THE 2009 STATE ENERGY EFFICIENCY SCORECARD

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The 2009 State Energy Efficiency Scorecard

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EXECUTIVE SUMMARY

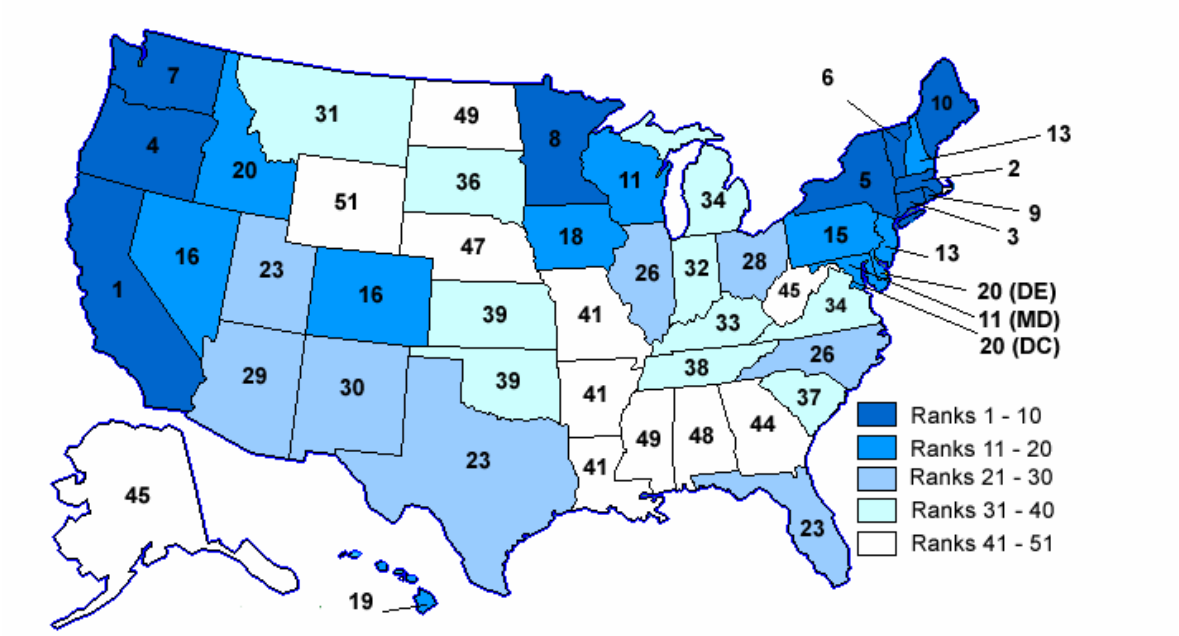
Introduction

In 2009, energy efficiency has risen to a new level of recognition in the U.S. It is a core component of the American Recovery and Reinvestment Act (ARRA) and is a resource that is increasingly being called upon at the state level. This heightened awareness demonstrates that energy efficiency — the kilowatt-hours and gallons of gasoline that we don't use due to improved technology and practices — is accurately being recognized as the cheapest, cleanest, and quickest energy resource to deploy. In the race for clean energy resources, states are adopting aggressive energy efficiency policies, increasing investments in efficiency programs, and improving efficiency in their own facilities and fleets. While some states have been making commitments toward energy efficiency for decades, others are just getting started in a big way, while still others have yet to tap this energy resource. We present here a comprehensive state energy efficiency scorecard to document best practices and recognize leadership among the states. The scorecard can serve as a means of benchmarking state efforts, with the goal of encouraging states to continue to raise the bar in efficiency commitments and providing a roadmap for states that want to catch up to the leaders.

This report is the third edition of ACEEE's *State Energy Efficiency Scorecard*, which provides a comprehensive approach to score and rank states on the adoption and implementation of energy efficiency policies and programs. The Scorecard examines six state energy efficiency policy areas and presents these results in six chapters: (1) utility-sector and public benefits programs and policies; (2) transportation polices; (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 impact on energy savings.

Readers should note that the base year for policy assessment in the Scorecard varies by the policy area examined. For example, utility-sector energy efficiency programs are assessed on performance in 2007 (the most recent data available from all states on actual spending figures) along with enabling utility-sector policies in place in 2009. Most other categories are based on the current status of policies in 2009.

Figure ES-1. Map of State Energy Efficiency Scorecard Results



Note: Several states have the same score and are tied for the same ranking.

Summary of Rankings

Figure ES-1 shows state rankings and classifies states and the District of Columbia into five bins. 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.

Readers should note that although we provide individual state rankings, in terms of measuring commitment to energy efficiency, the difference between rankings is most significant among bins of every ten or fifteen ranks rather than individual scores. For example, the difference between states listed in the "top ten" is much less significant than the difference between the tier of top ten and the second or third quintile. Figure ES-1 and Table ES-1 sort the state rankings in five "bins," which is the best way for readers to interpret the results of the Scorecard.

The top ten states, as shown in Table ES-2, earn at least 25 out of the possible 50 points, with California, Massachusetts, and Connecticut taking the top three spots with 44.5, 39, and 37.5 points, respectively. Each of the next three bins of states earn between 7.5 and 24 points, while states in the lowest bin score 7 points or less.

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

Rank	State	Utility and Public Benefits Efficiency Programs and Policies Score	Transportation Score	Building Energy Code Score	Combined Heat and Power (CHP) Score	State Government Initiatives Score	Appliance Efficiency Standards Score	TOTAL SCORE	Change in Rank from 2008 Results
	Maximum Possible Points:	*20*	*8*	*7*	*5*	*7*	*3*	*50*	
1	California	18.5	6	7	5	5	3	44.5	0
2	Massachusetts	17	4	7	4	5	2	39	5
3	Connecticut	17	5	4	5	4.5	2	37.5	0
4	Oregon	14	5	6	5	4.5	2	36.5	-2
5	New York	14	5	4.5	5	5	1	34.5	0
6	Vermont	19	4	3.5	2	4	1	33.5	-2
7	Washington	14	6	6	3	2	2	33	-1
8	Minnesota	16.5	2	5	3	4	0	30.5	-1
9	Rhode Island	13	4	5.5	1	2	2	27.5	2
↑10	Maine	8.5	4	5.5	4	4	0	26	9
11	Wisconsin	11	1	4	4	4	0	24	-2
11	Maryland	5.5	5	5.5	3	3	2	24	1
13	New Hampshire	11	0	5.5	2	4	1	23	5
13	New Jersey	9.5	5	3.5	4	1	0	23	-3
15	Pennsylvania	3	4	6	4	5	0	22	0
↑16	Colorado	11	1	3	3	3	0	21	8
16	Nevada	11	0	4	2	3	1	21	-1
18	Iowa	13	0	4	0	3	0	20	-4
19	Hawaii	11.5	1	1.5	3	2	0	19	-4
20	Idaho	8.5	0	5	2	3	0	18.5	-7
↑20	Delaware	4.5	3	5	3	3	0	18.5	12

Rank	State	Utility and Public Benefits Efficiency Programs and Policies Score	Transportation Score	Building Energy Code Score	Combined Heat and Power (CHP) Score	State Government Initiatives Score	Appliance Efficiency Standards Score	TOTAL SCORE	Change in Rank from 2008 Results
↑20	District of Columbia	1.5	4	6	4	2	1	18.5	10
23	Florida	4	1	5.5	3	3	0	16.5	-4
23	Utah	9.5	0	4	1	2	0	16.5	2
23	Texas	5.5	0	3	5	3	0	16.5	-4
28	Illinois	4	0	3.5	5	3.5	0	16	-7
26	North Carolina	4.5	0	4.5	3	4	0	16	2
26	Ohio	5	0	3.5	5	2	0	15.5	-9
29	Arizona	6.5	4	0.5	1	2	1	15	-1
30	New Mexico	5	2	3.5	2	2	0	14.5	-5
31	Montana	6.5	0	3	1	3	0	13.5	-4
32	Indiana	3.5	0	1.5	4	3	0	12	6
33	Kentucky	4.5	0	4	1	2	0	11.5	-2
34	Virginia	1.5	1	4.5	0	3	0	10	-2
34	Michigan	2.5	0	3.5	2	2	0	10	4
↑36	South Dakota	4.5	0	0	3	1.5	0	9	11
37	South Carolina	2.5	1	3	1	1	0	8.5	-3
↑38	Tennessee	2	2	1	1	2	0	8	8
39	Kansas	2	0	1.5	1	3	0	7.5	-1
39	Oklahoma	1.5	1	2	1	2	0	7.5	4
41	Arkansas	1	0	4	2	0	0	7	-3
41	Missouri	1.5	0	1	2	2.5	0	7	4
41	Louisiana	0	1	3	0	3	0	7	-6
44	Georgia	1.5	1	4	0	0	0	6.5	-8
45	Alaska	0	1	2	2	1	0	6	-8
45	West Virginia	0	0	3	1	2	0	6	-2
47	Nebraska	0.5	0	2	1	1	0	4.5	-9
48	Alabama	0	0	0	1	2	0	3	1
49	Mississippi	0	0	0	1	1	0	2	-2
49	North Dakota	1	0	0	1	0	0	2	0
51	Wyoming	1	0	0	0	0	0	1	0

↑ denotes most improved states. Note: We do not score the U.S. territories due to lack of data, though hope to expand the Scorecard in the future to include them in the rankings.

Change from Last Year's Scorecard

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. The 2009 "top ten" are mostly the same as in the 2008 Scorecard, with Rhode Island and Maine being the newcomers to enter these top rankings, and Wisconsin and New Jersey sliding down a couple of spots. These states lead the country in energy efficiency through best practices in most of the six categories, including successful implementation of utility efficiency programs, transportation efficiency policies, and building energy codes. For example, nine of the states in the top

ten also rank in the top ten of the utility and public benefits programs and policies chapter, and seven of the top ten also rank among the highest in terms of transportation policies, while five of them rank the highest with regards to building energy codes.

Table ES-2. Top Ten States for the 2009 and 2008 Scorecards

2009 Edition		2008 Edition	
1	California	1	California
2	Massachusetts	2	Oregon
3	Connecticut	3	Connecticut
4	Oregon	4	Vermont
5	New York	5	New York
6	Vermont	6	Washington
7	Washington	7	Massachusetts (tie)
8	Minnesota	7	Minnesota (tie)
9	Rhode Island	9	Wisconsin
10	Maine	10	New Jersey

"Most Improved" States

Overall, states have shown improvement in scores since last year's Scorecard. This year's average score, for example, is 17 points compared to 15 points last year. We classify the following states as "most improved" because their ranking moved up 8 spots or more: Maine, Delaware, District of Columbia, Colorado, Tennessee, and South Dakota. Maine, for example, moved up 9 spots and into the 'top ten' due to a variety of increased efforts, including those of Efficiency Maine (the agency which delivers energy efficiency programs), adoption of building energy codes, land-use planning management, and other activities. Delaware moved up 12 spots to tie at 20th. The state recently established the Delaware Sustainable Energy Utility (SEU) as the nonprofit entity that will deliver energy efficiency services to its households and businesses. These most improved states have all expanded their efforts through various means, such as committing more funding to energy efficiency programs, setting long-term and aggressive energy savings goals, or making commitments to improve the efficiency of their own facilities and fleets. Readers should note that while some movement can be attributed to states advancing or expanding their suite of energy efficiency policies, some changes in rank are due to minor changes in our scoring methodology since last year's Scorecard, such as expanding point allocations to transportation policies.

Table ES-3. "Most Improved" States since 2008 Scorecard

State	Change in Ranking
Maine	19th ↑ 10th
Colorado	24th ↑ 16th
Delaware	32nd ↑ 20th
District of Columbia	30th ↑ 20th
South Dakota	47th ↑ 36th
Tennessee	46th ↑ 38th

Major Recent Developments

In addition to the significant strides we have seen from states on energy efficiency policies that are reflected in this year's rankings, we are also seeing signs of the major efforts states are making that will be reflected in next year's Scorecard. For example, several states including Michigan, Pennsylvania, Ohio and Delaware passed legislation in late 2008 or the first half of 2009 establishing Energy Efficiency Resource Standards (EERS), which set binding energy savings goals for utilities. Also, in Massachusetts

the Energy Efficiency Advisory Council has given approval to targets that would triple participation in electricity efficiency programs. These targets will improve energy efficiency commitments in these states in the near future. The EERS targets earn credit on the Scorecard as an enabling policy for utility-sector energy efficiency (Chapter 1), however, because this chapter largely covers data on efficiency program spending and savings for 2007, which is the last year with available data for all states, many of these recent efforts will not be fully captured in the data for a couple of more years. Major increases in utility-sector efficiency program spending are also underway in Illinois and North Carolina, for example, though 2007 program data does not yet reflect these changes. And this growth will likely continue into the next decade. A recent analysis of state-level energy efficiency policies estimates that ratepayer-funding for electric and natural gas energy efficiency programs will rise from $3.1 billion in 2008 to between $5.4 billion and $12.4 billion by 2020 (Barbose, Goldman, and Schlegel 2009).

State Feedback Methodology

This year we directly reached out to state-level stakeholders to verify the accuracy and comprehensiveness of the policy information on which we score the states. In August 2009, for example, officials at state energy offices and public service commissions were given the opportunity to review material on the ACEEE *State Energy Efficiency Policy Database* (see www.aceee.org/energy/state), which is used to develop this Scorecard report. Twelve state energy offices responded with comments as well as regional nonprofits and other state-level organizations. Stakeholders were also invited to review a draft of the Scorecard report. States can be actively engaged in the scoring process by providing the most accurate and up-to-date information on energy efficiency policies and programs throughout the calendar year.

Energy Efficiency Performance Metrics by Humboldt State University

In addition, we add a new section to the Scorecard that characterizes state energy consumption trends as another means to reflect energy efficiency performance. This section is presented in Chapter 7, prepared by Humboldt State University and NRDC, and discusses a methodology for an aggregate, state-level metric of energy consumption intensity (ECI) in the residential sector and provides summary results for each of the lower 48 states. The methodology provides a tool for identifying 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 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 included in the overall state rankings of this Scorecard, but rather as an exploratory exercise in measuring energy consumption trends as a means of understanding energy efficiency. Importantly, the approaches can be used to complement each other, as the ACEEE Scorecard is a measure of state energy efficiency policy while this approach is a measure of progress in achieving reductions in energy consumption intensity.

Conclusion

In 2009, states continue to lead the nation in advancement of energy efficiency policies and programs. This Scorecard serves to recognize and document these important contributions, both to encourage other states to follow and to inform ongoing energy and climate federal policy discussions about effective energy efficiency policy solutions. Energy efficiency is the only resource that can actually *reduce* energy consumption to combat rising energy demand and create a hedge against rising energy prices — making efficiency the "first fuel" states can use to balance their energy portfolios.

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INTRODUCTION

Since the 1970s, states have rapidly outpaced the federal government in both spending commitments to energy efficiency and adopting landmark efficiency policies, including appliance and equipment efficiency standards, building energy codes, and energy efficiency resource standards. As more and more states turn to energy efficiency as the "first fuel" in the race for clean and secure energy resources, it is important to document best practices and recognize leadership among the states. Doing so both provides practical models for other states to follow and encourages federal action to catch up with and complement state efforts. With that goal in mind, we developed the third edition of this report.

ACEEE has a history of state scorecards that highlighted utility-sector spending and savings data for energy efficiency programs. The first reports analyzed utility spending on energy efficiency programs in each state, including the *State Scorecard on Utility Energy Efficiency Programs* (Nadel, Kubo, and Geller 2000), a 2002 update (York and Kushler 2002), and *ACEEE's 3rd National Scorecard on Utility and Public Benefits Energy Efficiency Programs* (York and Kushler 2005).

In 2007, ACEEE released *The State Energy Efficiency Scorecard for 2006* (Eldridge et al. 2007), the first of its kind to provide a comprehensive approach to scoring and ranking states on energy efficiency policies. Due to the broad interest in the 2007 report and the continued demand for a state-by-state comparison on energy efficiency, we have continued to update the report on an annual basis and present this report as its third edition.

In the report, we first discuss the methodology for scoring states and some caveats. Compared to the 2008 Scorecard, we have consolidated some of the chapters and incorporated some minor changes into the scoring methodology (see Methodology below). We then present the detailed results in six chapters, one for each of the policy areas that we review:

1. Utility and Public Benefits Programs and Policies
2. Transportation Policies
3. Building Energy Codes
4. Combined Heat and Power (CHP)
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 the Discussion and Conclusions. In these sections, we review how several states' rankings have changed compared to the 2008 Scorecard. By comparing with last year's results, we hope to highlight the most improved states and thus present them as models for other states that are just beginning to implement energy efficiency strategies.

METHODOLOGY

Scoring

To score states on energy efficiency, we have identified six overall policy areas pursued recently in several states that both promote energy efficiency. This set of policies works to procure funding for efficiency, set long-term energy savings targets, reduce market and regulatory barriers, establish mandatory codes and standards, and increase public visibility of energy efficiency as an energy resource. 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 recent state and regional studies that have evaluated the relative energy savings impacts from state-level policies (WGA 2006; Elliott et al. 2007a, 2007b; SWEEP 2007). For example, the energy efficiency potential studies we have reviewed found that utility-sector 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-sector program 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**
Spending on Efficiency Programs (electricity)	5
Annual Savings from Efficiency Programs (electricity)	5
Spending on Efficiency Programs (natural gas)	3
Targets (Energy Efficiency Resource Standards)	4
Utility Incentives/Removal of Disincentives	3
2. Transportation Policies	**8**
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 Deployment	2
6. Appliance and Equipment Efficiency Standards	**3**
Maximum Total Score	**50**

Within each policy category, we then develop a scoring methodology based on a subset of criteria and assign 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.

Changes in Scoring

Our 2009 update is largely similar to the scoring methodologies of last year's report. There are, however, a couple of changes. First, we have increased the allocation of points to the transportation policy area (Chapter 2) from six to eight points. This change reflects the large potential for energy savings from the transportation sector. One study estimates that about 30% of the possible carbon dioxide emission reductions from state-level efficiency policies could come from transportation policies (SWEEP 2007). However, because most of the state policy efforts needed to achieve these levels of savings have not yet been implemented, we do not allocate 30% of the Scorecard points to transportation to account for the fact that even the best states aren't coming close to the potential energy savings in the transportation sector. See Chapter 2 for a discussion of transportation efficiency policies.

Last year, we expanded the scoring for Building Energy Codes (Chapter 3) to include a score for compliance and enforcement, compared to 2007 when we only ranked states on code stringency. National studies have shown that only about 50 percent of homes and buildings are compliant with energy codes (BCAP 2005). The introduction of this new metric increased the total number of points possible for the policy category, emphasizing the important role of both stringent and enforced state codes. We note, however, that measuring energy code compliance is difficult because states do not have the funding to collect the vast amount of data needed to estimate the state's level of compliance. Last year we scored states on a scale of zero to three for code compliance and surveyed national experts to score the states. This year, we improved this effort by surveying individual contacts in each state to collect any information on studies or surveys of building code compliance that have been completed and the extent of training available to code officials, builders, and contractors. These metrics are steps toward greater building energy code enforcement and compliance. This year we also have rolled back the total possible points in this category from three to two points to acknowledge the imperfect nature of our scores compared to actual rates of code compliance. We present these scores, however imperfect, in order to recognize the crucial role of building code enforcement and compliance.

