Meeting Aggressive New State Goals for Utility-Sector Energy Efficiency: Examining Key Factors Associated with High Savings

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EXECUTIVE SUMMARY

Background

The role of utility-sector[1] energy efficiency has undergone a dramatic transformation. In just the last few years, energy efficiency has evolved from being largely a token gesture or a "public benefits" set-aside, to being a top-priority utility system resource. Indeed, several states have established state policies which mandate that energy efficiency is "first" in the "loading order" of utility resources, and/or that their states should capture all cost-effective energy efficiency.

The causes of this profound increase in prominence are painfully familiar to those associated with electric utility industry. They include: (1) dramatic increases and great volatility in the prices of all fuels; (2) large and unprecedented increases in the costs of constructing new power plants; (3) shrinking reserve margins leading to concerns about electric system reliability in many regions; (4) growing concerns about the ability to finance and secure cost-recovery for large electric generation construction projects; and (5) mounting concerns about global warming and the realization that some type of monetization of carbon costs is probably inevitable. Together these factors have helped elevate energy efficiency to the status of an essential core utility system resource.

For all of the above reasons, states have been rushing to establish aggressive new energy savings goals for utility-sector energy efficiency programs. In just the last two years, Minnesota has passed legislation requiring energy efficiency savings equivalent to 1.5% of total sales each year; Illinois and Ohio have passed legislation requiring a ramp-up to 2% per year in the next decade; New York and Maryland are discussing policies that would require over 2% per year by 2015; and Vermont is heading toward a commitment of over 2% per year in the next few years. A number of other states are discussing goals in the 1% to 2% range or more. To put this in context, in our last comprehensive review (Kushler, York & Witte 2004), the very few top performing states in the nation were only achieving savings in the area of 0.8% per year.

Not surprisingly, the gap between past experience and the new policy requirements has led to questions such as: "Are these goals reasonable?" and "How are we going to accomplish this?" Broadly stated, the purpose of this study is to gather information to help address those questions.

More specifically, this project has two basic objectives: First, to identify the historical top-performing states in terms of utility-sector energy efficiency programs (e.g., using such indicators as energy efficiency savings as a percentage of total sales) and seek to identify factors that have contributed to their high level of performance; and second, to identify factors that may enable significant increases in those top levels of performance, both by examining states currently engaged in preparing for such increases and by consulting with leading industry experts.

Results

Through expert review and analysis of available quantitative data, this project identified a list of 14 "top states" in terms of electric utility-sector energy efficiency performance. In order of rankings by a panel of industry experts, those states were: California, Massachusetts, Connecticut, Vermont, Wisconsin, New York, Oregon, Minnesota, New Jersey, Washington, Texas, Iowa, Rhode Island, and Nevada.

Once we identified this pool of top states, we gathered and analyzed considerable additional information in order to attempt to identify key factors associated with high energy efficiency savings performance.

[1] As used in this report, "utility-sector" is intended to encompass all energy efficiency programs that are paid for through utility customer rates or other charges on utility bills. This would include programs administered by utilities as well as programs where the utilities merely collect the revenue and transfer it to other energy efficiency program administrators (e.g., government agencies or other third parties).

Energy Efficiency Spending and Savings

In this report we present data for these top 14 states on electric utility-sector energy efficiency spending and savings for 2006 and 2007, including the calculation of several performance benchmarks (i.e., energy efficiency spending as a percent of revenues, energy efficiency spending per capita, and energy efficiency savings as a percent of sales). Where available, we also present some disaggregated data on energy efficiency spending and savings by sector, and by major end-use categories.

Some noteworthy findings include the fact that energy efficiency spending was relatively balanced between the residential and non-residential sectors (median across the states of 44% and 56% respectively), but that savings were relatively skewed toward the non-residential sector (63% non-residential). Also striking was the extent to which the lighting end use dominated the savings accomplishments, accounting for nearly two-thirds of all savings in the states which had disaggregated data available. In the residential sector alone, lighting accounted for between 63% and 92% of reported savings.

