliance, but the compliance with the residential code is not required to be filed anywhere while compliance with the commercial codes is required to be affixed to the heating system and filed with the Department of Public Service. The Department of Public Service provides training to builders in conjunction with the Department of Public Safety. There are no code officials and there is no standard training.	1
Virginia	A statewide building compliance study is scheduled to be completed by June 2012. Enforcement is done by local building departments. The Department of Housing and Community Development conducts 3 days of code training every three years for the new codes and any changes. Local seminars occur more frequently. Each technical assistant goes through 3 days of training for each certification they hold and all must take 16 hours of continuing education every two years.	1.5
Washington	The last study measuring compliance in Washington was conducted in 2008 by the Northwest Energy Efficiency Alliance 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%. Enforcement is done through local jurisdictions. Training is up to local jurisdictions, where local trade associations and code chapters provide training for their members. Typically energy code trainings are contracted to Washington State University and the Northwest Energy Efficiency Council for instructors, and the Washington Association of Building Officials (WABO) offers some training sessions each year.	2
West Virginia	There are no current studies that have attempted to measure compliance rates in West Virginia. Enforcement is done by local planning offices throughout West Virginia. The WV Division of Energy has historically provided the only energy code training in the state.	1
Wisconsin	There are currently no studies that have attempted to measure compliance rates in WI due mostly to statewide requirements for inspection of all new buildings. However, the state did receive funding from the Department of Energy to implement a pilot study of compliance in commercial buildings; this study is not yet completed. All licensed UDC and WI Commercial Building Inspectors are required to obtain continuing education credits in order to renew their license. Each late winter/early spring, the 4 inspector associations put on training, but it is not mandatory. The Department of Commerce offers various training courses throughout the year, which are also not mandatory. Some courses are available online, others are addressed by organizations such as WI Focus on Energy, Energy Center of WI, WI Builders Association and others.	1.5

State	Summary of State Building Code Compliance Efforts	Score
Wyoming	There are no current studies that have attempted to measure compliance rates in Wyoming. Local jurisdictions that are established as local enforcement may, but are not required to, enforce energy codes at the local level. As a result of a partnership between the State Energy Office (SEO) and the Wyoming Conference of Building Officials, a 2009 Energy Codes Fundamentals course was held around the state. The SEO contracted with ICC to conduct those trainings. As a follow-up the SEO requested ICC to customize two one-day courses focused toward the designer community and the contractor community. Those trainings were held in June of 2011.	0