Third, we slightly changed our methodology for scoring utility-sector natural gas efficiency program spending. Rather than normalizing spending to natural gas end-use consumption in the state, which tended to favor states with low customer natural gas use, this year we normalize consumption to population in the state, giving a 'per-capita' figure for natural gas efficiency program spending.

Finally, we have consolidated the following three policy and program categories into Chapter 5: "State Government Initiatives": Financial and Information Incentives; Lead by Example in State Facilities and Fleets; and Research, Development and Deployment. Whereas energy efficiency programs at the state-level have typically been administered through the utility sector or a public benefits fund framework, a growing number of initiatives are being planned and administered through state entities. The scoring for these categories remains unchanged since last year; however, the consolidation into one chapter aims to reflect this emerging area of state-level energy efficiency activity.

State Feedback Methodology

This year we also reached out to state-level stakeholders to verify the accuracy and comprehensiveness of the policy information on which we score the states. Officials at state energy offices were given the opportunity in August to review the material on the ACEEE State Energy Policy Database[1] Web page by September 1. Twelve state energy offices responded with comments, including Alabama, Connecticut, Delaware, Indiana, Iowa, Nebraska, New Hampshire, New York, Ohio, South Dakota, West Virginia, and Wisconsin. Regional nonprofits and other state-level organizations also contributed to the review process for Colorado, New Jersey, New Mexico, Texas, and Wisconsin. By providing more accurate and up-to-date information, eleven states improved their score in the rankings by engaging in this process.

We reached out again to the same group of stakeholders in September by distributing a draft version of the Scorecard report and requesting feedback. Several state-level and regional contacts provided additional data and information on policies at this point in the process.

Data Caveats

The scoring framework described above 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. In that light, we present here several important caveats for the reader to note.

[1] See www.aceee.org/energy/state.

Spending ($) and Savings (MWh and MMCf)

When available, "hard" data on verified energy savings by state is one of the best metrics for scoring states on energy efficiency. As presented in Chapter 1, some of these data are available for utility-run and third-party-operated statewide programs designed to increase electricity end-use efficiency. An additional data set is spending on programs, which also shows actual commitments to program efforts, though it does not capture how successful programs are in converting dollars spent into actual energy saved. For electric efficiency programs, we provide data for both annual spending and annual savings for 2007. For gas programs, however, we only provide 2007 natural gas spending data because savings data is not available from a national clearinghouse and most states do not report the data.

Providing 2007-year program data on spending and savings is an obvious limitation for a 2009 policy Scorecard. However, these data are the most recent available from the Energy Information Administration (EIA) for electric programs and not all states were able to provide 2008-year spending for our state-by-state survey. Readers should note that many states have increased spending in 2008 and have plans to dramatically escalate program efforts in 2009. While the spending and savings data do not capture these plans, the energy savings targets (also known as Energy Efficiency Resource Standards or "EERS") category does capture aggressive state efficiency goals.

The Consortium for Energy Efficiency's (CEE) *Annual Industry Report*[2] on the energy efficiency industry is another source of information for state-level data on energy efficiency funding. The report tracks budgets for electricity and natural gas budgets in the U.S. and Canada. See Chapter 1 for a clarification of how ACEEE data on utility-sector energy efficiency programs differs from CEE's *Annual Industry Report.*

"Best Practice" Policy Metrics

Most of the energy efficiency policy areas, unlike the utility and public benefits programs, do not have reported savings or spending data that can be attributed to a particular policy action. 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 these policies. For building energy codes, we rank states according to the level of stringency of their residential and commercial codes. Similar legislation and regulations, however, do not always result in comparable energy savings. If two states have the same building energy code, but one state has twice the level of code compliance, then energy savings attributed to the policy would therefore be twice as great. This year's Scorecard attempts to capture some of these differences in building code compliance by reviewing state activity on code compliance surveys and training code officials to improve enforcement. This methodology does not compare actual compliance survey results, though the lack of data on building compliance forced us to develop this alternative approach. In doing so, we hope to encourage states to conduct streamlined compliance evaluations and training for code officials, builders, and contractors, and we hope to rely increasingly on such studies in the future for our scoring methodology. See Chapter 3 for a discussion of building energy codes and compliance.

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. The tiers of ten, as presented in Figure ES-1, are therefore the best way to interpret the results of the Scorecard.

[2] See www.cee1.org/ee-pe/2008/.

CHAPTER 1: UTILITY AND PUBLIC BENEFITS PROGRAMS AND POLICIES

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Background and Methodology

A wide range of state energy efficiency policies and program efforts are targeted toward or occur in the utility sector and/or "public benefits" energy programs, which assigned organizations in many states with the responsibility of administering and delivering energy efficiency programs. For this category, we score states both on performance metrics (i.e., program spending and energy savings results from 2007-year programs, which is the most recent data available from all states on actual spending and savings results) and enabling policies (energy savings targets and performance incentives as of September 2009). The five subsets to this policy category are:

1. Electricity Program Spending in 2007
2. Incremental Electricity Program Savings in 2007
3. Natural Gas Program Spending in 2007
4. Energy Savings Targets
5. Utility Incentives and Removal of Disincentives

Combined, a state can earn up to 20 points from demand-side efficiency program scoring, or 40% of the total possible 50 points, which studies suggest is this policy area's contribution to total potential energy savings. Among efficiency programs, one study suggests that electric programs are achieving three times as much primary energy savings as natural gas programs (SWEEP 2007). We thus allocate 10 points of this category to electric program metrics (annual spending and savings data) and 3 points to natural gas program metrics (annual spending). Savings data for natural gas programs are not tracked through a national clearinghouse and are not readily reported by states, so we therefore do not include these data in the scoring. Spending and savings data are reported for programs run in 2007 because these are the most recent data available for all 50 states on actual spending and savings results. Supporting policies, such as mandatory energy savings targets and utility incentives and removal of disincentives, are also critical to leveraging energy efficiency funding and encouraging savings. Combined, 7 points are allocated to these supporting state policies to emphasize their role in encouraging efficiency and to capture recent activity that is not otherwise covered by 2007 spending and savings data. See Table 2 for a summary of state scoring in the five subsets to this policy category.

Data for this category comes from a number of sources, principally ACEEE's recent national survey of utility-sector efficiency programs, data from the Energy Information Administration (EIA 2008) and Consortium for Energy Efficiency (CEE 2007, 2008), an ACEEE study on utility incentives and removal of financial disincentives (Kushler, York, and Witte 2006) with updates from several sources, and selected state and utility program annual reports and related documents.

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

State	Electricity Program Spending	Electricity Savings	Gas Program Spending	Targets (Energy Efficiency Resource Standards)	Utility Incentives and Removal of Disincentives	TOTAL SCORE	Ranking
Maximum Possible Points:	***5***	***5***	***3***	***4***	***3***	***20***	***NA***
Vermont	5	5	2	4	3	19	1
California	5	5	2.5	3	3	18.5	2
Connecticut	5	5	1	3	3	17	3
Massachusetts	3.5	4	3	4	2.5	17	3
Minnesota	4	3.5	2.5	4	2.5	16.5	5
New York	4	2	1	4	3	14	6
Washington	5	3.5	1.5	2	2	14	6
Oregon	5	4.5	2.5	0	2	14	6
Rhode Island	4.5	4	1.5	1	2	13	9
Iowa	3.5	3.5	3	3	0	13	9
Hawaii	2	5	0	3	1.5	11.5	11
Wisconsin	3	3.5	1.5	0	3	11	12
Colorado	1.5	2	1	4	2.5	11	12
Nevada	2.5	3.5	0.5	2	2.5	11	12
New Hampshire	3.5	3.5	1.5	0	2	10.5	15
Utah	2.5	2.5	3	0	1.5	9.5	16
New Jersey	3	2	3	0	1.5	9.5	16
Idaho	3	2.5	1	0	2	8.5	18
Maine	3	4.5	0.5	0	0.5	8.5	18
Arizona	2	2.5	0	0	2	6.5	20
Montana	2	2	1.5	0	1	6.5	20
Maryland	0.5	0	0	3	2	5.5	22
Texas	2.5	1	0	1	1	5.5	22
Ohio	1	0	0.5	2	1.5	5	24
New Mexico	1	0.5	1	2	0.5	5	24
Kentucky	1.5	0	0.5	0	2.5	4.5	26
Delaware	0	0	0	4	0.5	4.5	26
South Dakota	2	0	1.5	0	1	4.5	26
North Carolina	0.5	0	0.5	1	2.5	4.5	26
Florida	1.5	1	1	0	0.5	4	30
Illinois	0	0	0	3	1	4	30
Indiana	0.5	0	1	0	2	3.5	32
Pennsylvania	0	0	0	3	0	3	33
South Carolina	1	0	0	0	1.5	2.5	34
Michigan	0	0	0	2	0.5	2.5	34
Tennessee	1.5	0.5	0	0	0	2	36
Kansas	1	0.5	0	0	0.5	2	36
Virginia	0	0	0	0	1.5	1.5	38

State	Electricity Program Spending	Electricity Savings	Gas Program Spending	Targets (Energy Efficiency Resource Standards)	Utility Incentives and Removal of Disincentives	TOTAL SCORE	Ranking
Missouri	0	0	0.5	0	1	1.5	38
District of Columbia	0	0	0	0	1.5	1.5	38
Georgia	0	0	0	0	1.5	1.5	38
Oklahoma	0	0	0	0	1.5	1.5	38
Arkansas	0	0	0	0	1	1	43
Wyoming	0	0	0	0	1	1	43
North Dakota	1	0	0	0	0	1	43
Nebraska	0.5	0	0	0	0	0.5	46
Alaska	0	0	0	0	0	0	47
Alabama	0	0	0	0	0	0	47
Mississippi	0	0	0	0	0	0	47
West Virginia	0	0	0	0	0	0	47
Louisiana	0	0	0	0	0	0	47

Spending in 2007 on Electricity Efficiency Programs

The structure and delivery of ratepayer-funded electric energy efficiency programs[3] have changed dramatically over the past decade, 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-utility organizations, however. In quite a few cases there is a public benefits funding mechanism, but this goes 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. For 2007, we found that total spending on electricity ratepayer-funded programs reached $2.2 billion (see Table 4), up from about $1.6 billion in 2006. Combined with natural gas program spending of about $300 million, discussed later in this chapter, we estimate national spending of about $2.5 billion on efficiency programs in 2007. And this growth will likely continue over the next decade.

[3] 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.

A recent analysis of state-level energy efficiency policies estimates that ratepayer-funding for electric and natural gas energy efficiency programs will rise from $3.1 billion in 2008 to between $5.4 billion and $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 increased spending coming from states that have been relatively minor players in the industry (e.g., Illinois, Michigan, North Carolina, Ohio, and Pennsylvania).

The Consortium for Energy Efficiency's (CEE) *Annual Industry Report*[4] is another source for state-level data on energy efficiency funding. The report tracks budgets for electricity and natural gas efficiency programs in the U.S. and Canada. According to the 2007 and 2008 editions of the report, the total annual U.S. energy efficiency budget for electricity and natural gas programs in 2007 and 2008 were $2.6 billion and $3.1 billion,[5] respectively (CEE 2007, 2008). Readers should note a few key differences between the ACEEE data set provided in this section of the Scorecard and the CEE industry data: (1) CEE tracks *budgets* whereas ACEEE has looked at *actual spending*; (2) in addition to electricity efficiency programs, CEE also includes natural gas spending, load management, and low-income program spending. ACEEE separately tracks natural gas spending, does not include load management, and does not include separately funded low-income programs; and (3) CEE industry reports have not covered all 50 states and the District of Columbia, though it has been working toward a more complete data set.

Scoring

For this section of the report, we score states on reported annual energy efficiency electricity program spending in 2007. *Readers should note the obvious limitation in using 2007-year data in that is does not capture recent spending increases in 2008 and 2009.* We provide 2007-year program data, however, because it is the most recent available on *actual spending* (rather than budgets) from the EIA and because not all states are yet able to provide 2008-year spending figures.

The data presented in this section, depending upon the state, may include data from investor-owned utilities (IOUs), municipal utilities, and cooperative utilities; other public power companies or authorities; and utility ratepayer-funded public benefits programs. (Note: when states have separately funded low-income programs, those amounts are not included in this dataset.[6]) The data is for actual spending, which in many cases may differ from budgeted amounts for energy efficiency programs.

Readers should note that many states have significantly increased spending in 2008 and 2009 and have plans to dramatically escalate program efforts in the near future, such as Illinois, Michigan, North Carolina, Ohio, and Pennsylvania. While the spending and savings data do not capture these plans, the energy savings targets category does capture these state efficiency goals and the resulting commitments that will follow.

States are scored on a scale of 0 to 5 based on levels of energy efficiency spending as a percent of utility revenues. For every 0.25% less than 2.0% spending of revenues, a state's score decreases by 0.5 points. For the two lowest scoring bins, the distribution of points changes slightly to account for states with very minimal spending. Table 3 lists the scoring bins for each level of spending and Table 4 shows state-by-state results and scores for this category.

[4] See http://www.cee1.org/ee-pe/2008/

[5] Including load management programs, CEE's estimate of 2007 and 2008 budgets are $3.1 billion and $3.7 billion, respectively.

[6] We did not collect data on weatherization program funding, which is almost entirely federally funded — the federal Weatherization Assistance Program (WAP) gives money to states on a formula basis. Some states commit funds to leverage federal money; however, the scope of this project did not permit us to track these data.

Table 3. Scoring Methodology for Electricity Efficiency Program Spending

Percent Revenues Spending Range	Score
2.0% or greater	**5**
1.75% - 1.99%	**4.5**
1.50% - 1.74%	**4**
1.25% - 1.49%	**3.5**
1.0% - 1.24%	**3**
0.75% - 0.99%	**2.5**
0.50% - 0.74%	**2**
0.25% - 0.49%	**1.5**
0.13% - 0.24%	**1**
0.05% - 0.12%	**0.5**
Less than 0.05%	**0**

Table 4. 2007 Electricity Efficiency Program Spending by State (Total, Percent of Revenues, and Score)

State	2007 Total Spending* ('$1000)	Spending as Percent Revenues	Ranking	Score
Vermont	$23,690	3.4%	1	5
Washington	$126,678	2.6%	2	5
California	$755,279	2.2%	3	5
Oregon	$69,107	2.1%	4	5
Connecticut	$95,716	2.0%	5	5
Rhode Island	$17,936	1.9%	6	4.5
Minnesota	$91,239	1.7%	7	4
New York	$241,543	1.6%	8	4
Iowa	$56,493	1.4%	9	3.5
Massachusetts	$120,157	1.4%	10	3.5
New Hampshire	$18,676	1.3%	11	3.5
Idaho	$16,641	1.2%	12	3
Wisconsin	$80,580	1.2%	13	3
New Jersey	$95,914	1.1%	14	3
Maine	$16,881	1.0%	15	3
Texas	$79,500	0.9%	16	2.5
Nevada	$28,270	0.8%	17	2.5
Utah	$13,951	0.8%	18	2.5
Hawaii	$16,556	0.7%	19	2
South Dakota	$2,350	0.7%	20	2
Montana	$6,659	0.5%	21	2
Arizona	$31,900	0.5%	22	2
Kentucky	$17,874	0.4%	23	1.5
Florida	$92,564	0.4%	24	1.5
Tennessee	$9,968	0.4%	25	1.5
Colorado	$15,288	0.4%	26	1.5
Ohio	$28,757	0.2%	27	1
North Dakota	$668	0.2%	28	1
South Carolina	$8,927	0.2%	29	1

State	2007 Total Spending* ('$1000)	Spending as Percent Revenues	Ranking	Score
Kansas	$6,783	0.2%	30	1
New Mexico	$2,957	0.2%	31	1
North Carolina	$6,775	0.06%	32	0.5
Maryland	$2,523	0.06%	33	0.5
Indiana	$4,035	0.05%	34	0.5
Nebraska	$948	0.05%	35	0.5
Georgia	$4,819	0.0%	36	0
Alaska	$298	0.0%	37	0
Alabama	$2,287	0.0%	38	0
Arkansas	$1,565	0.0%	39	0
Pennsylvania	$4,069	0.0%	40	0
Missouri	$1,318	0.0%	41	0
Delaware	$208	0.0%	42	0
Mississippi	$307	0.0%	43	0
Illinois	$829	0.0%	44	0
Oklahoma	$173	0.0%	45	0
Virginia	$1	0.0%	46	0
Wyoming	$0	0.0%	47	0
Louisiana	$0	0.0%	47	0
District of Columbia	$0	0.0%	47	0
Michigan	$0	0.0%	47	0
West Virginia	$0	0.0%	47	0
U.S. Total	$2,219,658	0.8%	NA	NA

*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 separately funded low-income programs, load management programs, or energy efficiency research and development.

Annual Savings in 2007 from Electricity Efficiency Programs

For this category we report annual incremental savings (new energy savings achieved from measures implemented in the reporting year) from electricity energy efficiency programs,[7] as they were reported to ACEEE in a national survey of state-by-state efficiency programs and from utility data reported to the EIA on utility DSM programs.[8] The savings data is for 2007 and is reported as a percent of utility electricity sales in that year. Readers should 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 resulting savings levels.

States are scored on a scale of 0 to 5 based on levels of energy savings as a percent of utility electricity sales. States that achieved savings of at least 1% as a percent of electricity sales earn 5 points and score assignments are then distributed evenly for less than 1%, dropping 0.5 points for every 0.12% of savings. For the lowest scoring bin, the distribution of points changes slightly to account for states with very minimal savings. Table 5 lists the scoring bins for each level of savings and Table 4 shows state-by-state results and scores for this category.

[7] We do not report natural gas savings data due to the difficulty of obtaining data and the uncertain nature of the data that is available.
[8] Savings data reported to EIA should be reported as net savings, though it is too difficult to tell whether states in fact report net or gross savings.