Policy Factors

This project also reviewed the utility-sector energy efficiency policy framework in each of the 14 top states, including: administrative approach; type of cost recovery mechanism; whether there is a decoupling mechanism and/or shareholder incentive mechanism; and whether there is an Energy Efficiency Resource Standard (EERS) requirement. Those results are presented in Table 7 of the report, along with a discussion of patterns observed.

Expert Ratings

The project took advantage of the extensive experience of our panel of industry experts to ask them to rate the relative importance of a total of 16 key factors relating to the regulatory, economic and policy conditions within a state, in terms of how important each factor is "in enabling a state to achieve large utility-sector energy efficiency program savings results". We also asked them to rate each factor in terms of its "importance up until now" as well as its "likely importance in achieving future higher goals". A number of interesting results from these ratings are discussed in the report.

Recommendations from the States

As a fourth category of information, we sought to gather feedback directly from key representatives in each of the targeted states. Through telephone interviews we asked them for their thoughts on key factors contributing to strong energy efficiency accomplishments in their states, including both program-related factors and policy-related factors. Those results are presented in the body of the report, using their verbatim comments.

State Profiles

Finally, through interviews and document review we produced brief "summary profiles" of several of the leading states that have recently been engaged in efforts to increase their utility-sector energy efficiency goals. That information is provided in Appendix C.

Conclusions

The following are some of our highlight observations from this project.

- A number of states are achieving very significant levels of utility-sector energy efficiency savings, and these savings levels show increases over what was being achieved earlier in this decade.

- However, with one exception (Vermont), no states are yet reporting energy efficiency savings at the higher levels being called for in a number of recent state policy decisions (i.e., in the range of 1.5% to 2.0% per year or more).

- A number of key factors are associated with high levels of utility-sector energy efficiency achievements, including having relatively high levels of funding for energy efficiency programs and having strong legislative and regulatory requirements and support for energy efficiency.

- In meeting future, higher, energy efficiency savings requirements, key additional factors identified by industry experts include: having appropriate incentives for utilities to pursue energy efficiency (including both shareholder incentives and decoupling) and securing the commitment of top utility management; having high quality energy efficiency programs; and appropriately recognizing the cost of carbon emissions.

- Other issues such as who administers the energy efficiency programs (utilities or state government or independent 3rd parties); or whether a state is "restructured"; or particular demographics or climate; are not regarded as particularly important factors in whether or not a state can achieve high levels of energy efficiency achievements.

- To date, utility-sector energy efficiency savings achievements have been heavily dominated by savings in the "lighting" area, and there is a widely-acknowledged need to increase savings in other end-use and program areas.

- The major increases in utility "supply side" costs (e.g., fuel costs and power plant construction costs) that have occurred in the last few years should allow for program portfolios to more aggressively pursue energy efficiency savings in "non-lighting" areas and still be cost-effective. This will likely include raising energy efficiency incentives to customers.

- A number of leading states have recently announced goals to dramatically increase utility-sector energy efficiency savings, and are taking concrete actions to implement those policies. Several state examples are described in Appendix C.

INTRODUCTION

Background

There have been energy efficiency programs of some type operated in the U.S. since the late 1970s. The focus and magnitude of these efforts has fluctuated over that time period, depending upon various economic and political factors at play at any given point in time and in any given jurisdiction. Overall, a number of reviews have judged these utility-sector energy efficiency efforts to be generally quite cost-effective (e.g., Cowart 2001; Kushler, York & Witte 2004; U.S. DOE & U.S. EPA 2006).

However, for most of that time, and in most jurisdictions, energy efficiency has been regarded as a fairly minor component of overall utility resource portfolios—more of a symbolic placeholder than a core component of the utility system.