Table 5. Scoring Methodology for Utility and Public Benefits Electricity Savings

Percent Savings Range	Score
1.0% or greater	**5**
0.88% - 0.99%	**4.5**
0.76% - 0.87%	**4**
0.64% - 0.75%	**3.5**
0.52% - 0.63%	**3**
0.40% - 0.51%	**2.5**
0.28% - 0.39%	**2**
0.16% - 0.27%	**1.5**
0.10% - 0.15%	**1**
0.05% - 0.09%	**0.5**
Less than 0.05%	**0**

Table 6. 2007 Incremental Electricity Savings by State: Total, Percent of Electricity Sales, and Score

State	2007 Total Incremental Elec. Savings (MWh)	Savings as Percent of Electricity Sales	Ranking	Score
Vermont	105,203	1.8%	1	5
California	3,393,016	1.3%	2	5
Hawaii	124,830	1.2%	3	5
Connecticut	371,899	1.1%	4	5
Maine	107,734	0.91%	5	4.5
Oregon	437,494	0.90%	6	4.5
Massachusetts	489,622	0.86%	7	4
Rhode Island	64,995	0.81%	8	4
Washington	635,062	0.74%	9	3.5
Iowa	322,177	0.71%	10	3.5
New Hampshire	78,537	0.70%	11	3.5
Minnesota	463,543	0.68%	12	3.5
Wisconsin	467,725	0.66%	13	3.5
Nevada	233,212	0.65%	14	3.5
Utah	139,000	0.50%	15	2.5
Idaho	103,000	0.43%	16	2.5
Arizona	312,736	0.41%	17	2.5
New York	540,612	0.36%	18	2
New Jersey	242,270	0.30%	19	2
Colorado	146,572	0.29%	20	2
Montana	43,329	0.28%	21	2
Florida	348,208	0.15%	22	1
Texas	457,808	0.13%	23	1
Kansas	34,726	0.09%	24	0.5
Tennessee	63,547	0.06%	25	0.5
New Mexico	10,241	0.05%	26	0.5
Nebraska	6,902	0.02%	27	0
Alaska	1,419	0.02%	28	0
Kentucky	17,874	0.02%	29	0

State	2007 Total Incremental Elec. Savings (MWh)	Savings as Percent of Electricity Sales	Ranking	Score
Indiana	20,653	0.02%	30	0
Ohio	29,789	0.02%	31	0
South Carolina	13,416	0.02%	32	0
Arkansas	6,154	0.01%	33	0
Alabama	7,681	0.01%	34	0
Mississippi	3,539	0.01%	35	0
Missouri	4,516	0.01%	36	0
Pennsylvania	3,800	0.00%	37	0
North Dakota	266	0.00%	38	0
Georgia	2,977	0.00%	39	0
North Carolina	1,391	0.00%	40	0
South Dakota	87	0.00%	41	0
Oklahoma	203	0.00%	42	0
Maryland	166	0.00%	43	0
Illinois	314	0.00%	44	0
Virginia	83	0.00%	45	0
Wyoming	0	0.00%	46	0
Delaware	0	0.00%	46	0
Louisiana	0	0.00%	46	0
Michigan	0	0.00%	46	0
West Virginia	0	0.00%	46	0
District of Columbia	0	0.00%	46	0
U.S. Total	9,858,328	0.26%		

Spending on Natural Gas Efficiency Programs

In addition to efficiency programs targeting electricity end-use consumption, we also score states on natural gas efficiency program spending by assigning up to a maximum of 3 points based on 2007 spending data. An important caveat to note is that there is no national clearinghouse for natural gas program data and therefore we must rely on state-by-state reviews and other data (CEE 2007, 2008). A number of states do not report data for natural gas efficiency program spending and we therefore assign them a zero for this category. States not listed in Table 8 were among those states that did not report spending data. In order to directly compare state spending data, we normalize spending to population by state. Table 7 shows scoring bins for natural gas program spending and Table 8 shows state scoring results. For 2007, we estimate total spending on natural gas programs of nearly $300 million, and combined with electric program spending of about $2.2 billion, we estimate national spending of about $2.5 billion on efficiency programs in 2007.

Table 7. Scoring Methodology for Natural Gas Utility and Public Benefits Spending

Spending Range ($ per capita)	Score
$3.50 or greater	3
$2.50 — 3.49	2.5
$2.00 — 2.49	2
$1.00 — 1.99	1.5
$0.50 — 0.99	1
$0.10 - $0.49	0.5
$0	0

Table 8. 2007 Natural Gas Program Spending by State

State	2007 Total Spending (Million $)	Spending Relative to State Population ($ per capita)	Ranking	Score
Iowa	$28.4	$9.5	1	3
New Jersey	$37.8	$4.4	2	3
Massachusetts	$25.6	$4.0	3	3
Utah	$9.5	$3.6	4	3
California	$118.1	$3.2	5	2.5
Minnesota	$15.6	$3.0	6	2.5
Oregon	$10.7	$2.9	7	2.5
Vermont	$1.5	$2.4	8	2
Rhode Island	$1.9	$1.8	9	1.5
Wisconsin	$10.0	$1.8	10	1.5
Montana	$1.6	$1.7	11	1.5
New Hampshire	$1.9	$1.4	12	1.5
Washington	$8.2	$1.3	13	1.5
South Dakota	$0.9	$1.1	14	1.5
New Mexico	$1.7	$0.9	15	1
Florida	$14.2	$0.8	16	1
Connecticut	$2.6	$0.7	17	1
Indiana	$4.5	$0.7	18	1
Idaho	$1.0	$0.7	19	1
New York	$10.6	$0.5	20	1
Colorado	$2.6	$0.5	21	1
Kentucky	$1.5	$0.4	22	0.5
Ohio	$2.9	$0.3	23	0.5
Nevada	$0.4	$0.2	24	0.5
Maine	$0.1	$0.1	25	0.5
North Carolina	$0.7	$0.1	26	0.5
Missouri	$0.3	$0.1	27	0.5
Total	$315	NA	NA	NA

Note: States not listed here do not report natural gas efficiency spending data.

Energy Savings Targets (Energy Efficiency Resource Standards)

An Energy Efficiency Resource Standard (EERS) is a quantitative, long-term energy savings target for utilities. Under direction from this policy, utilities must procure a percentage of their future electricity and natural gas needs using energy efficiency measures, typically equal to a specific percentage of their load or projected load growth. Energy savings are typically achieved through customer, end-use efficiency programs run by utilities or third-party program operators, sometimes with the flexibility to achieve the target through a market-based trading system. In late 2008 and early 2009, Pennsylvania, Michigan, Delaware, and Iowa adopted an EERS, bringing the total to twenty states that have an EERS or similar policy (see Table 10).

A similar policy mechanism to encourage renewable energy production, called a Renewable Portfolio Standard (RPS), has been adopted as a mandatory target in 28 states, plus Washington, D.C. (UCS 2009). Several states that have already implemented an RPS subsequently expanded it to include

energy efficiency as an eligible resource to meet the targets, thus establishing an EERS. Examples of combined EERS–RPS policies are found in Nevada, Connecticut, and North Carolina.

A number of states have taken an approach similar to an EERS by establishing energy efficiency as the first priority resource in utility energy planning. Putting efficiency first in this "loading order" ensures states utilize cost-effective energy efficiency before other generation sources. States with this mandatory energy efficiency priority loading order include: California, Connecticut, Delaware, Maine, Massachusetts, Rhode Island, Vermont, and Washington.

Scoring

A state can earn up to 4 points in this category based on a number of factors. The major considerations are the levels of aggressiveness of the efficiency targets and whether the targets are binding (see Table 9 for general scoring bins) because these metrics vary significantly among the states. Most state energy savings targets are set either as a cumulative percent target or as an annual percent target that ramps up. To directly compare the targets, we normalize savings targets to an estimated average annual savings target. Scores are then adjusted upward by 1 point if both electricity and natural gas are covered under the targets (e.g., Minnesota). Scores are adjusted downward by 1 point if the policy is not completely binding, meaning it either has an "exit ramp" for utilities to avoid meeting the target or a "cost cap" that limits a spending amount rather than a specific savings target (e.g., Illinois). Also, because the purpose of an EERS is to set a long-term vision of energy efficiency in the state, targets must be established for multiple years.

States that have mandated energy efficiency as their first priority resource in utility resource planning, as noted above, are also awarded a point if the state does not also have an EERS in place. Rhode Island and Maine receive one point each for adopting this policy.

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, agreements among major stakeholders on targets, or pending legislation (passed by both houses of the state legislature) that sets specific, binding savings targets. Many states allow utilities to form targets in the integrated resource planning process, and some states create goals for energy efficiency program administrators. While these are important steps, they do not qualify as an EERS because they are generally not binding or long-term goals. States that fall in this category include: Arkansas, Arizona, Florida, Oklahoma, Maine, New Hampshire, New Jersey, Oregon, Virginia, and Utah. States with a pending EERS policy that have not yet established a clear path toward implementation include Utah, Virginia, and New Jersey.

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

Table 10. State Scores for Energy Savings Targets

State	Description	Approx. Annual Savings Target	Year of Implementation	Binding Target or "Exit Ramp"	Score
Delaware	On July 29, 2009, Governor Markell signed SB 106, which establishes Energy Efficiency Resource Standards (EERS) and sets goals for consumption and peak demand for electricity and natural gas utilities. The goals are 15% electricity consumption and peak demand savings and 10% natural gas consumption savings by 2015.	2.5%	2009	Binding	**4**
Iowa	In 2008, investor-owned utilities were required to submit plans to achieve a 1.5% annual electricity and natural gas savings goal. In March 2009, the Iowa Utilities Board (IUB) approved MidAmerican Energy Company's Energy Efficiency Plan which calls for 1.5% electricity savings by 2010 and 0.85% natural gas savings by 2013. Although not required by legislation, once the board approves the multi-year utility plan, the goals are binding.	1.5%	2008	Binding	**4**
Massachusetts	The Green Communities Act establishes the requirement that electric and gas utilities acquire all cost-effective energy efficiency that costs less than new energy supply as the first priority resource. A recent agreement of major stakeholders adopted a plan that sets an energy savings target of 2.4 percent of electricity sales in 2012.	2.4%	2008	Binding	**4**
Minnesota	In December 2006, Governor Pawlenty announced his Next Generation Energy Initiative, calling for 1.5% annual energy savings of both electric and natural gas sales, at least 1% of which must come from utility energy efficiency programs. This plan was enacted in legislation in 2007 and requires utilities to meet the annual targets by 2010.	1-1.5%	2010	Binding	**4**
New York	In June 2008, the New York State Public Service Commission approved the Energy Efficiency Portfolio Standard (EEPS), which sets a goal to reduce electricity usage 15% by 2015. The Commission currently has an open proceeding working with utilities and NYSERDA to develop and improve programs. NY PSC also approved natural gas efficiency targets. The targets aim to save 4.34 Bcf annually through the end of 2011 and 3.45 Bcf annually beyond 2011. The gas targets aim for 1.3% annual savings and are not binding.	1.9%	2011	Binding*	**4**
Vermont	Efficiency Vermont (EV), an independent "efficiency utility" that delivers efficiency programs for the state, is contractually required to achieve energy and demand goals. EV cumulatively met over 5% of Vermont's electricity requirements by the end of 2006. In 2009-2011, EV is planning to achieve an additional 360 million kWh of savings and 105 MW of peak demand reduction, or about 6% of 2008 sales.	2.0%	2000	Binding	**4**

State	Description	Approx. Annual Savings Target	Year of Implementation	Binding Target or "Exit Ramp"	Score
Hawaii	The state's new EEPS sets a goal of 4,300 GWh reduction by 2030, approximately 40% of 2007 electricity sales. The new law allows the PUC to change the 2030 goal, but also calls for penalties for non-compliance. Also, under the state's RPS requirements, energy efficiency qualifies as an eligible resource. Utilities must meet 40% of electricity sales by 2030 with eligible resources; however, efficiency minimums or maximums are not specified.	1%	2004	Binding	**3**
Connecticut	In June 2005, the Connecticut legislature modified its Renewable Portfolio Standard to include efficiency. Starting in 2007, the state's utilities must procure a minimum 1% of electricity sales from "Class III" resources such as energy efficiency and CHP, with an additional 1% per year required in 2008, 2009, & 2010. Higher goals are now pending before the PUC.	1%	2007	Binding	**3**
Colorado	In April 2007, the Colorado legislature adopted a bill that called on the Colorado Public Utilities Commission (CPUC) to establish energy savings goals and provide financial incentives for utilities. The CPUC established energy savings goals of about 11.5% by 2020 for it's investor-owned utilities' DSM programs, or about 1% annually. The CPUC has also set varying natural gas savings targets for its utilities.	1%	2009	Binding	**3**
Maryland	In 2008, Governor O'Malley introduced legislation that requires the state to reduce per-capita electricity consumption 15% by 2015, relative to 2007 consumption. Utilities must meet 2/3^{rds} of the goal and the state must administer programs to reach 1/3rd of the goal.	1.5-1.8%	2008	Binding (utility portion only)*	**3**
Pennsylvania	In 2008, Governor Rendell signed Act 129, requiring that each electric distribution company with at least 100,000 customers must reduce energy consumption by a minimum 1% by May 31, 2011, increasing to 3% by May 31, 2013. Peak demand must be reduced by 4.5% by May 31, 2013.	1%	2009	Binding	**3**
Illinois	In July 2007, the Illinois legislature set energy efficiency and demand response program requirements for utilities. With help from the Illinois Department of Commerce and Economic Opportunity (IDCEO), utilities are to meet annual savings goals of 0.2% of energy delivered in 2008, 0.4% in 2009, and so on, rising to 2.0% annually for 2015 and subsequent years. The state passed natural gas savings targets in 2009 that begins with 0.2% savings by May 31, 2011, ramping up to 1.5% in 2019.	1.2% (avg. through 2020)	2008	Cost Cap	**3**
California	California's 2010-2012 Energy Efficiency Plan sets targets for its four major electric and gas utilities. The plan calls for 7,000 GWh to be saved over the three year period, or 0.9% of California's 2007 sales annually.	0.9%	2004	Binding	**3**

State	Description	Approx. Annual Savings Target	Year of Implementation	Binding Target or "Exit Ramp"	Score
Nevada	The state's RPS was expanded in 2009 to 25% of electricity sales by 2025. The law allows energy efficiency to meet up to 25% of the total portfolio standard.	Up to 0.6% per year; Achieved 0.9% in 2007	2007	Binding	**2**
New Mexico	In February 2008, Governor Richardson signed into law HB 305, which directs electric and gas utilities to acquire all cost-effective and achievable energy efficiency resources. Electric utilities must achieve 5% energy savings from 2005 electricity sales by 2014, and 10% by 2020. The Public Regulation Commission (PRC) can set alternative energy efficiency requirements if the electric utility demonstrates it cannot meet the minimum requirements.	0.7% (avg. through 2020)	2008	Exit Ramp	**2**
Ohio	In 2008, legislation was passed that requires a gradual ramp-up to a 22% reduction in electricity use by 2025. Starting in 2009, electric distribution utilities must achieve 0.3% savings, which ramps up to 1% per year by 2014, then jumps to 2% per year in 2019 through 2025	1.3% (avg. through 2025)	2009	Exit Ramp	**2**
Michigan	Electric utilities must achieve 0.3% savings for 2009, ramping up to 1.0% in 2012 and each year thereafter. Natural gas utilities must achieve 0.1%, ramping up to 0.75% in 2012 and each year thereafter. There is no specific penalty for not achieving the savings amounts, but incentives are allowed for exceeding the targets.	0.3%; ramp-up to 1% in 2012	2008	Binding	**2**
Washington	A 2006 ballot initiative requires utilities to acquire all cost-effective energy efficiency. The Northwest Power and Conservation Plan (NWPPC) is expected to be the basis for setting efficiency targets. The most recent NWPPC plan identifies 2,700 average MW of conservation savings as being cost-effective and achievable by 2025, amounting to 10.6% of projected needs in that year if additional conservation is not pursued. By 2010, each qualifying utility shall identify its achievable cost-effective energy efficiency potential through 2019. Overall, the state is expected to achieve savings of 1% per year.	Approx. 1%	2010	Binding	**2**
North Carolina	In August 2007, the North Carolina legislature enacted a law requiring public electric utilities in the state to obtain renewable energy power and energy efficiency savings of 3% of prior-year electricity sales in 2012, 6% in 2015, 10% in 2018, and 12.5% in 2021 and thereafter. Energy efficiency is capped at 25% of the 2012-2018 targets, and at 40% of the 2021 target.	Up to 0.75% in 2012; no specific EE goal	2012	Cost Cap	**1**

State	Description	Approx. Annual Savings Target	Year of Implementation	Binding Target or "Exit Ramp"	Score
Texas	Texas became the first state to establish an EERS in 1999, requiring electric utilities to offset 10% of load growth through end-use energy efficiency. After several years of meeting this goal at low costs, in 2007 the legislature doubled the standard to 15% of load growth by 2009, and 20% of load growth by 2010, and directed that higher targets be investigated.	0.3%	1999, 2009 update	Binding	**1**
Rhode Island*	Rhode Island has a legislative requirement enacted for electric and gas utilities to acquire all cost-effective energy efficiency that costs less than new energy supply as the first priority resource, placing it first in a utility's resource "loading order" and greatly increasing the role of energy efficiency in utility long-term planning.	None	2006	Binding	**1**
Maine*	Maine has a legislative requirement that the commission shall prioritize energy efficiency before any other traditional resource in selecting capacity resources.	None	2007	Binding	**1**

* These states have not established an EERS; though have mandated energy efficiency as a first priority resource in utility resource planning.

Utility Financial Incentives and Removal of Disincentives (Decoupling)

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 guaranteeing utilities' rates-of-return while removing the disincentive to promote energy efficiency among utilities' customers. There are two key regulatory mechanisms that address the removal of disincentives and implementation of positive incentives for reducing customer energy use through improved levels of energy efficiency. These mechanisms go beyond ensuring recovery of the direct costs associated with energy efficiency programs, which 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 two key mechanisms are fixed cost recovery (decoupling and other lost revenue adjustment mechanisms) and performance incentives. Decoupling refers to the disassociation of a utility's revenues from sales, which makes the utility indifferent to maximizing sales. Although this does not necessarily make the utility more likely to promote efficiency programs, it removes the disincentive for them to do so. Performance incentives are financial incentives that reward utilities (and in some cases, non-utility organizations) for reaching or exceeding specified program 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.

It is important to note that these mechanisms stand to receive increased attention in coming years, resulting from the passage of the *American Recovery and Reinvestment Act of 2009* (ARRA), which was passed in February 2009.[9] Section 410 (a)(1) of this Act allows governors to receive additional State energy grants if they provide assurance that the applicable State regulatory authority has, in part, sought to implement a policy that aligns financial incentives for electric and natural gas utilities with helping their customers use energy more efficiently.

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 its electric and natural gas utilities (see Table 11). For those states receiving less than the full 3 points, half points were added for mechanisms that are authorized but not yet implemented and also for lost revenue adjustment mechanisms.[10] Information about individual state decoupling policies and financial incentive mechanisms is available on ACEEE's State Energy Efficiency Policy Database.

[9] Public Law 111-5. http://www.gpo.gov/fdsys/pkg/PLAW-111publ5/content-detail.html

[10] A Lost Revenue Adjustment Mechanism (LRAM) is one way to reimburse the utility to the extent energy sales are reduced but it does not compensate the consumer if sales increase so the incentive for the utility to increase sales is still present.

Table 11. States Scoring Methodology for Utility Financial Incentives

Criteria	Points
The legislature has approved or recommended decoupling and/or performance incentives but the use of a given mechanism has not yet been implemented. OR Lost Revenue Recovery is in place for at least one electric and/or natural gas utility.	0.5
Decoupling or performance incentives established for at least one electric or natural gas utility or non-utility organization (performance incentives only possibly apply to non-utility organizations that administer programs)	1
Both decoupling and performance incentives established for electric or natural gas utilities (or non-utility organizations) OR Decoupling or performance incentives established for both electric and natural gas utilities (or non-utility organizations).	2
Decoupling and performance incentives established for both electric and natural gas utilities (or non-utility organizations).	3

Table 12. Utility Financial Incentives

	Decoupling (or related mechanism)		Performance Incentives		
State	Electricity	Natural Gas	Electricity	Natural Gas	Score
California	Yes	Yes	Yes	Yes	3
Connecticut	Yes	Yes	Yes	Yes	3
New York	Yes	Yes	Yes	Yes	3
Vermont	Yes	Yes	Yes	Yes	3
Wisconsin	Yes	Yes	Yes	Yes	3
North Carolina	Yes^	Yes	Yes	No	2.5
Minnesota	Yes*	Yes*	Yes	Yes	2.5
Kentucky	Yes^	Yes^	Yes	Yes	2.5
Nevada	Yes^	Yes	Yes	Yes	2.5
Colorado	No	Yes	Yes	Yes	2.5
Massachusetts	Yes*	Yes*	Yes	Yes	2.5
Arizona	No	Yes	Yes	No	2
Oregon	Yes	Yes	No	No	2
Maryland	Yes	Yes	No	No	2
Idaho	Yes	No	Yes	No	2
Washington	No	Yes	Yes	No	2
New Hampshire	No	No	Yes	Yes	2
Rhode Island	No	No	Yes	Yes	2
Indiana	No	Yes~	Yes*	Yes*	2
Ohio	Yes^*	Yes^*	Yes	No	1.5
Hawaii	Yes*	Yes*	Yes	No	1.5
New Jersey	No	Yes~	No	No	1.5
Utah	Yes*	Yes	Yes*	Yes*	1.5

	Decoupling (or related mechanism)		Performance Incentives		
State	Electricity	Natural Gas	Electricity	Natural Gas	Score
Virginia	No	Yes	Yes*	No	1.5
South Carolina	Yes^	No	Yes	No	1.5
District of Columbia	Yes	No	Yes*	Yes*	1.5
Georgia	Yes^	No	Yes	No	1.5
Oklahoma	Yes^	No	Yes	No	1.5
Arkansas	No	Yes	No	No	1
Illinois	No	Yes	No	No	1
Wyoming	No	Yes	No	No	1
Texas	No	No	Yes	No	1
South Dakota	No	No	Yes	No	1
Montana	Yes^	Yes^	Yes*	Yes*	1
Missouri	No	Yes^	Yes*	No	1
Michigan	Yes*	Yes*	Yes*	Yes*	0.5
Kansas	No	No	Yes*	Yes*	0.5
Florida	No	No	Yes*	Yes*	0.5
New Mexico	Yes*	Yes*	Yes*	Yes*	0.5
Delaware	Yes*	Yes*	No	No	0.5
Maine	Yes*	No	Yes*	No	0.5
Alabama	No	No	No	No	0
Alaska	No	No	No	No	0
Iowa	No	No	No	No	0
Louisiana	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
Tennessee	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 a lost revenue adjustment mechanism are utilized.
Sources: Kushler, York, and Witte (2006); RAP (2008); AGA (2008); NRDC (2009a); IEE (2009a, 2009b); Lesh (2009)

Figure 1. Leading States: Utility Sector and Public Benefit Programs and Policies

Leading states for Chapter 1 have made major strides in incorporating energy efficiency into their utility sector and/or public benefits programs, including robust spending on efficiency for both electricity and natural gas, high levels of energy savings, strong energy savings targets, and supporting policies to remove disincentives to invest in efficiency and to reward utilities for meeting goals.

California. California's utility-sector energy efficiency programs date back to the 1970s and have significantly expanded over the past three decades. The state's investor-owned utilities and publicly-owned utilities administer energy efficiency programs. In 2007, electric utilities spent in total about $755 million on efficiency programs, equivalent to about 2.2% of utility revenues. Electricity savings from these programs totaled about 1.3% of the state's electric needs in 2007. Also, decoupling has been in place for many years in California and is an integral policy for California's "big, bold" energy efficiency initiative. In September 2009, the California Public Utilities Commission (CPUC) approved a $3.1 billion budget for energy efficiency programs managed by the state's IOUs for the years 2010–2012, a 42% increase compared to the previous three-year program cycle.

Connecticut. Connecticut has operated utility-administered energy efficiency programs for many years. In 2005, the state legislature passed the "Energy Independence Act," requiring 1% of its electricity demand to be met from energy efficiency by 2007, rising 1% per year to 4% in 2010. Higher goals are now pending before the PUC. In 2007, Connecticut utilities spent about $96 million (equivalent to 2% of utility revenues) on efficiency programs and met 1.1% of the state's electric needs from efficiency. The state has performance incentives in place to encourage and reward utilities for successfully reaching established performance targets. In 2007, the Connecticut legislature further increased efficiency efforts in the state, requiring the state's utilities to procure all cost-effective energy efficiency as their first-priority resource. In addition, Connecticut has performance incentives in place to encourage and reward electric and natural gas utilities for successfully reaching performance targets.

Massachusetts. Massachusetts is a leading state with a long, successful record of energy efficiency programs, which are managed and implemented by electric and natural gas distributors. In 2007, electric utilities spent about $120 million on efficiency programs in the state, which is equivalent to about 1.4% of utility revenues, and reported savings equivalent to about 0.9% of the state's electricity needs. The Green Communities Act of 2008 established a new process for the design and approval of efficiency programs, made cost-effective energy efficiency the "first-priority" resource, and created the Energy Efficiency Advisory Council (EEAC) to work with utilities to establish statewide efficiency plans for three-year cycles. In 2009, Massachusetts natural gas and electric utilities submitted their Joint Statewide Three-Year Energy Efficiency Plans, which propose to double annual savings in both electric and natural gas use by 2012 compared to 2009 levels. The proposed plans, which have been approved by the EEAC and are being presented to the Department of Public Utilities for approval in fall 2009 (a final decision is expected in January 2010), set an electricity savings target of 2.4% of sales in 2012. In addition, shareholder incentives are in place for utility efficiency programs that meet established program goals and the state has announced a regulatory policy in favor of decoupling; electric and natural gas utilities must include a decoupling proposal in their next rate case.

Vermont. Vermont continues to be a leader in Utility and Public Benefits Programs and Policies. Efficiency Vermont, which began operations in 2000, is the state's provider of electric energy efficiency services, funded by an "energy efficiency charge" or "EEC" that is included in electric rates on customers' monthly electric bills. In 2007, state spending on electric efficiency programs was about $23.7 million, which is equivalent to 3.4% of utility revenues, more than any other state. State efficiency programs achieved about 1.8% of the state's electricity needs in 2007 and in 2008 achieved about 2.5%. State gas efficiency programs also lead the nation, with relative spending levels the highest of any state. Vermont also sets aggressive energy efficiency targets and has established utility performance incentives for the state's "energy efficiency utility" (Efficiency Vermont) to encourage targets to be met.

CHAPTER 2: TRANSPORTATION POLICIES

Author: Shruti Vaidyanathan

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. At the federal level, significant progress has been made this year to reduce transportation energy consumption. The U.S. Environmental Protection Agency and the U.S. Department of Transportation (DOT) recently proposed combined standards for fuel economy and greenhouse gas emissions from light-duty vehicles. These standards will require an average of 250 grams of carbon dioxide (CO_2) per mile and a fleet fuel efficiency of about 34 mpg by 2016, nearly reaching the level mandated for 2020 as part of the Energy Independence and Security Act of 2007. The EPA's proposed greenhouse gas emissions standards for vehicles are designed to match California's vehicle greenhouse gas (GHG) emissions requirements in stringency in 2016.

Additionally, the overall efficiency of the U.S. transportation system is receiving considerable attention. Several federal bills introduced this year aim to slow growth in vehicle miles traveled (VMT) and GHG emissions. The American Clean Energy and Security Act (ACES, H.R. 2454), which sets comprehensive guidelines for GHG regulation, directs EPA and DOT to set transportation-specific GHG reduction goals. The Act also calls on states and metropolitan areas to incorporate GHG targets into the transportation planning process. The 2009 Clean Low-Emissions Affordable New Transportation Equity Act (CLEAN TEA, H.R. 1329, S.575) requires, if and when a carbon cap-and-trade program is adopted, that 10% of allowances be auctioned to fund transportation sector programs and projects to reduce emissions. CLEAN TEA also directs states, and regional and local entities to create GHG reduction plans and establish transportation-specific GHG goals, but does not include requirements for national transportation related targets.

The 2009 Federal Surface Transportation Policy and Planning Act, introduced in the Senate, calls for an annual reduction in VMT per capita, a 40% reduction in transportation-related GHGs by 2030, an increase in the use of public transit, and a 10% reduction in the truck share of freight movement. This bill is a precursor to the reauthorization of the massive federal transportation spending bill, which is due in the fall of 2009 but could experience up to 18 months' delay. A House proposal for the reauthorization has already been introduced, however, and it mirrors the climate bill's requirements for transportation GHG targets. The bill allocates $100 billion over 6 years for transit-related projects, while also creating an Office of Livability within the Federal Highway Administration to advance environmentally sustainable transportation and communities.

Notwithstanding this flurry of activity, certain states have gone above and beyond the progress made at the federal level to implement a variety of policies to reduce transportation energy usage. This year states are scored out of a total possible eight points in this category. Because policies to promote compact development and reduce the need to drive are among the most effective ways to reduce transportation energy use for state and local governments, states that have adopted such policies can score up to 4 points in the scoring for this chapter. States that have adopted the California clean car standard earned 2 points. States offering consumer incentives for the purchase of high-efficiency vehicles earned one point, as did those with relatively high investment in transit ($50 per capita or more). See Table 13 for scores on state transportation policies.

Table 13. State Scoring on Transportation Policies

States	Vehicle GHG emissions Standards[a]	Policies to Reduce Vehicle Miles Traveled[b]	State Transit Funding[c]	High-Efficiency Vehicle Consumer Incentives[d]	Score
California	••	••	•	•	6
Washington	••	•••		•	6
Connecticut	••	••	•		5
Maryland	••	••	•		5
New Jersey	••	••	•		5
New York	••	••	•		5
Oregon	••	••		•	5
Arizona	••	••			4
District of Columbia	••		•	•	4
Maine	••	••			4
Massachusetts	••	•	•		4
Pennsylvania	••	•	•		4
Rhode Island	••	••			4
Vermont	••	••			4
Delaware		••	•		3
Minnesota		•	•		2
New Mexico	••				2
Tennessee		••			2
Alaska			•		1
Colorado				•	1
Florida		•			1
Georgia		•			1
Hawaii		•			1
Louisiana				•	1
Oklahoma				•	1
South Carolina				•	1
Virginia		•			1
Wisconsin		•			1
Alabama					0
Arkansas					0
Idaho					0
Illinois					0
Indiana					0
Iowa					0
Kansas					0
Kentucky					0
Michigan					0

States	Vehicle GHG emissions Standards[a]	Policies to Reduce Vehicle Miles Traveled[b]	State Transit Funding[c]	High-Efficiency Vehicle Consumer Incentives[d]	Score
Mississippi					0
Missouri					0
Montana					0
Nebraska					0
Nevada					0
New Hampshire					0
North Carolina					0
North Dakota					0
Ohio					0
South Dakota					0
Texas					0
Utah					0
West Virginia					0
Wyoming					0

[a] Source: Clean Cars Campaign
[b] Source: rankings based on criteria in NRDC (2008), updated for 2009
[c] Source: AASHTO (2008). See Appendix A for a complete ranking of state transit funding.
[d] Source: EERE Alternative Fuel and Advanced Vehicles Data Center

Vehicle Greenhouse Gas Emissions Standards

Vehicles' greenhouse gas 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 are expected to be achieved largely, though not entirely, through improved vehicle efficiency, so these standards are in effect energy efficiency policies. Several technologies stand out as providing significant, cost-effective reductions in emissions. Among others, these include the optimization of valve operation, turbocharging, improved multi-speed transmissions, and improved air conditioning systems.

In order for tailpipe emission standards to go into effect in the 14 states listed in Table 14, the USEPA had to first approve a waiver of federal pre-emption for California's regulations.[11] In June 2009, the EPA granted the waiver, allowing California and other adopting states to proceed with the implementation of the stricter standards, starting in 2009. In September 2009, EPA and DOT jointly proposed rules for greenhouse gas emissions and fuel economy standards for vehicles that would harmonize the federal and state programs. The proposed standards would result in fleetwide averages of 250 grams CO_2 per mile and 34.1 miles per gallon for cars and light trucks in 2016.

[11] See CARB's fact sheet: www.arb.ca.gov/cc/factsheets/cc_newfs.pdf.

Table 14. States that Adopted California's GHG Vehicle Emission Standards

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

Source: Clean Cars Campaign (2009)

By adopting the California program, these states showed strong commitment to improving the energy and greenhouse gas performance of light-duty vehicles, which account for two-thirds of transportation sector energy use. California retains its ability to set vehicle standards, and other states retain their ability to choose between California and federal standards, after 2016, so state leadership in this area remains important to continued progress. Therefore, adopting states are awarded two points in the transportation energy efficiency scoring.

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 can 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. Electric vehicles and hybrids, by contrast, which incorporate technology that improves vehicle fuel efficiency, are included in our review of policies.[12] However, as there are currently no mass-market electric vehicles on the road today, we assign points only to those states with purchase incentives for hybrids or framed in terms of fuel economy. 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.

[12] 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.

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 are likely to 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.
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.
Louisiana	Louisiana offers a tax credit worth 20% of the incremental cost of a hybrid vehicle. The tax credit must not exceed the lesser of $1,500 or 2% of the total cost of the new vehicle. Electric vehicles also qualify for this credit.
Oklahoma	Prior to January 1st, 2015, a one-time tax credit is available to purchasers of light-duty electric or hybrid-electric vehicles for the lesser of $6,000 and 50% of the cost of the electric power train. Credits of up to $26,000 are available for heavy-duty hybrid vehicles, including hydraulic hybrids.
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.
South Carolina	A state income tax credit equivalent to 20% of the federal tax credit is available to purchasers of hybrid vehicles.
`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.

Source: DOE (2009)

State Transit Funding

In addition to federal funds for public transit, states also pull 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 $50 or more per capita on public transit in 2006 earned one point in the overall transportation Scorecard (see Appendix B). These are: Alaska, California, Connecticut, Delaware, the District of Columbia, Maryland, Massachusetts, Minnesota, New York, New Jersey, and Pennsylvania. The $50 threshold represents a breakpoint in state spending data and of course does not automatically translate into energy savings. It is used here simply as an indicator of a states' commitment to providing alternatives to driving that are less energy-intensive.

Policies to Reduce Vehicle Miles Traveled (VMT)

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 40% by 2030, substantially outpacing population growth in the country (EIA 2009). Reducing the rate of VMT growth requires the coordination of transportation and land use planning, which is typically under local or regional jurisdiction. This gives states a more important role than the federal government in slowing VMT growth.

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 statewide 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;
- Higher residential density;
- High quality transit service; and
- Activity centers where destinations are close together.

States can earn a maximum of 4 points for the adoption of policies to reduce vehicle miles traveled. States with explicit VMT or transportation GHG reduction targets are awarded 2 points. States with codified growth management acts score 1 point as do those with mechanisms in place to encourage coordinated land use and transportation development. Points were awarded to a wide range of efforts under the coordinated development category. Arizona earned a point for the 2007 creation of their Growth Cabinet, which works with municipalities to implement a smart growth-based development process and directs discretionary funding towards communities that undertake compact development policies. Similarly, Massachusetts was awarded a point for its Commonwealth Capital Program. The program prioritizes state funding for municipalities that demonstrate regional cooperation in land use and transportation planning and apply energy efficiency measures to enhance community development and reduce greenhouse gas emissions.

Figure 2. Leading States: Transportation Efficiency

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 California Air Resources Board to develop regional transportation-specific GHG reduction goals, in collaboration with the Metropolitan Planning Organizations. These goals must subsequently be reflected by regional transportation plans that create compact, sustainable development across the state and reduce VMT growth.

California also recently passed AB 118, a clean transportation program that includes funding for a hybrid vehicle rebate program targeted at medium- and heavy-duty vehicles. The goal is to reduce the high up-front costs associated with the purchase of high efficiency vehicles. Rebates are likely to range from $20,000 to $40,000 per vehicle depending on vehicle specification.

Washington: The state of Washington has long been a leader in transportation planning energy efficiency measures. Washington was one of the first states to implement a specific vehicle miles traveled reduction target. The state mandates an 18% decline in annual VMT per capita by 2020, a 30% reduction by 2035, and a 50% reduction by 2050. The state also has a comprehensive Growth Management Act that requires state and local governments to manage Washington's growth by preparing comprehensive plans, designating urban growth areas, and creating development regulations.

CHAPTER 3: BUILDING ENERGY CODES

Author: Max Neubauer

Building Codes and the American Recovery and Reinvestment Act

The appropriation of funding through the DOE's State Energy Program (SEP) has made 2009 an unprecedented year with regards to the adoption of building energy codes. Funding from SEP is allocated to states in two stages. The first half of the SEP funds become available at the time the initial grant is awarded and the DOE approves each state's State Plan. Access to the other half of the SEP ARRA funds is contingent upon states meeting certain requirements, one being the adoption of residential and commercial building energy codes that meet or exceed the most recent International Energy Conservation Code (IECC) and ANSI/ASHRAE/IESNA Standard 90.1-2007 and development of a plan to achieve 90% compliance of these codes within eight years.

This code requirement has caused about 30 states to begin legislative or administrative processes that have or will lead to the adoption of the required versions of IECC and ASHRAE as stipulated by ARRA over the course of the next several years. States have recognized an urgent need for investment and development, reflected by their willingness to tighten building energy codes in order to receive additional federal funding. These states accounted for around 60% of all new housing starts in the United States in 2008 and many of them, such as Maine, Illinois, and Delaware, have either no mandatory statewide codes or codes that are considerably old and outdated. And because residential construction has been trending away from smaller homes towards larger ones, the incorporation of more stringent building codes in these markets has the potential to generate tremendous energy savings (Census 2009).

Background

Buildings consume 73% of the electricity generated and 40% of total energy use in the United States, while accounting for 40% of the carbon dioxide emissions for which the U.S. is responsible (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 construction. Mandatory building energy codes are one way to target energy efficiency by requiring a minimum level of energy efficiency for 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 also includes prescriptive and performance commercial building provisions.

The most recent versions of the IECC and ASHRAE are the 2009 IECC and ASHRAE 90.1-2007. While several states have officially adopted the 2009 IECC and/or ASHRAE 90.1-2007, the codes do not become effective until late 2009 or beyond. Many 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, according to the DOE. Although the savings from commercial provisions have not been estimated, some in industry estimate a 4% improvement over the 2006 IECC commercial provisions (SWEEP 2009). ASHRAE publishes guides, available on its Web site, that target 30% energy savings as the first step towards achieving a net zero energy building.[13] Using ASHRAE 90.1-1999 as the baseline, the 30% guides are designed to facilitate the achievement of advanced levels of energy savings in a manner that is more accessible to designers.

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 Building Codes Assistance Project (BCAP), which maintains maps and state overviews of building energy codes, as well as the Department of Energy'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 the most stringent codes (see Table 16). We then averaged the two for an overall stringency score (see Table 17). In some cases, we adjusted state scores based on adoption of key standards that increase the stringency of a state's codes.