A New Urgency

In just the last few years, that historical view of utility-sector energy efficiency has changed substantially. Energy efficiency has evolved from being largely a token gesture or a "public benefit" set-aside, to a front-line utility system resource. Indeed in several jurisdictions it is now state policy that energy efficiency is "first" in the "loading order" of resources that the utility system shall pursue.

This rapid and striking evolution has been precipitated by a virtual "perfect storm" of circumstances that have combined to elevate the importance of energy efficiency. These include: (1) dramatic increases and great volatility in the prices of all fuels; (2) large and unprecedented increases in the costs of constructing new power plants; (3) shrinking reserve margins leading to concerns about electric system reliability in many regions; (4) growing concerns about the ability to finance and secure cost-recovery for large electric generation construction projects; and (5) mounting concerns about global warming and the realization that some type of monetization of carbon costs is probably inevitable. Together these factors have helped elevate energy efficiency to the status of an essential core utility system resource.

Aggressive New State Energy Efficiency Goals

For all of the above reasons, states have been rushing to establish aggressive new energy savings goals for utility-sector energy efficiency programs. In just the last two years, Minnesota has passed legislation requiring energy efficiency savings equivalent to 1.5% of total sales each year; Illinois and Ohio have passed legislation requiring a ramp-up to 2% per year in the next decade; New York and Maryland are discussing policies that would require over 2% per year by 2015; and Vermont is heading toward a commitment of over 2% per year in the next few years. A number of other states are discussing goals in the 1% to 2% range or more. To put this in context, in our last comprehensive review (Kushler, York & Witte 2004), the very few top performing states in the nation were only achieving savings in the area of 0.8% per year.

Purpose of this Study

Given this rapidly spreading trend toward policy directives to achieve energy savings at levels that are unprecedented, the question naturally arises among states, utilities, and others responsible for energy efficiency program administration: "How are we going to accomplish this?" In the broadest sense, the purpose of this study is to provide practical information that can help address that question.

More specifically, this project has two basic objectives: First, to identify the historical top-performing states in terms of utility-sector energy efficiency programs (e.g., using such indicators as energy efficiency savings as a percentage of total sales) and seek to identify factors that have contributed to their high level of performance; and second, to identify factors that may enable significant increases in those top levels of performance, both by examining states currently engaged in preparing for such

increases and by consulting with leading industry experts. We present our methodology for this research in the next section, followed by an extensive section detailing the results of our research, and then a brief section presenting our conclusions at the end of this report.

METHODOLOGY

For this project, we employed a wide variety of data collection methodologies, including: direct surveys and data collection from leading states; review of recent industry literature, including reports and conference papers; soliciting information from a panel of prominent experts within the industry[2]; and review of our own extensive files and databases on utility-sector energy efficiency policies and programs.

We began by seeking to identify what could be considered the "top tier" of states in terms of historical and current utility-sector energy efficiency accomplishments, so that we could focus our efforts at understanding what factors contribute to high levels of energy efficiency savings. To accomplish that objective, we relied upon two methods: (1) we asked our panel of experts to identify their "top ten" states in terms of utility-sector energy efficiency; and (2) we gathered data on actual reported energy efficiency program spending (i.e., energy efficiency spending as a percentage of total utility sales revenues and energy efficiency spending per capita) and savings (i.e., energy efficiency program savings as a percentage of total electricity sales) in each state.[3]

As we completed this initial data collection process, it became evident that there was much less policy and program activity, and much less data available, regarding natural gas utility energy efficiency spending and savings. As a result, we necessarily focused our second stage data collection and analysis primarily on electric utility energy efficiency policies and programs.[4]

After identifying a top tier of states, we engaged in detailed data collection on each state, including extensive document reviews and interviews with key representatives such as staff at the state regulatory commission. The core objective here was to discover factors that have contributed to the strong energy efficiency accomplishments in each state, and to identify current plans and activities to increase energy efficiency achievements.

Finally, we used the full range of methodologies (i.e., our expert panel, review of recent literature, review of our own files, and direct interviews and data collection from the states) to examine the issue of what factors will likely be most important on a going-forward basis to enable states and utilities to meet the new aggressive energy savings targets that are being established.