Because of the number of states that are in the process of updating their codes to meet the requirements mandated by ARRA, full credit was given for those states that have exhibited progress imminently leading to the adoption of the latest versions of the IECC and ASHRAE

[13] Please visit http://www.ashrae.org/technology/page/938 for more information.

within the next year. We have not limited qualification based on codes that have already become effective, as was the case in our 2008 Scorecard. However, the majority of states that have begun the process of updating their codes to meet the ARRA requirement have not yet officially adopted the codes nor have they made enough progress to show that adoption of the latest IECC and ASHRAE codes is definitive and will become effective soon. Nonetheless, it is important to note that the processes have begun and are moving along, which we denote by marking these states with an asterisk. Once their efforts have culminated in the adoption of the new codes, they will be reflected in next year's iteration of our Scorecard.

In addition, we also score states' level of efforts to comply with their 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. States do not have enough funding to employ the number of code officials required to create samples that are large enough to properly represent the level of compliance within a state. In order to collect this information, we distributed a survey to 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 are given 2 points for making substantial efforts 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.

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

Score	Residential Building Code	Commercial Building Code
5	Meets or exceeds 2009 IECC or equivalent	Meets or exceeds 2009 IECC or ASHRAE 90.1-2007 or equivalent
4	Exceeds 2006 IECC or equivalent	Exceeds 2006 IECC or ASHRAE 90.1-2004, or equivalent
3	Meets 2006 IECC or equivalent	Meets 2006 IECC or ASHRAE 90.1-2004 or equivalent
2	1998-2003 MEC/IECC (meets EPCA[14]); no mandatory state energy code, but significant adoptions of 2003 IECC in jurisdictions	1998-2003 IECC or ASHRAE 90.1-1999/2001 or equivalent; no mandatory state energy code, but significant adoptions of 2003 IECC in jurisdictions
1	Precedes 1998 MEC/IECC (does not meet EPCA)	Precedes ASHRAE 90.1-1999 or equivalent (does not meet EPCA)
0	No mandatory state energy code	No mandatory state energy code

[14] 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.

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	4.5	2	**7**
Oregon	4	4	4	2	**6**
Washington	4	4	4	2	**6**
Pennsylvania	5	5	5	1	**6**
District of Columbia	5	5	5	1	**6**
Florida*	4	5	4.5	1	**5.5**
Maine*	5	5	5	0.5	**5.5**
Maryland	5	5	5	0.5	**5.5**
New Hampshire	5	5	5	0.5	**5.5**
Rhode Island*	5	5	5	0.5	**5.5**
Idaho	3	3	3	2	**5**
Minnesota	3	3	3	2	**5**
Delaware	5	5	5	0	**5**
New York	3	3	3	1.5	**4.5**
Virginia*	3	3	3	1.5	**4.5**
North Carolina	4	3	3.5	1	**4.5**
Wisconsin	3	3	3	1	**4**
Kentucky	3	3	3	1	**4**
Utah	3	3	3	1	**4**
Georgia	4	3	3.5	0.5	**4**
Nevada	3	3	3	1	**4**
Iowa	3	3	3	1	**4**
Connecticut	3	3	3	1	**4**
Arkansas	2	2	2	2	**4**
New Mexico	3	3	3	0.5	**3.5**
Vermont*	2	3	2.5	1	**3.5**
New Jersey*	3	3	3	0.5	**3.5**
Illinois*	2	4	3	0.5	**3.5**
Ohio	3	3	3	0.5	**3.5**
Michigan*	4	3	3.5	0	**3.5**
Montana*	2	2	2	1	**3**
South Carolina	3	3	3	0	**3**
Texas*	2	2	2	1	**3**
West Virginia*	2	2	2	1	**3**
Louisiana	3	3	3	0	**3**
Colorado	2	2	2	1	**3**
Oklahoma	2	2	2	0	**2**
Nebraska	2	2	2	0	**2**
Alaska	4	0	2	0	**2**
Hawaii	1	2	1.5	0	**1.5**

State	Stringency			Compliance Efforts* Score	Overall Score
	Residential State Energy Codes	Commercial State Energy Codes	Score (Average)		
Kansas	0	3	1.5	0	**1.5**
Indiana*	2	1	1.5	0	**1.5**
Missouri	1	1	1	0	**1**
Tennessee	2	0	1	0	**1**
Arizona	0	0	0	0.5	**0.5**
Alabama	0	0	0	0	**0**
Mississippi	0	0	0	0	**0**
North Dakota	0	0	0	0	**0**
South Dakota	0	0	0	0	**0**
Wyoming	0	0	0	0	**0**

Sources: Stringency scores derived from publicly available information, such as BCAP (2009) and DOE (2009), as of September 2009. Compliance and enforcement scores based on information gathered through survey of state building code contacts.

* 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.

Figure 3. Leading States: Building Energy Codes

Florida: In June 17, 2008, Governor Charlie Crist signed HB 697, which requires the Florida Building Commission to select the most current version of the International Energy Conservation Code as a foundation code. But Florida has committed to modifying the foundation IECC in order to maintain the efficiencies of the Florida Energy Efficiency Code for Building Construction (FEECBC). The Commission is also directed by HB 697 to include provisions in each edition of the FEECBC that increase energy efficiency, by 20% in the 2010 FEECBC relative to the 2007 edition, and successively by 30%, 40%, and 50%, in the 2013, 2016, and 2019 editions.

Washington, D.C.: Beginning December 26, 2009, builders in the District of Columbia must comply with the 2008 D.C. Construction Codes. Adopted December 3, 2008, the code became effective immediately but a one-year transition period was given during which permit applications could also use the previous code. The residential section of the 2008 D.C. Construction Codes are based on the 30% Solution, which is a comprehensive proposal designed by the International Code Committee to boost the residential energy efficiency by 30% above the current version of the IECC. The commercial section of the D.C. codes is based on ASHRAE 90.1-2007 and is considered to be more stringent.

California earns the maximum score of 7 points because its state-developed code is considered to be more stringent than the highest IECC standards and it has also been estimated to have one of the highest rates of compliance. 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, down from twelve in our 2008 Scorecard. The eleven are Kansas, Alaska, Illinois, Arizona, Tennessee, Alabama, Mississippi, Missouri, North and South Dakota, and Wyoming. Seventeen states have zero or no verifiable rates of compliance.

CHAPTER 4: COMBINED HEAT AND POWER

Authors: Nate Kaufman and Anna Chittum

Combined heat and power (CHP) systems generate electricity and thermal energy in a single, integrated system. CHP is more energy efficient than separate generation of electricity and thermal energy because heat that is normally wasted in conventional power generation is recovered as useful energy. That recovered energy is used to satisfy an existing thermal demand, such as the heating and cooling of a building or water supply. 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 five factors considered when scoring CHP for the 2009 Scorecard are:

- Standard interconnection rules
- 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

Many 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. We considered policies that were in place as of June 2009 in our review. Our methodology has changed slightly since 2008, with certain policies having more weight in the overall score than they previously held.

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 several secondary sources — such as the *Database for State Incentives for Renewable Energy* (DSIRE 2009) and the Environmental Protection Agency's *CHP Partnership* database (EPA 2009) — as well as primary sources such as public utility commission dockets and interviews with commission staff and utility representatives. Having multiple levels (or 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 thus larger potential economic gains — often have more incentive to spend time and money to interconnect their more complex systems than do customers with smaller projects facing smaller economic returns. Additionally, interconnection standards that have higher size limits are preferred by CHP developers, as are standards that are based upon widely accepted industry standards, such as the IEEE 1547 standard.[15] Finally, having clearly delineated procedural steps toward interconnection and easily accessible information is viewed favorably.

The second most weighted policy is the **standby rates** used by the largest 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

[15] This standard establishes criteria and requirements for interconnection of distributed resources (DR) 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.

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. Generally, standby rates that base a larger percentage of their total standby charge on energy charges are viewed as more favorable to CHP than rates that are based heavily on demand charges. Energy charges reflect the true economics of CHP better than demand charges, because 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 keeps the heightened demand charge high for a multi-month period. Some ratchets last for a year or longer.

The third most weighted CHP policy is the presence of **incentives for CHP**. Tax incentives are generally 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, 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 that exclusively encourage systems with renewable energy sources such as biomass are not given credit here, as CHP systems increase efficiency regardless of input fuel, and should be encouraged across fuel sources. Additional information on incentives for CHP is available from EPA through its CHP Partnership (EPA 2009) and from the Database for State Incentives for Renewable Energy (DSIRE 2009).

The fourth most weighted policy 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 separate generation of electricity and thermal energy. Additional information for policies in this category is also available from EPA via its Partnership Web site.[16]

The final policy used to calculate states' overall CHP scores is the eligibility of **CHP for credit in a renewable portfolio standard (RPS) or energy efficiency resources standard (EERS)**. 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.

States are scored for CHP on a scale of 0 to 5 on their efforts to encourage CHP though regulatory and financial mechanisms, specifically through the five policy categories listed in Table 18.

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

Table 18. State Scoring for CHP

State	Interconnection	Standby Rates	Incentives	OBR	RPS or EERS	Overall Score*
Connecticut	6	2	3	+++	++	5
Ohio	6	2	4	++	++	5
Texas	6	3	0	+++	++	5
California	6	3	1	+++		5
Oregon	3	3	4	+++		5
Illinois	6	3	0	+++		5
New York	4	2	3	+++		5
District of Columbia	6	5	0			4
Wisconsin	5	3	0	+++		4
Massachusetts	4	2	0	+++	++	4
Maine	0	5	0	+++	++	4
Indiana	4	3	0	+++		4
New Jersey	4	3	0	+++		4
Pennsylvania	3	3	2		++	4
North Carolina	4	2	2		++	3
Washington	4	2	0	+++	++	3
Colorado	4	3	0		++	3
Maryland	6	3	0			3
Minnesota	6	3	0			3
Florida	3	2	4			3
South Dakota	6	2	0		+	3
Hawaii	2	4	0		++	3
Delaware	2	3	0	+++		3
Vermont	2	2	3			2
New Mexico	6	1	0			2
Idaho	0	3	3			2
Missouri	0	3	0	++		2
Nevada	0	3	0		++	2
Alaska	0	3	1			2
Michigan	3	1	1			2
New Hampshire	0	3	0	+		2
Arkansas	0	2	0	++		2
Montana	0	3	0			1
Rhode Island	0	3	0			1
West Virginia	0	3	0			1
Mississippi	0	2	1			1
North Dakota	0	2	0		+	1
Alabama	0	1	2			1
Kansas	2	1	0			1
Arizona	0	2	0			1

* The overall scores for state CHP policies are derived from weighted averages of the five policies in examination, which are then divided into sextiles, with a minimum score of zero and a maximum score of five. The CHP team welcomes inquiries by states to learn more about the details of how policies were weighted and how scores were derived in this section of the Scorecard.

State	Interconnection	Standby Rates	Incentives	OBR	RPS or EERS	Overall Score*
Kentucky	0	2	0			1
Nebraska	0	2	0			1
Tennessee	0	2	0			1
Oklahoma	0	1	1			1
South Carolina	1	1	0			1
Utah	0	1	0		+	1
Georgia	0	1	0			0
Iowa	0	1	0			0
Louisiana	0	1	0			0
Virginia	0	1	0			0
Wyoming	0	1	0			0

Figure 4. Leading States: Combined Heat & Power

Texas: Texas, a state that helped pioneer many of the regulatory policies that encourage CHP, and the state with the most installed CHP capacity in the country, has had an interconnection standard in place since 1999. The standard applies to systems up to 10 MW in capacity. Texas has CHP-friendly standby rates, and its emissions regulations provide credit for thermal output for highly efficient CHP systems. CHP is also explicitly included as a key component of Texas's Energy Efficiency Goal. All of these favorable regulatory policies have enabled Texas to be a true leader in CHP installation, despite the limited presence of financial incentives for CHP deployment.

Ohio: Ohio established an interconnection standard in 2007 that provides three size tiers of interconnection procedure based on system size, with systems up to 20 MW eligible for grid interconnection. In May 2008 the state legislature enacted an Alternative Energy Resource Standard that includes CHP as a qualified alternative energy resource. Ohio also offers financial incentives for CHP installation, including property and corporate tax exemptions for waste heat recovery systems and Advanced Energy Program Grants through the Ohio Department of Development. Also, financing for CHP and waste energy recovery is available through the Ohio Air Quality Development Authority (OAQDA).

Illinois: Illinois's interconnection standards, created in 2008, provide four levels of interconnection for systems up to 10 MW of capacity. A docket is currently open to establish rules for requests for systems larger than 10 MW. Emissions regulations in Illinois are output-based, and CHP has been deemed an eligible technology for energy efficiency set-aside allowances.

CHAPTER 5: STATE GOVERNMENT INITIATIVES

Authors: Michael Sciortino and Sarah Black

Background

A state can be directly involved in the advancement of energy efficiency in a number of ways, and this chapter is dedicated to the initiatives that state governments design, fund, and implement. These programs and policies present clear reflections of a state's commitment to energy efficiency, evident in the availability of financial incentives for consumers, businesses, and industry; energy characteristics of its facilities and fleets; and the quality of its research, development, and deployment activities. These programs are typically run by state energy offices, which oversee most aspects of the energy policy portfolio of the state. Unlike programs and policies determined by utility commissions, utilities or state entities designed to administer public benefits funds, which are covered in Chapter 1, the initiatives featured in this chapter fall under

the discretion of state governments. While there is some overlap in program implementation, for example where state tax credits are administered through public benefits entities, this chapter is designed to capture energy efficiency programs not already covered in Chapter 1.

State government initiatives play important roles for the advancement of energy efficiency. "Lead by example" policies and programs improve the energy performance of its facilities and fleets, but equally important, these initiatives showcase cost-effective energy efficiency solutions. State governments can promote innovative energy efficiency measures by funding research, development, and deployment initiatives through local universities or research centers. Financial incentives offered by state agencies can be a deciding factor for consumers or businesses to invest in energy-efficient technologies or services.

Methodology

States can earn a maximum of seven 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, & deployment (RD&D).

We rely on the *Database of State Incentives for Renewable Energy* (DSIRE 2009) to gather information on current state tax and other financial incentive programs for buildings and equipment efficiency. Points are not given for utility-sponsored or public benefit fund financial incentive programs (which are covered in Chapter 1), but rather state incentives only. States earn 1 point for each major incentive program and are capped at a maximum of 3 points (see Table 19). Points are allocated depending on the strength of the programs: for example, a state with several minor programs (Minnesota) is considered equivalent to a state with one or two major programs (Delaware). States are also given credit for home disclosure laws, which require homeowners to disclose information about the energy efficiency of their homes when the homes are placed on the market. Only a handful of states currently require efficiency disclosure: Kansas, Nevada, Massachusetts, Texas, and Washington D.C. These energy efficiency home disclosure laws were taken into account when calculating the overall scoring.

Our review of state lead by example initiatives is largely based on EPA's policy review of LBE programs and policies (EPA 2008). States earn a maximum of 2 points in the LBE category: 1 point for energy savings targets in new and existing state buildings; and 1 point for fleet efficiency mandates. Legislation, plans, policies, and executive orders all count as LBE programs as long as specific action on the part of an identified agency is required (plans that promote, but do not require LBE action, are not included). For state fleet initiatives, states only earn a point if the plan or policy makes a specific, mandatory requirement for increasing state fleet efficiency. For state efficient fleet initiatives, policies listed must make 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 ASERTTI and the size of effort relative to population as assessed by ACEEE staff. The review also considers responses from state officials to an information request on state-level RD&D activities. A state can receive up to 2 points in this category.

Table 19. Summary of Scoring on State Government Initiatives

State	Financial and Information Incentives (3 Points)	Lead by Example: Building Requirements (1 point)	Lead by Example: Efficient Fleets (1 point)	RD&D (2 points)	Total
California	1	1	1	2	**5**
Pennsylvania	3	1	1	0	**5**
New York	2	1	0	2	**5**
Connecticut	2	1	1	0.5	**4.5**
Oregon	3	1	0	0.5	**4.5**
Maine	2	1	1	0	**4**
Massachusetts	2	1	0	1	**4**
Minnesota	2	1	1	0	**4**
New Hampshire	2	1	1	0	**4**
North Carolina	1	1	0	2	**4**
Vermont	2	1	1	0	**4**
Wisconsin	1	1	0	2	**4**
Illinois	2	1	0	0.5	**3.5**
Delaware	2	1	0	0	**3**
Florida	0	1	1	1	**3**
Idaho	2	1	0	0	**3**
Indiana	1.5	1	0	0.5	**3**
Iowa	0	1	0	2	**3**
Kansas	1	1	1	0	**3**
Louisiana	1	1	1	0	**3**
Maryland	2	1	0	0	**3**
Montana	1	1	1	0	**3**
Virginia	1	1	1	0	**3**
Texas	1	1	0	1	**3**
Colorado	2	1	0	0	**3**
Nevada	2	1	0	0	**3**
Missouri	1	1	0	0.5	**2.5**
Arizona	1	1	0	0	**2**
District of Columbia	1	1	0	0	**2**
Hawaii	0	1	1	0	**2**
Kentucky	1	1	0	0	**2**
Michigan	1	1	0	0	**2**
New Mexico	1	1	0	0	**2**
Ohio	1	1	0	0	**2**
Oklahoma	1	1	0	0	**2**
Rhode Island	0	1	1	0	**2**
Tennessee	1	1	0	0	**2**
Utah	0	1	1	0	**2**
Washington	1	1	0	0	**2**
West Virginia	0	0	0	2	**2**
Alabama	0	1	1	0	**2**
Alaska	1	0	0	0	**1**
Mississippi	1	0	0	0	**1**

State	Financial and Information Incentives (3 Points)	Lead by Example: Building Requirements (1 point)	Lead by Example: Efficient Fleets (1 point)	RD&D (2 points)	Total
Nebraska	1	0	0	0	**1**
New Jersey	0	1	0	0	**1**
South Carolina	0	1	0	0	**1**
South Dakota	1	1	0	0	**1**
Arkansas	0	0	0	0	**0**
Georgia	0	0	0	0	**0**
North Dakota	0	0	0	0	**0**
Wyoming	0	0	0	0	**0**

Financial and Information Incentives

State financial incentives for energy efficiency are an important instrument to spur the adoption of technologies and practices in homes and businesses. Home disclosure laws and other types of information incentives improve consumers' purchasing power by raising awareness of the energy usage of homes on the market, which can have a significant impact on the economic value of a home from a retail perspective. Financial incentives can take many forms: rebates, loans, 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 net cost of efficient products to consumers and businesses, reducing the additional costs relative to standard models. Incentives can 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.

Oregon receives the maximum score of 3 points for its various programs, which include the Residential and Business Energy Tax Credits, two major incentive programs that provide credits for purchases of energy-efficient appliances and HVAC systems, as well as for technologies that supply renewable energy, like wind and photovoltaics.