RESULTS

Top States for Electric Utility-Sector Energy Efficiency Programs

We began this component of our effort by asking our panel of national experts for their listing of the "top ten" states in the nation in terms of electric utility-sector energy efficiency.[5] The results of these expert ratings are presented in Table 1. The states are rank ordered by the median rank they received from the experts. The table also shows the number of our expert raters that included each state in their "top ten".

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[2] For this project we recruited a panel of nine prominent national experts with extensive experience in the field of utility-sector energy efficiency programs and policies. This included individuals with experience in research and program evaluation as well as program design and administration. The complete list of names and affiliations is presented in Appendix A.

[3] These relatively simple-sounding metrics actually require a great amount of effort to compute, involving the acquisition and analysis of U.S. Energy Information Administration data as well as direct data collection from state agencies, utilities, and independent program administrators.

[4] We intend to address the issue of natural gas utility energy efficiency in a subsequent report.

[5] We also asked for the top ten states in terms of natural gas energy efficiency. The natural gas results are presented in Appendix B.

Table 1: Experts' Rankings of States on Electric Utility-Sector Energy Efficiency

State	Median Rank by Expert Panelist	Number of Times State Was Selected by Expert Panelist as One of Top Ten Leading EE States
California	1	9
Massachusetts	3	9
Connecticut	3	7
Vermont	4	9
Wisconsin	6	8
New York	6	8
Oregon	7	9
Minnesota	7	6
New Jersey	9	7
Washington	9	6
Texas	11	5
Iowa	11	3
Rhode Island	13	2
Nevada	14	1

Overall, the results demonstrate a fairly high degree of consistency among the experts, with nearly all raters including the top 7 or 8 states on their lists, and only 14 states being listed at all. This amount of convergence among our experts suggests that it is possible to identify a pool of the "leading states" in terms of electric utility-sector energy efficiency.

Concurrently with our experts' nominations of top tier states, we also gathered data on actual reported energy savings results across all states. For that variable, we used a metric consisting of annual electric energy efficiency program savings (in MWh), divided by total electric retail sales (in MWh). We also computed several other indicators of relative energy efficiency program effort and achievement, including total energy efficiency program spending as a percent of total utility revenues and total energy efficiency program spending per capita for each state. These results are presented in Table 2.

Several aspects of the results in Table 2 are worthy of note. First, it is interesting to observe that the experts' rankings of the top states do not necessarily conform directly to any of the three primary quantitative indicators of energy efficiency activity (i.e., spending as a percent of revenues; spending per capita; savings as a percent of total sales). This lack of a strong correlation is visually illustrated in Figures 1 through 3.

The most likely explanation for this relative lack of correlation between state ranking and the specific spending/savings data is that factors beyond just numerical output influence perceptions of what constitutes a "leading state", including elements such as the presence or absence of key state policies. Some of these factors will be discussed in later sections.

Table 2: Electric Energy Efficiency Program Savings and Spending Data for Leading States

State	Median rank by expert panel	Number of times selected	Rank with tie-breakers used	Average rate to retail customers 2007 data from EIA Cents/kWh	EE spending: total (includes utility and non-utility public benefit programs) $000s		Total EE spending as % total revenues for all utilities (IOUs and POUs) %		EE spending per capita $/capita		EE annual savings -- statewide total -- EIA plus non-utility data (or other data source) MWh		EE annual savings — statewide as % of total state kWh sales %	
					2006	2007	2006	2007	2006	2007	2006	2007	2006	2007
California	1	9	1	12.3	$357,000	$645,800	1.1%	1.9%	$9.85	$17.64	1,912,000	2,275,000	0.7%	0.9%
Massachusetts	3	9	2	14.6	$125,000	$120,157	1.5%	1.4%	$19.43	$18.49	455,000	489,622	0.8%	0.9%
Connecticut	3	7	3	16.0	$70,999	$98,230	1.5%	2.1%	$20.31	$28.05	328,000	355,000	1.2%	1.3%
Vermont	4	9	4	12.2	$15,806	$23,690	2.4%	3.5%	$25.46	$37.78	62,872	105,243	1.1%	1.8%
Wisconsin	6	8	5	8.4	$77,683	$80,580	1.4%	1.4%	$13.94	$14.32	451,192	467,725	0.6%	0.7%
New York	6	8	6	14.7	$223,863	$241,543	1.0%	1.1%	$11.61	$12.40	823,837	NA	0.6%	NA
Oregon	7	9	7	7.3	$63,318	$69,107	2.0%	2.2%	$17.15	$18.54	369,827	437,494	0.8%	0.9%
Minnesota	7	6	8	7.1	$82,245	$91,239	1.8%	1.9%	$15.96	$17.53	411,999	463,543	0.6%	0.7%
New Jersey	9	7	9	12.4	$83,177	$95,914	0.9%	1.0%	$9.60	$10.96	227,764	242,270	0.3%	0.3%
Washington	9	6	10	6.6	$113,288	$126,678	2.2%	2.4%	$17.77	$19.67	630,691	635,062	0.7%	0.7%
Texas	11	5	11	9.7	$57,800	$79,500	0.2%	0.2%	$2.47	$3.36	397,305	457,808	0.1%	0.1%
Iowa	11	3	12	6.3	$55,296	$56,493	1.8%	1.8%	$18.60	$18.82	315,255	322,177	0.7%	0.7%
Rhode Island		2	13	13.5	$17,178	$17,400	1.6%	1.6%	$16.18	$16.23	96,048	64,995	1.2%	0.8%
Nevada		1	14	9.4	$24,000	$28,700	0.7%	0.8%	$9.63	$11.40	216,000	206,000	0.6%	0.6%
Median					$74,341	$85,910	1.5%	1.7%	$16.07	$17.58	383,566	437,494	0.7%	0.7%
Mean					$97,618	$126,788	1.4%	1.7%	$14.85	$17.51	478,414	501,688	0.7%	0.8%

Note: Energy efficiency spending and savings estimates are based on the best available data from applicable state agencies in each state.