Table 20. State Scoring on Major Financial and Information and Incentive Programs

State	Major Financial Incentive Programs	Score
Oregon	Residential and business energy tax credit. Seven rebate programs	3
Pennsylvania	Alternative Energy Fund. Six grant programs. Three loan programs.	3
Connecticut	Two loan programs, two grant programs, two rebate programs, sales and use tax exemption for energy-efficient products. Use of RGGI-funds for energy efficiency programs.	2
Delaware	Two grant programs; use of RGGI funds for energy efficiency.	2
Idaho	Insulation income tax deduction. Low interest energy loan program.	2
Illinois	Manufacturing Energy Efficiency Program. Two grant programs.	2
Maine	Two rebate programs, two loan programs, and allocation of RGGI funds to Efficiency Maine.	2
Maryland	Income Tax Credit For Green Buildings (personal & corporate). Property tax exemption for high performance buildings. Two loan programs, use of RGGI funds for energy efficiency incentives.	2
Massachusetts	Alternative Energy and Energy Conservation Patent Exemption (personal & corporate). Use of RGGI-funds for efficiency programs.	2
Minnesota	Four loan programs	2
New Hampshire	Renewable Energy And Energy Efficiency Business Loan. Use of RGGI funds for energy efficiency.	2

State	Major Financial Incentive Programs	Score
New York	Green Building Tax Credit Program (personal & corporate). Energy conservation improvements property exemption. Five rebate programs, two grant programs, two loan programs. Use of RGGI funds for a revolving loan program.	2
Vermont	Nine rebate programs, two loan programs, use of RGGI funds for energy efficiency.	2
Indiana	Corporate Energy Savings Tax Credit, Personal Energy Savings Tax Credit, two loan programs.	1.5
Nevada	Property tax abatement for green buildings; home energy disclosure at time of sale.	1.5
Alaska	Four loan programs, one rebate program.	1
Arizona	Income tax subtraction for energy-efficient residences	1
California	Tax deduction for interest on loans for energy efficiency. Two loan programs.	1
Colorado	Low-interest ENERGY STAR Homes Mortgage	1
District of Columbia	Energy efficiency disclosure law in place.	1
Kansas	Kansas Energy Efficiency Program (KEEP) and energy efficiency disclosure required for new residential buildings.	1
Kentucky	Energy efficiency tax credits (personal & corporate).	1
Louisiana	Home Energy Rebate Option. Home Energy Loan Program.	1
Michigan	Energy Efficient Home Improvements Tax Credit. Two grant programs.	1
Mississippi	One loan program	1
Missouri	Tax deduction for home energy efficiency improvements.	1
Montana	Energy conservation installation tax credit. Tax deduction for energy-conserving investment.	1
Nebraska	Dollar and Energy Savings Loans	1
New Mexico	Sustainable Building Tax Credit (personal & corporate). Bond program.	1
North Carolina	Energy Improvement Loan Program (EILP)	1
Ohio	ODOD — Advanced Energy Program Grants	1
Oklahoma	Energy Efficient Residential Construction Tax Credit	1
Tennessee	Small Business Energy Loan Program	1
Texas	Energy efficiency disclosure laws in place.	1
Virginia	Property tax assessment for energy-efficient buildings.	1
Washington	Manufacturing Efficiency Grant Program	1
Wisconsin	Wisconsin Energy Independence Fund (WEIF). Four rebate programs.	1
South Dakota	Energy efficiency disclosure required for new residential buildings.	0.5

Source: Database of State Incentives for Renewables and Efficiency (DSIRE 2009)

Incentive Programs for Agriculture

In addition to homes and businesses, there are many incentive programs specifically targeted to improving the energy efficiency of agricultural operations. This section provides some examples from a few states, offering a brief glimpse of available opportunities in this sector. Future Scorecard reports will include a more comprehensive view of state and utility-run agricultural program offerings, which will contribute toward state scores.

The *2008 Farm Bill* provided extensive funding for the U.S. Department of Agriculture (USDA) *Rural Energy for America Program* (REAP), with many states leveraging these funds at the local level to aid farmers, ranchers, and rural small businesses in purchasing and installing energy-efficient equipment. Vermont's in-state USDA-Rural Development office uses this funding to provide grants and loan guarantees for on-farm equipment including reverse osmosis units used in maple sugaring and dairy milk plate coolers. Together, grants and loan guarantees can

potentially cover 75% of project costs. The in-state program also leverages local funding through the Vermont Agricultural Credit Corporation, private banks, and Efficiency Vermont.

Figure 5. Leading States: State Financial and Information Incentives

Pennsylvania: In July 2008, Governor Edward Rendell signed the Alternative Energy Investment Act into law, creating a $650 million alternative energy fund. Energy efficiency allocations of the fund include $40 million to help start-up businesses involved in energy efficiency technologies and $25 million in grants and loans to improve the energy efficiency of new and existing homes and small business buildings. The law also includes $92.5 million that will be allocated over the next eight years to support loans, grants, and rebates for up to 25% of the cost of energy efficiency improvements to homes and small businesses. The state also offers six grant programs for large and small businesses, schools, nonprofit organizations, and governments.

Missouri: In July 2008, the state of Missouri enacted legislation allowing homeowners to deduct from their income taxes the cost of home energy audits and energy efficiency improvements based on recommendations made in such an audit. The tax deduction is valid for expenses of this nature incurred on or after January 1, 2009. The deduction has $1,000 limit per individual or joint taxpayer return and a $2,000 cumulative limit per individual or joint taxpayer. All deductions must be taken in the year in which the expenses were incurred. A taxpayer may not take a deduction for work that received any sort of incentive or rebate through the state or through a utility-sponsored program. This tax incentive will expire on December 31, 2013.

Wisconsin's *Agricultural Development and Diversification Grant Program* provides competitive grants for projects that stimulate the agricultural economy by developing new value-added products, markets, or technologies. The program, funded through and administered by the Wisconsin Department of Agriculture, Trade and Consumer Protection, has a current budget of $380,000 and provides grants of up to $50,000 per project.

States often contract through a third-party organization to help administer agricultural incentive programs. One such firm, EnSave, provides agricultural producers and food processors with cost-effective programs that save energy and reduce operating costs. A number of states contract with EnSave to run farm audit programs, including Maryland's *Statewide Farm Energy Audit Program*. This program initially began in 2007 as a pilot program targeted toward farmers in the eastern and western-most counties, providing participants cost-shared farm energy audits. The program disbursed over $38,000 in incentives and saved the state more than 635,000 kWh annually (EnSave 2009). Currently funded through the Maryland Energy Administration at $950,000 for three years, the now statewide program provides energy audits and technical assistance as well as cash incentives to state agricultural producers.

North Carolina's *Farm Energy Efficiency Project* (FEEP), administered by the North Carolina Farm Bureau in conjunction with EnSave and other auditors, defrays the cost of farm energy assessments and aids farmers in making energy efficiency improvements to existing facilities and equipment. Program funding comes from the NC Tobacco Trust Fund Commission, with a budget of $125,000 for 2009 projects. The program has overseen 53 audits since the project's inception in 2008, with average farm savings of over $16,000 and 733 mmBtus (FEEP 2009).

California's *Agriculture Loan Solicitation,*[17] administered through the California Energy Commission (CEC), aggressively promotes energy-efficient emerging technologies by providing below market-rate loans for the design, purchase, and installation of proven technologies applicable to the agricultural and food processing industries. The program allocates $3 million dollars in loans for a select group of technologies that have been researched, developed, and demonstrated under the CEC's *Public Interest Energy Research* (PIER) program.

[17] For more information on this program, see http://energy.ca.gov/process/agriculture/loan_solicitation.

In addition to state-run programs, many utilities have wide-reaching and effective programs targeted to agricultural energy efficiency incentives. In California, for example, the investor-owned utilities provide the bulk of energy efficiency programs for the agricultural sector, the largest of which is PG&E's *Agriculture and Food Processing* initiative, which includes a number of incentive programs. One, the *Dairy Energy Efficiency Program,* is funded by PG&E and administered by EnSave. The program is currently funded at $517,404, which is used for a variety of cash incentives geared toward efficient equipment purchasing (e.g., variable-speed drives, lighting, ventilation, etc.). PG&E estimates that $83.7 million will be spent on agricultural programs between 2009 and 2011 (Clinton 2009).

Irrigation is perhaps the most energy-intensive activity within the agricultural sector, and has become an important issue for states dealing with water scarcity as well as increased energy demand. The Nebraska Public Power District (NPPD) provides financial incentives for irrigation-related projects through the *EnergyWise*™ program run through the local electric utilities. The program pays for the costs associated with pump efficiency tests up to $350 and provides an additional incentive of $0.20/kWh saved for farmers or ranchers improving the energy efficiency of their irrigation systems. In California, PG&E's *Agricultural Pumping Efficiency Program* (APEP) uses public purpose funding under the California Public Utility Commission to subsidize irrigation pump efficiency tests and provide cash incentives for pump retrofits. APEP is managed by the Center for Irrigation Technology (CIT), with the goal of encouraging both energy and water conservation. From 2002–2008 the program dispensed over $4 million for pump retrofit, repair, or efficiency tests. CIT estimates that those pump retrofits and repairs save 36,700,000 kWh annually (CIT 2009).

Lead by Example

A state's own facilities, fleets, and operations offer a unique opportunity for state governments to lead by example, incorporating energy efficiency measures into their facilities and achieving significant energy cost savings. State governments have often become leaders in energy efficiency by taking action through legislation or executive order to improve efficiency in their own buildings and vehicles. As states face the dual challenges of cutting energy costs and greenhouse gas emissions, these policies help improve the environmental and economic performance of states' assets while promoting energy conservation to the broader public.

State and local governments operate many 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 2008). 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). LBE initiatives reduce electricity in state buildings and fuel consumption in state vehicle fleets, providing benefits beyond cost savings. These initiatives demonstrate leadership, reduce air pollutants and greenhouse gases, and foster local economic development in vital technological and service sectors.

Across the country, LBE initiatives have proven to be a popular way for states to begin implementing energy efficiency policy. Only eight states have yet to implement some energy efficiency requirement for public facilities or fleets. 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 construction and retrofit projects, lowering energy bills and promoting economic development in the energy services and construction sectors. States pursue efficient vehicle fleet policies, creating an opportunity for states to significantly reduce fuel costs and create a hedge against rising fuel prices. Some states require the purchase of a certain proportion of alternative fuel while others require a percentage of vehicles be hybrid or use alternative fuel. The presence of a definitive efficiency standard, however, is an optimal tool that ensures a reduction in fuel consumption and greenhouse gas

emissions. Leading by example will be a major policy focus for state governments moving forward with strengthened energy budgets due to Recovery Act funding and other sources. The implementation of energy-conservation technologies in the public sector saves money for taxpayers and promotes a vital message to decision-makers and the public that efficiency works. For a comprehensive description of state lead by example strategies and best practices, see the EPA's most recent Lead by Example Guide (EPA 2008).

Figure 6. Leading States: State Lead by Example Initiatives

Louisiana: In January 2008, Governor Bobby Jindal signed Executive Order BJ 2008-8, which requires the Division of Administration to set energy efficiency goals for state facilities, office buildings, and complexes for fiscal years 2009, 2010, and 2011 by July 30, 2008. The order supplements Senate Bill 240, which requires construction or renovation of major state-funded facilities to be designed and built to exceed state energy codes by at least 30%. Executive Order BJ 2008-8 also directs the Division of Administration to adopt best energy purchasing practices and develop or increase standards for products such as appliances and light bulbs, using ENERGY STAR as a minimum standard. The order also directs the Division of Administration to develop average fuel economy goals for the state automobile fleet and take necessary measures to assure that those goals are met by 2010.

Research, Development, and Deployment (RD&D)

In 1990, several state energy research, development, and deployment institutions established the Association of State Energy Research and Technology Transfer Institutions (ASERTTI) in response to the increasing need for state initiatives in RD&D. 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 promote the creation, development, and commercialization of 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 deployment programs. A diverse set of institutions (including universities, state governments, and utilities) fund and implement RD&D programs for the purpose of energy conservation. Such programs include research on energy consumption patterns in local industries, development of energy-saving technologies at state or university research centers, and deployment through public/private partnerships.

Individual state research institutions exist primarily to 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 other states to benefit from their research. States without these institutions can then use this shared information as a roadmap in order to advance their own efficiency programs.

Figure 7. Leading States: State Research, Development, and Deployment Initiatives

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 newly created Energy Efficiency Center of West Virginia and West Virginia University Building Energy Center will provide centralized locations for the development and deployment of new energy-saving technologies and services. The state is also active in training a new generation of energy managers by sponsoring programs that offer students the opportunity to work with companies to identify and achieve cost-effective energy savings.

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 much 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. 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 on 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 national standards until 1987 through the passing of the National Appliance Energy Conservation Act, which created national standards based on those that had been adopted by California and several other states.

Today the federal government often uses the standards set by states as a model for federal appliance standards. However, federal preemption generally prevents states that wish to increase the stringency of their own appliance standards to do so. Under the general rules of federal preemption 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. This is an effective policy for spreading appliance efficiency across the nation, but does restrict the ability of states to go above and beyond federal mandates.

Methodology

A state can earn up to 3 points for their adoption of appliance efficiency standards. We score states based on the number of appliance efficiency standards not presently preempted by federal standards. Each state earns a score of 0 to 3: 3—more than ten product standards; 2—five to ten product standards; 1—one to four product standards; and 0—no standards. See Table 21 for state scores on appliance efficiency standards. States not listed here had no efficiency standards.

Table 21. State Scoring for Appliance Efficiency Standards

States	Number of Standards Enacted since 2002 (Not Preempted by Federal Legislation	Date Most Recent Standards Adopted	Score
California	12	2008	3
Connecticut	6	2007	2
Maryland	5	2007	2
Massachusetts	3*	2005	2
Oregon	7	2007	2
Rhode Island	5	2006	2
Washington	5	2009	2
Arizona	3	2009	1
District of Columbia	2	2007	1
Nevada	1	2007	1
New Hampshire	3	2008	1
New York	3	2005	1
Vermont	4	2006	1
New Jersey	0	2005	0

Sources: Appliance Standards Awareness Project (ASAP 2009a); DSIRE (2009), as of September 2009
*Note: In addition to standards enacted in Massachusetts, the state earns a point for having developed a waiver of federal standards for gas furnace minimum efficiency. This significant task helped spur manufacturer interest in a negotiated federal standard.

California, scoring a maximum of 3 points, continues to take the lead on appliance efficiency standards, having been the first state to adopt appliance standards in 1976. Not only has California enacted the greatest number of standards, it has also had the greatest success developing product standards not covered by federal preemption. Although several states have made significant efforts to expand their own standards, such as Oregon, Connecticut, Rhode Island, and Washington, EPAct 2005 and EISA 2007 created federal standards that preempted many of those state standards. Without future state initiative to implement standards on products that are not regulated by the federal government, the number of state standards not preempted by federal standards will decrease over the next four years as DOE has plans to update and introduce new standards for 26 products, such as residential furnaces and furnace fans (ASAP 2009b).

Figure 8. Leading States: Appliance and Equipment Efficiency Standards

California: California was the first state in the country to adopt appliance and equipment efficiency standards. The authority to adopt appliance and equipment efficiency standards was bestowed upon the California Energy Commission as stipulated under the Warren-Alquist Act, which was enacted in 1976. California's 2009 Appliance Efficiency Regulations were adopted in December 2008 and became effective on August 9, 2009, replacing all previous versions. The regulations created standards for 23 categories of appliances, including standards for both federally-regulated and non-federally-regulated appliances.

***Massachusetts*:** Massachusetts first enacted appliance efficiency standards in 1986. In 2005, the state expanded the standards to include additional products. The most significant recent development was the state's completion and application submission for a waiver from federal preemption to implement a state standard for home furnaces stricter than federal minimums. This task helped to spur manufacturer interest in a negotiated federal standard for gas furnaces.

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

Authors: Colin Sheppard, Charles Chamberlin, and Arne Jacobson (Shatz Energy Research Center, Humboldt State University)[18]

Note: Findings from this chapter are not included in the overall state rankings of this report, but rather act 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 in the residential sector and provide summary results for each of the lower 48 states. The methodology provides a tool for identifying 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 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.

Methodological Approach

The approach that we use for tracking ECI begins with 32 years of aggregate energy consumption data for the residential sector in each state (1975–2006, inclusive).[19] These data are adjusted according to state population, yielding annual per capita residential energy consumption intensity (MBtu/capita/year). While there are many causes for variation in energy consumption intensity, weather is most clearly beyond the influence of policy makers. 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 population weighted heating and cooling degree days (HDD and CDD[20]), 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.

The result is an adjusted residential sector ECI trend (aECI) 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 10 years preceding (and including) a given test year. States are categorized by the sign of their slope: a downward (negative) slope indicates a decrease in aECI and an upward (positive) slope indicates an increase in aECI over the 10-year term.

Measuring Performance

Figure 9 and Table 22 contain the slope of aECI from 1997–2006, where a more negative slope indicates a decreasing trend and therefore better performance. This metric allows the ranking of

[18] Adapted from Sheppard (2009).
[19] 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 Census.
[20] Population weighted heating and cooling degree day data are from the National Climatic Data Center, a division of the U.S. Department of Commerce and the National Oceanic and Atmospheric Administration.

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 10 presents the number of years from 1985 to 2006 in which the 10-year slope of aECI was negative for a particular state. The states with the largest number of negative slopes are the ones that have consistently decreased their aECI over the time period. Figures 11 and 12 illustrate how this metric is determined for the states of California and South Carolina. Finally, in Figure 13, we present adjusted energy consumption intensity (aECI) by state in ascending order for the year 2006. While aECI is weather adjusted, it does not account for inherent climatic and other differences among states (e.g., mild versus extreme weather will have a large influence on the magnitude of aECI). Therefore, aECI alone does not necessarily reflect the strength of state policy or other factors that influence energy efficiency. It is for this reason that we have used the rate of change (i.e., the slope) in aECI over a 10-year time period rather than current year aECI as the basis for evaluating states' progress.

The proposed performance based metric for evaluating states' progress that is described in this chapter differs from the ACEEE's *State Energy Efficiency Scorecard* 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, industrial, and transportation sector policies, while the performance based metric presented here focuses exclusively on the residential sector (although there are plans to expand the analysis to the commercial buildings sector). Additionally, while the ACEEE Scorecard often 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 policies unless those policies result in measurable reductions in weather-adjusted energy 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 results. 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.

Figure 9. Slope of Adjusted Residential ECI from 1997–2006 for Continental U.S. States

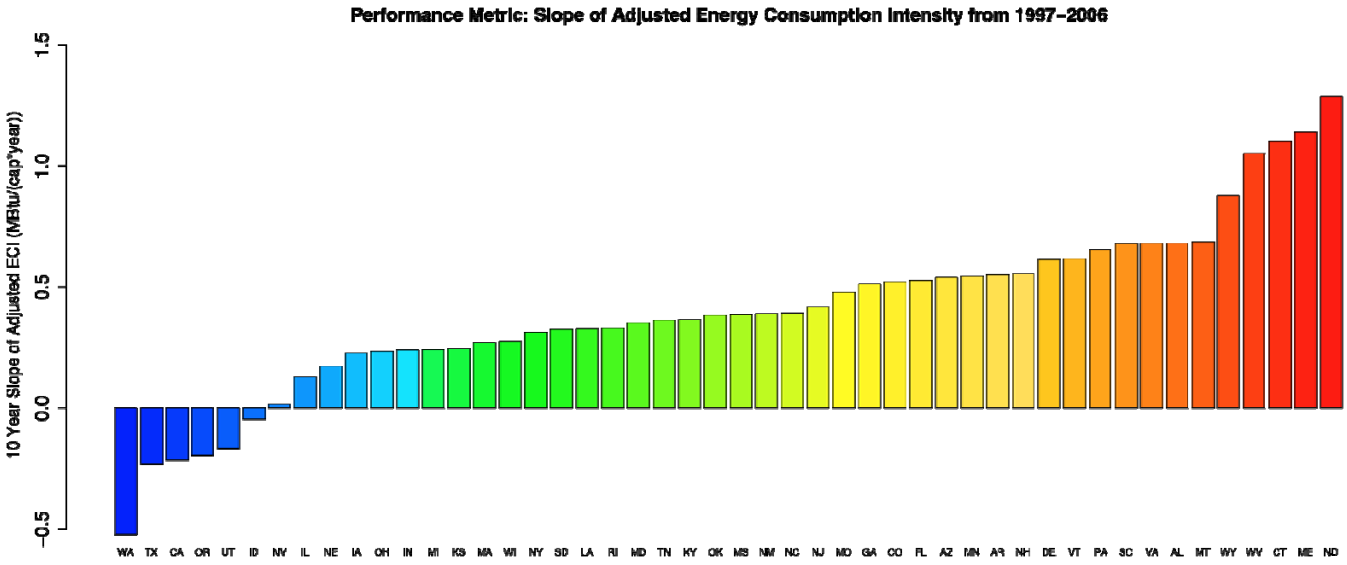
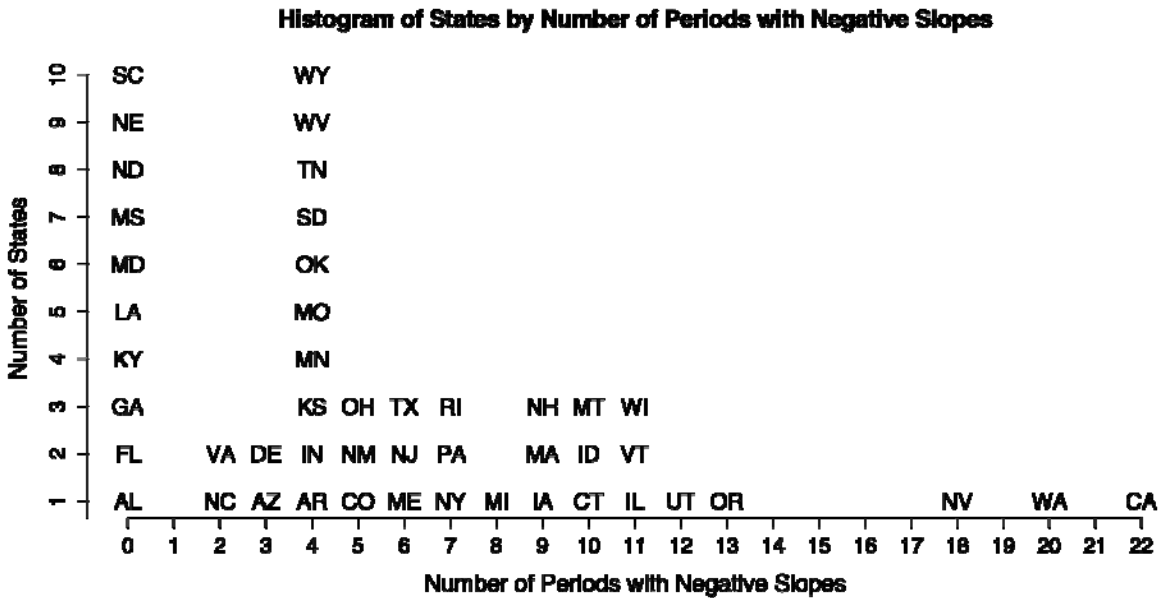


Table 22. State Ten-Year Slopes of aECI from 1997–2006 and Corresponding Rankings

Rank	State	1997–2006 aECI Slope MBtu/cap/year
1	WA	-0.52
2	TX	-0.23
3	CA	-0.22
4	OR	-0.19
5	UT	-0.17
6	ID	-0.05
7	NV	0.02
8	IL	0.13
9	NE	0.17
10	IA	0.23
11	OH	0.23
12	IN	0.24
13	MI	0.24
14	KS	0.24
15	MA	0.27
16	WI	0.27
17	NY	0.31
18	SD	0.33
19	LA	0.33
20	RI	0.33
21	MD	0.35
22	TN	0.36
23	KY	0.36
24	OK	0.38
25	MS	0.38
26	NM	0.39
27	NC	0.39
28	NJ	0.42

Rank	State	1997–2006 aECI Slope MBtu/cap/year
29	MO	0.48
30	GA	0.51
31	CO	0.52
32	FL	0.53
33	AZ	0.54
34	MN	0.54
35	AR	0.55
36	NH	0.55
37	DE	0.61
38	VT	0.62
39	PA	0.65
40	SC	0.68
41	VA	0.68
42	AL	0.68
43	MT	0.68
44	WY	0.88
45	WV	1.05
46	CT	1.1
47	ME	1.14
48	ND	1.29

Figure 10. Histogram of States by the Number of 10-year Periods from 1985-2006 in which the Slope of aECI Was Negative



A Closer Look at Two States

In Figures 10 and 11, we present the result of applying this analysis for the states of California and South Carolina. California shows a generally decreasing trend over the whole time period and in all 22 years from 1985–2006 the state had a negative 10-year slope. South Carolina exhibits an overall increasing trend and had no positive 10-year slopes during the time period.

Figure 11. California Residential Adjusted ECI Trend (Top) and Ten-Year Adjusted ECI Slopes (Bottom). The aECI trend is marked based on whether the corresponding slope term is positive (grey diamond) or negative (green circle).

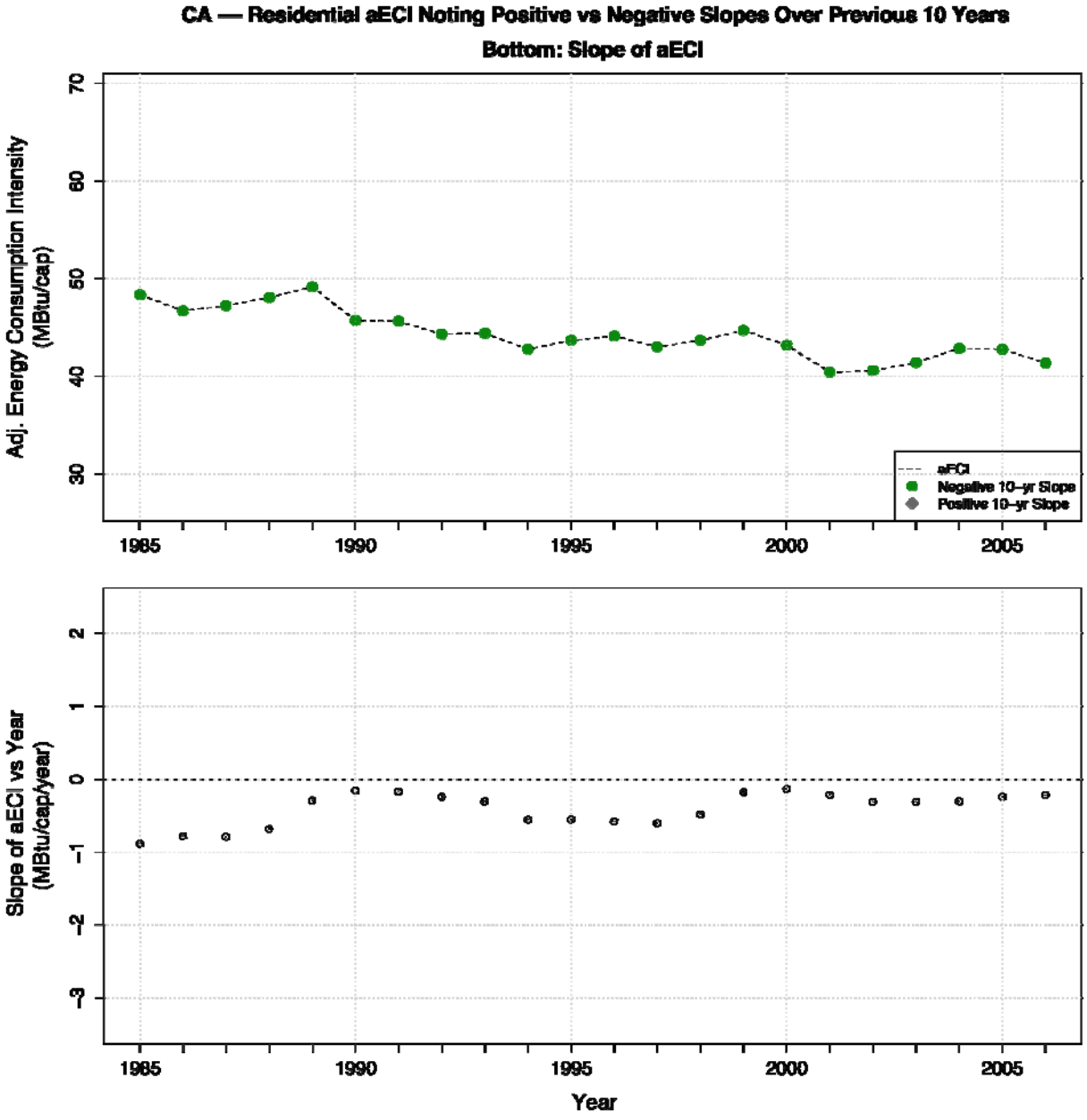


Figure 12. South Carolina Residential Adjusted ECI Trend (Top) and Ten-Year Adjusted ECI Slopes (Bottom). The aECI trend is marked based on whether the corresponding slope term is positive (grey diamond) or negative (green circle).

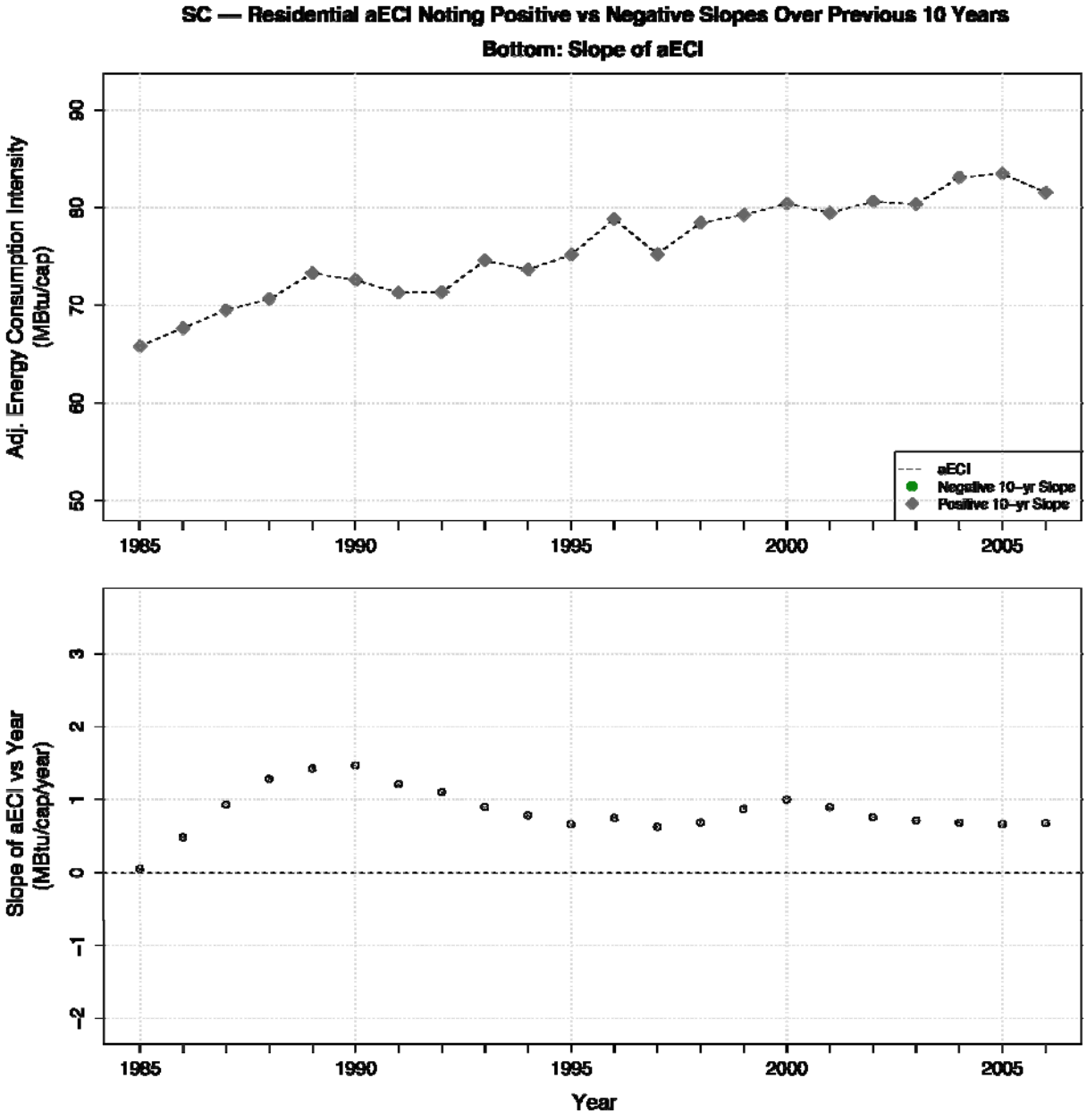
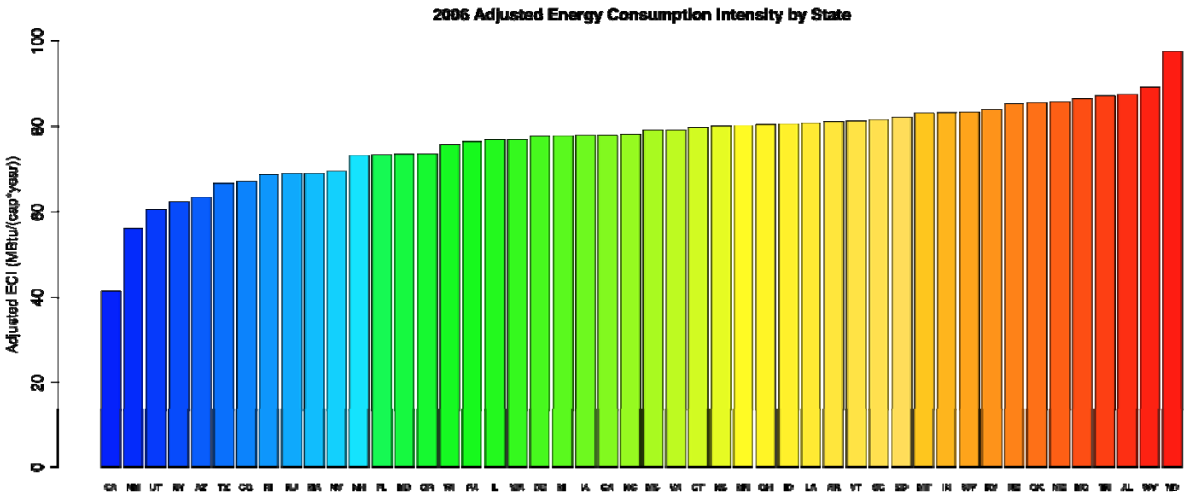


Figure 13. Weather-Adjusted Energy Consumption Intensity for Continental U.S. States



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, it is not possible to isolate changes in ECI that are solely due to policy choices from changes due to other factors with 100% reliability. 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 other sectors, 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. This is particularly an issue for commercial and industrial sectors. In order to more accurately track state level trends in energy efficiency, we recommend the following improvements in data collection and reporting:

1. Quarterly Energy Consumption and HDD/CDD Data: If quarterly, not just annual, energy consumption data were available, the metric would provide a more reliable measure of states' progress toward reducing weather adjusted per capita energy consumption.
2. 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.
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 ensure the accuracy of the data that is collected.
4. Population Weight HDD and CDD using Current Year Populations: Currently, state HDD and CDD values are weighted by the decennial census population data; this should be changed to use annual population estimates.
5. 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. A single agency should be identified to lead the effort and each 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.

6. 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 data collection and processing.

Acknowledgements

This section is the result of an analysis completed by the authors and commissioned by the Center for Market for 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.

CHAPTER 8. DISCUSSION OF SCORECARD RESULTS

The results of the Scorecard are presented again in Table 23 below, and the last column shows the state's change in ranking compared to the 2008 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. Following the table, we provide 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 23. Summary of Overall State Scoring on Energy Efficiency

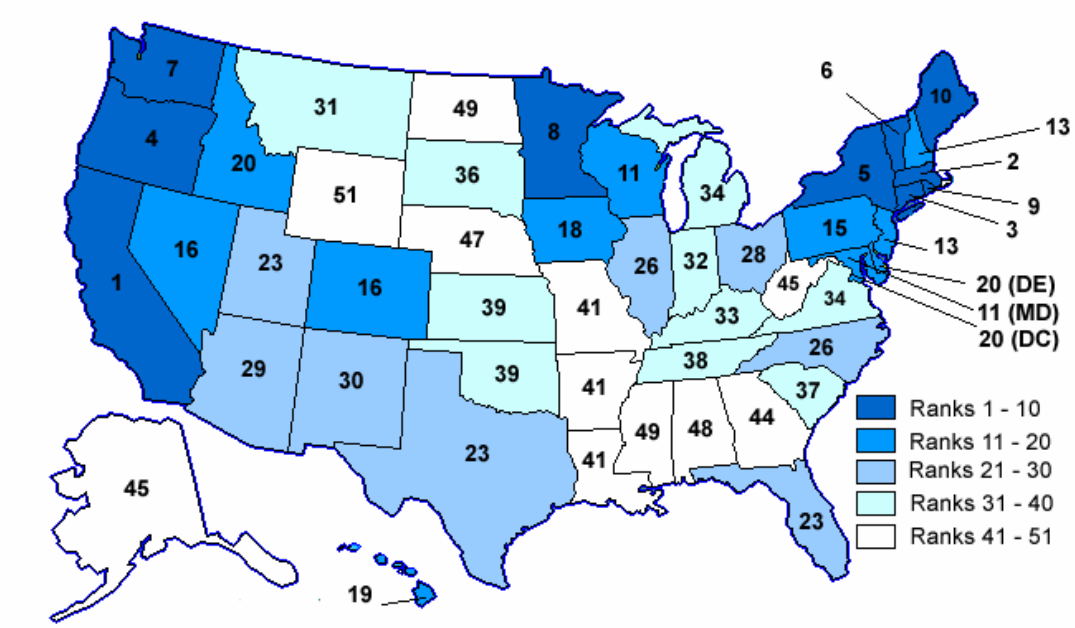
Rank	State	Utility and Public Benefits Efficiency Programs and Policies Score	Transportation Score	Building Energy Code Score	Combined Heat and Power (CHP) Score	State Government Initiatives Score	Appliance Efficiency Standards Score	TOTAL SCORE	Change in Rank from 2008 Results
Maximum Possible Points:		*20*	*8*	*7*	*5*	*7*	*3*	*50*	
1	California	18.5	6	7	5	5	3	44.5	0
2	Massachusetts	17	4	7	4	5	2	39	5
3	Connecticut	17	5	4	5	4.5	2	37.5	0
4	Oregon	14	5	6	5	4.5	2	36.5	-2
5	New York	14	5	4.5	5	5	1	34.5	0
6	Vermont	19	4	3.5	2	4	1	33.5	-2
7	Washington	14	6	6	3	2	2	33	-1
8	Minnesota	16.5	2	5	3	4	0	30.5	-1
9	Rhode Island	13	4	5.5	1	2	2	27.5	2
↑10	Maine	8.5	4	5.5	4	4	0	26	9
11	Wisconsin	11	1	4	4	4	0	24	-2
11	Maryland	5.5	5	5.5	3	3	2	24	1

Rank	State	Utility and Public Benefits Efficiency Programs and Policies Score	Transportation Score	Building Energy Code Score	Combined Heat and Power (CHP) Score	State Government Initiatives Score	Appliance Efficiency Standards Score	TOTAL SCORE	Change in Rank from 2008 Results
13	New Hampshire	11	0	5.5	2	4	1	23	5
13	New Jersey	9.5	5	3.5	4	1	0	23	-3
15	Pennsylvania	3	4	6	4	5	0	22	0
↑16	Colorado	11	1	3	3	3	0	21	8
16	Nevada	11	0	4	2	3	1	21	-1
18	Iowa	13	0	4	0	3	0	20	-4
19	Hawaii	11.5	1	1.5	3	2	0	19	-4
20	Idaho	8.5	0	5	2	3	0	18.5	-7
↑20	Delaware	4.5	3	5	3	3	0	18.5	12
↑20	District of Columbia	1.5	4	6	4	2	1	18.5	10
23	Florida	4	1	5.5	3	3	0	16.5	-4
23	Utah	9.5	0	4	1	2	0	16.5	2
23	Texas	5.5	0	3	5	3	0	16.5	-4
28	Illinois	4	0	3.5	5	3.5	0	16	-7
26	North Carolina	4.5	0	4.5	3	4	0	16	2
26	Ohio	5	0	3.5	5	2	0	15.5	-9
29	Arizona	6.5	4	0.5	1	2	1	15	-1
30	New Mexico	5	2	3.5	2	2	0	14.5	-5
31	Montana	6.5	0	3	1	3	0	13.5	-4
32	Indiana	3.5	0	1.5	4	3	0	12	6
33	Kentucky	4.5	0	4	1	2	0	11.5	-2
34	Virginia	1.5	1	4.5	0	3	0	10	-2
34	Michigan	2.5	0	3.5	2	2	0	10	4
↑36	South Dakota	4.5	0	0	3	1.5	0	9	11
37	South Carolina	2.5	1	3	1	1	0	8.5	-3
↑38	Tennessee	2	2	1	1	2	0	8	8
39	Kansas	2	0	1.5	1	3	0	7.5	-1
39	Oklahoma	1.5	1	2	1	2	0	7.5	4
41	Arkansas	1	0	4	2	0	0	7	-3
41	Missouri	1.5	0	1	2	2.5	0	7	4
41	Louisiana	0	1	3	0	3	0	7	-6
44	Georgia	1.5	1	4	0	0	0	6.5	-8
45	Alaska	0	1	2	2	1	0	6	-8
45	West Virginia	0	0	3	1	2	0	6	-2
47	Nebraska	0.5	0	2	1	1	0	4.5	-9
48	Alabama	0	0	0	1	2	0	3	1
49	Mississippi	0	0	0	1	1	0	2	-2
49	North Dakota	1	0	0	1	0	0	2	0
51	Wyoming	1	0	0	0	0	0	1	0

Differences among States

In this Scorecard, we attempt to plausibly score states on their varying commitments to energy efficiency policies and programs. Readers should note, however, that minor differences in overall state rankings, such as the difference between one to a few ranking positions, should not be viewed as significant. Differences between "bins" of ten states or so, however, provide more real comparisons among state efficiency commitments. See Figure 14 below, which shows the four "bins" of state energy efficiency rankings.

Figure 14. Map of State Energy Efficiency Scorecard Results



Note: Several states that have the same score are tied for the same ranking.

Changes in Scoring Methodology

Some minor changes in scoring methodology compared to last year may affect some of the overall rankings. Transportation policies, for example, were given up to 8 possible points compared to 6 points last year. Maximum possible scores for appliance efficiency standards and building energy code compliance categories, however, each decreased by 1 point.

This year we also reached out to state-level reviewers to verify the accuracy and comprehensiveness of the policy information on which we score the states. Officials at state energy offices were given the opportunity in August to review the material on the ACEEE State Energy Policy Database Web page. Twelve state energy offices responded with comments, including Alabama, Connecticut, Delaware, Indiana, Iowa, Nebraska, New Hampshire, New York, Ohio, South Dakota, West Virginia, and Wisconsin. Regional nonprofits and other state-level organizations also contributed to the review process for Colorado, New Jersey, New Mexico, Texas, and Wisconsin. By providing more accurate and up-to-date information, eleven states improved their score in the rankings by engaging in this process.

"Most Improved" States

Below we highlight the most notable upward movements in the overall state rankings, which may be in part a result of slight changes in our scoring methodology, but are mostly the result of states expanding their efficiency policies and programs.

Delaware moved up twelve spots, from 32nd to 20th, and is one example of a state in the process of implementing significant changes to create and provide energy efficiency programs and services where they have not existed for many years. The state recently established the Delaware Sustainable Energy Utility (SEU) as the nonprofit entity that will operate programs to deliver comprehensive efficiency and customer-sited renewable energy services to Delaware's households and businesses. The SEU will be funded via special purpose bonds issued by the state and will be repaid via a number of mechanisms including shared savings generated from energy efficiency programs as well as from Delaware's existing Green Energy Fund, which is supported by a customer charge on electricity bills. In 2009, Delaware approved an Energy Efficiency Resource Standard (EERS) that sets goals for consumption and peak demand for electricity and natural gas utilities. This leap in utility program planning and establishment of targets was a large factor in Delaware being a most improved state from the 2008 Scorecard, having moved up ten spots.

Maine moved up nine spots and is one of two newcomers to the "top ten" in 2009. This change is due to a variety of increased efforts, including those of Efficiency Maine (the agency which delivers energy efficiency programs), adoption of building energy codes, land-use planning management, and other activities. For example, in 2008 the Maine state legislature established the Maine Uniform Building and Energy Code by setting the 2009 versions of the national model codes as the mandatory building code standards for residential and commercial buildings statewide (BCAP 2009).

Tennessee moved up 8 spots, from 46th to 38th, representing an important upward shift for a state that has performed in the bottom tier on energy efficiency. The state has made some recent improvements in a couple of categories that account for this upward movement. For example, in 2008, Governor Bredesen signed an executive order to reduce energy consumption in state agencies to "lead by example" for businesses and homeowners in the state, and also set up the Governor's Task Force on Energy Policy. The state also passed legislation in 2008 to update its residential building energy codes to the 2003 IECC, which became effective in January 2009, although there is still no mandatory statewide code for commercial buildings. The state's growth management policies also earn points in the transportation policy chapter of this year's Scorecard.

In addition, the Tennessee Valley Authority (TVA), the primary electricity provider in Tennessee, has efforts underway that could lead to much greater funding for programs and increases in energy savings. In its 2007 Strategic Plan, TVA stated its commitment to be a leader in energy efficiency and has since drafted an energy efficiency and demand response plan and an environmental policy. TVA's most recent goals, approved in mid-2008, are to reduce peak demand by 4% by 2012. As part of the ramp-up process, TVA released a suite of pilot energy efficiency programs, including in-home energy auditing programs and prescriptive incentive programs for HVAC technologies. Ten million dollars were spent on energy efficiency programs in Tennessee in 2007, up from about $5 million in 2006.

Colorado moved up eight spots from 24th to 16th, demonstrating leadership in the dynamic Southwest region. Colorado's utilities increased spending on energy efficiency as a percentage of revenues by about 25% from 2006 to 2007 and electricity savings from these measures more than doubled over that period of time. Colorado also continued to refine its aggressive energy efficiency resource standard by adopting natural gas savings goals for its utilities. Colorado's state government has also initiated a series of strong financial incentive programs such as its

ENERGY STAR mortgage program, which allows consumers to access a lower interest rate on new home loans.

South Dakota climbed eleven spots from 47th to 36th thanks to new commitments in its utility sector to energy efficiency. Bolstered by commitments from rural electric cooperatives, which spend around $1.7 million annually on energy efficiency, South Dakota's utility spending increased significantly from 2006 and 2007. The Public Utilities Commission also recently approved programs for two utilities (MidAmerican and Otter Tail) with a financial incentive mechanism based on performance, suggesting that the state's commitments will continue to increase in future years. South Dakota's CHP score benefited from recently enacted legislation (H.B. 1123) establishing a voluntary *objective* that 10% of all retail electricity sales in the state be obtained from renewable and recycled energy by 2015. In March 2009, this policy was modified by also allowing "conserved energy" to meet the objective, which includes CHP.

Washington D.C. moved up ten spots from 30th to 20th, largely due to major improvements in building energy codes and transportation policies. For residential buildings, builders may now use either the 2008 D.C. Construction Codes, which is based on the "30% Solution" and is more stringent than the 2009 IECC, or the previous code adopted in 2003, which is based on the 2000 IECC. For commercial buildings, builders may use either the 2008 D.C. Construction Codes, based on ASHRAE 90.1-2007, or the previous code adopted in 2003, which is based on the 2000 IECC. The District also adopted the California Clean Car Standard in May 2008 committing to the regulation of carbon dioxide emissions from vehicles of model year 2011 onward. In 2008, D.C. also became the first city in the nation to mandate ENERGY STAR benchmarking and public disclosure for private and government buildings. The mandate does not apply to residential buildings.

Looking Ahead to 2010

In addition to the many states that have moved up in the rankings compared to last year's report, we see signs that states are continuing to raise the bar on energy efficiency. Next year, we will see notable improvements from these states. For example, Pennsylvania, Michigan, Ohio, and Delaware all passed Energy Efficiency Resource Standards in late 2008 or mid-2009, foreshadowing significantly increased efficiency program activity in those states in the next couple of years. North Carolina, Illinois, and Missouri also have plans for rapid change in utility-sector energy efficiency program spending, though our data do not yet reflect these changes.

Future 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 to continue to refine our 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 funding to collect the required data to estimate a state's level of compliance. While states should 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 incorporated. This year's inclusion of building energy code compliance, based on a state-by-state review of compliance and enforcement activity, is an improvement over last year's Scorecard, and we hope to continue to refine a survey of state code compliance in the future.

To score states on utility and public benefits programs, ideally we wanted to report recent program spending and savings for both electricity and natural gas across all sectors. This chapter, however, only captures energy savings and efficiency program spending data for programs that were administered in 2007. This time lag is partly due to the timing of data released by the Energy Information Administration and also inconsistencies among states on reporting recent data. Several states had 2008 actual spending and savings data, however many did not yet have these data available. For next year's Scorecard, we plan to explore ways to capture a more recent picture of energy efficiency spending and savings data. Also, the utility-sector and public benefits programs chapter largely captures data for residential and commercial efficiency programs, which is reported by state utility and non-utility program administrators. Little information exists on state spending and savings data for industrial efficiency programs, which are often run by other, smaller program administrators. This year's "State Government Initiatives" attempts to capture some of these non-utility programs. Next year, we hope to develop a more comprehensive definition and assessment of state efficiency programs that fall outside the realm of utility-sector and public benefits programs.

Given these data limitations, we also plan to explore including the performance-based measure of changes in state-level energy consumption data (as reported in Chapter 7) into the Scorecard metrics. This captures electricity, natural gas, and other building level fuel use (e.g., fuel oil). While this data is also not perfect, it provides another valuable measure of energy efficiency performance to the Scorecard. We hope to be able to include both energy consumption in the residential and commercial sector as a factor in future versions of the Scorecard.

CONCLUSION

In 2009, states continue to lead the nation in advancement of energy efficiency policies and programs. This Scorecard serves to recognize and document these important contributions, both to encourage other states to follow and to inform ongoing energy and climate federal policy discussions about effective energy efficiency policy solutions. Energy efficiency is the only resource that can actually *reduce* energy consumption to combat rising energy demand and create a hedge against rising energy prices — making efficiency the "first fuel" states can use to balance their energy portfolios.

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APPENDIX A. UTILITY-SECTOR ENERGY EFFICIENCY SPENDING PER CAPITA

2007 Electricity Efficiency Program Spending by State: Total, Percent of Revenues, and Per-Capita

State	2007 Total Spending* ('$1000)	Spending as Percent Revenues	Spending per Capita
Vermont	$23,690	3.4%	$38.13
Washington	$126,678	2.6%	$19.58
California	$755,279	2.2%	$20.66
Oregon	$69,107	2.1%	$18.44
Connecticut	$95,716	2.0%	$27.33
Rhode Island	$17,936	1.9%	$16.96
Minnesota	$91,239	1.7%	$17.55
New York	$241,543	1.6%	$12.52
Iowa	$56,493	1.4%	$18.91
Massachusetts	$120,157	1.4%	$18.63
New Hampshire	$18,676	1.3%	$14.19
Idaho	$16,641	1.2%	$11.10
Wisconsin	$80,580	1.2%	$14.39
New Jersey	$95,914	1.1%	$11.04
Maine	$16,881	1.0%	$12.82
Texas	$79,500	0.9%	$3.33
Nevada	$28,270	0.8%	$11.02
Utah	$13,951	0.8%	$5.27
Hawaii	$16,556	0.7%	$12.90
South Dakota	$2,350	0.7%	$2.95
Montana	$6,659	0.5%	$6.95
Arizona	$31,900	0.5%	$5.03
Kentucky	$17,874	0.4%	$4.21
Florida	$92,564	0.4%	$5.07
Tennessee	$9,968	0.4%	$1.62
Colorado	$15,288	0.4%	$3.14
Ohio	$28,757	0.2%	$2.51
North Dakota	$668	0.2%	$1.04
South Carolina	$8,927	0.2%	$2.03
Kansas	$6,783	0.2%	$2.44
New Mexico	$2,957	0.2%	$1.50
North Carolina	$6,775	0.1%	$0.75
Maryland	$2,523	0.1%	$0.45
Indiana	$4,035	0.1%	$0.64
Nebraska	$948	0.1%	$0.53
Georgia	$4,819	0.0%	$0.50
Alaska	$298	0.0%	$0.44
Alabama	$2,287	0.0%	$0.49
Arkansas	$1,565	0.0%	$0.55
Pennsylvania	$4,069	0.0%	$0.33
Missouri	$1,318	0.0%	$0.22
Delaware	$208	0.0%	$0.24

State	2007 Total Spending* ('$1000)	Spending as Percent Revenues	Spending per Capita
Mississippi	$307	0.0%	$0.11
Illinois	$829	0.0%	$0.06
Oklahoma	$173	0.0%	$0.05
Virginia	$1	0.0%	$0.00
Wyoming	$0	0.0%	$0.00
Louisiana	$0	0.0%	$0.00
District of Columbia	$0	0.0%	$0.00
Michigan	$0	0.0%	$0.00
West Virginia	$0	0.0%	$0.00
U.S. Total	$2,219,658	0.8%	$7.36

*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 separately funded low-income programs, load management programs, or energy efficiency research and development.

APPENDIX B. TRANSPORTATION POLICIES

State Public Transportation Expenditures per Capita

State	FY 2006 Funding	Total Population	FY 2006 Per Capita Expenditure	Rank
Massachusetts	$1,217,790,879	6,434,389	$189.26	1
Maryland	$811,485,000	5,602,017	$144.86	2
New York	$2,573,088,000	19,281,988	$133.45	3
Alaska	$80,830,400	677,450	$119.32	4
New Jersey	$847,052,000	8,666,075	$97.74	5
Delaware	$67,180,200	852,747	$78.78	6
Pennsylvania	$822,826,000	12,402,817	$66.34	7
Connecticut	$225,605,428	3,495,753	$64.54	8
California	$2,208,814,477	36,249,871	$60.93	9
District of Columbia	$212,146,507	3,500,000	$60.61	10
Minnesota	$295,853,000	5,154,586	$57.40	11
Rhode Island	$47,182,752	1,061,641	$44.44	12
Illinois	$489,200,000	12,777,042	$38.29	13
Virginia	$267,556,000	7,640,249	$35.02	14
Wisconsin	$113,411,541	5,572,660	$20.35	15
Michigan	$200,984,058	10,102,322	$19.89	16
New Mexico	$35,650,000	1,942,302	$18.35	17
Florida	$176,391,501	18,057,508	$9.77	18
Oregon	$35,983,883	3,691,084	$9.75	19
Vermont	$5,746,599	620,778	$9.26	20
North Carolina	$66,466,447	8,869,442	$7.49	21
Indiana	$40,214,028	6,302,646	$6.38	22
Tennessee	$38,050,000	6,074,913	$6.26	23
Washington	$39,338,803	6,374,910	$6.17	24
Wyoming	$2,388,281	512,757	$4.66	25
Colorado	$21,800,000	4,766,248	$4.57	26
Iowa	$10,842,863	2,972,566	$3.65	27
North Dakota	$2,203,657	637,460	$3.46	28
Arizona	$18,042,000	6,165,689	$2.93	29
Kansas	$6,000,000	2,755,817	$2.18	30
South Carolina	$7,400,004	4,330,108	$1.71	31
Ohio	$16,300,000	11,463,513	$1.42	32
West Virginia	$2,258,342	1,808,699	$1.25	33
Texas	$28,741,067	23,407,629	$1.23	34
Louisiana	$4,962,500	4,243,288	$1.17	35
Arkansas	$3,277,637	2,809,111	$1.17	35

State	FY 2006 Funding	Total Population	FY 2006 Per Capita Expenditure	Rank
Missouri	$6,800,000	5,837,639	$1.16	37
South Dakota	$750,000	788,467	$0.95	38
Oklahoma	$3,250,000	3,577,536	$0.91	39
Nebraska	$1,500,000	1,763,765	$0.85	40
Montana	$740,891	946,795	$0.78	41
Mississippi	$1,600,000	2,899,112	$0.55	42
Georgia	$4,695,983	9,342,080	$0.50	43
New Hampshire	$588,000	1,311,821	$0.45	44
Kentucky	$1,700,000	4,204,444	$0.40	45
Maine	$505,000	1,314,910	$0.38	46
Idaho	$312,000	1,463,878	$0.21	47
Nevada	$92,000	2,492,427	$0.04	48
Alabama	$0	4,590,240	$0.00	49
Hawaii	$0	1,278,635	$0.00	49
Utah	$0	2,579,535	$0.00	49

Source: AASHTO (2008)
Population figures from Census (2007 estimates)