Figure 1: Expert Rankings vs EE Spending as % Revenues

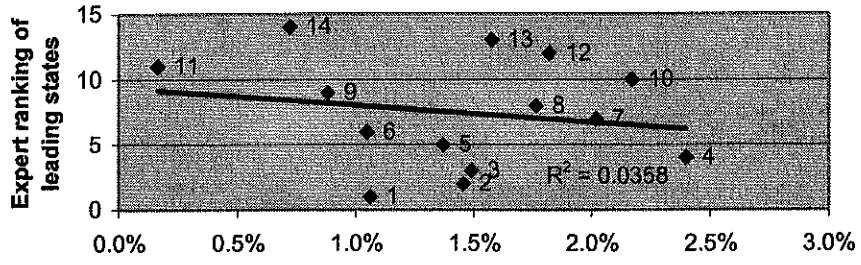


Figure 2: Expert Rankings vs EE Spending Per Capita

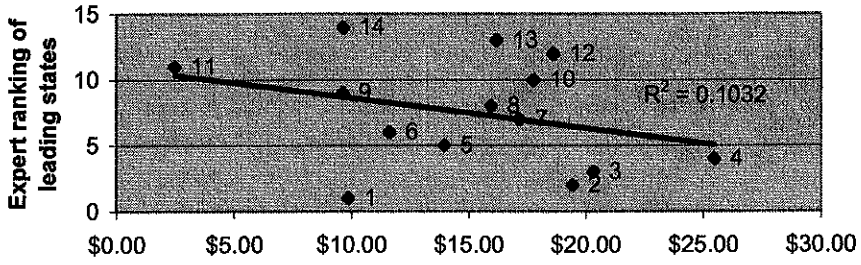
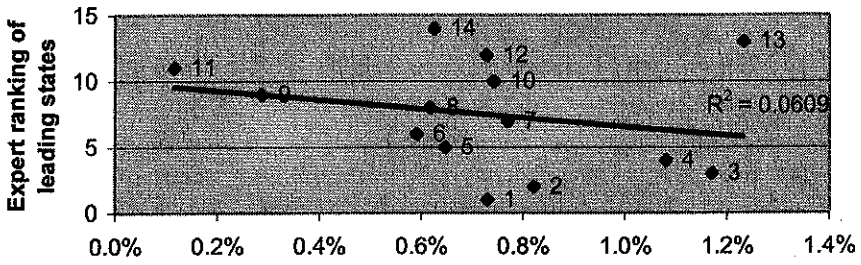


Figure 3: Expert Rankings vs EE Savings as % Energy Sales



On the other hand, it is clearly the case that the experts did select most of the top performing states in the nation in terms of these quantitative indicators. For example, the states in Table 2 include the top

eight states in the nation in terms of energy efficiency savings as a percentage of electricity sales, and 12 of the top 16 states.[6] The only top 16 states not included in the experts' lists are very small states (New Hampshire, Idaho, Hawaii, and Maine) with very small energy efficiency programs in absolute terms. Conversely, only two of the experts' selected states were not in the top 16 on that energy savings indicator. These were New Jersey (19th) and Texas (roughly tied for 21st), which are very large states with some unique policy approaches that help make them noteworthy. Overall, we decided to go with the list of 14 states nominated by our expert panel, as a good representation of "leading states" in terms of utility-sector energy efficiency programs.

Another interesting result from Table 2 is that the data confirm the general perception that utility-sector energy efficiency efforts are growing. Across each indicator, for nearly all of these states, energy efficiency spending and savings increased from 2006 to 2007.

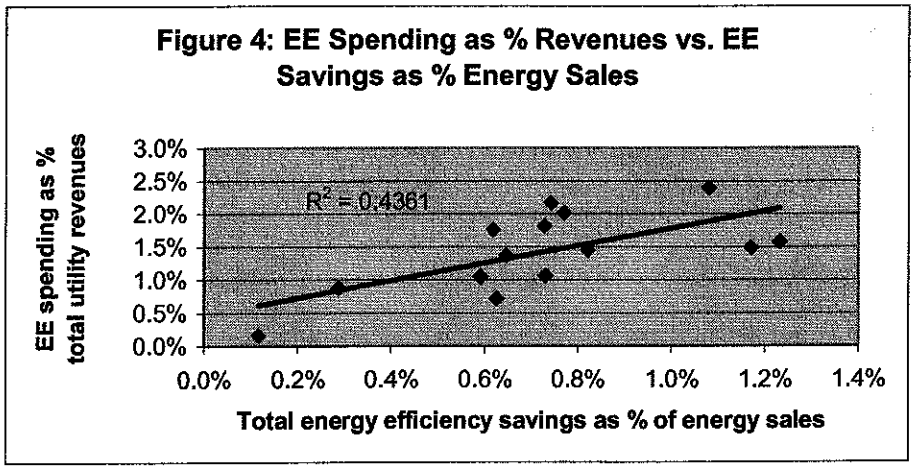
Finally, however, it is worth noting that with one very recent exception (Vermont), none of these "top states" are really yet near the level of energy efficiency savings (i.e., 1.5% to 2.0% or more) that will eventually be required under recent policies established in several states. The good news is that the trend in the magnitude of savings is up, and that a number of states now exceed the 0.8% savings level that had been the ceiling in our 2004 research. But clearly, substantial additional increases are still needed.

Relationship of Energy Efficiency Spending with Energy Efficiency Performance

Having identified a good set of "top states" in terms of electric utility-sector energy efficiency programs, we then sought to identify key factors that appear to be associated with high performance. The first area examined was the level and distribution of energy efficiency program spending.

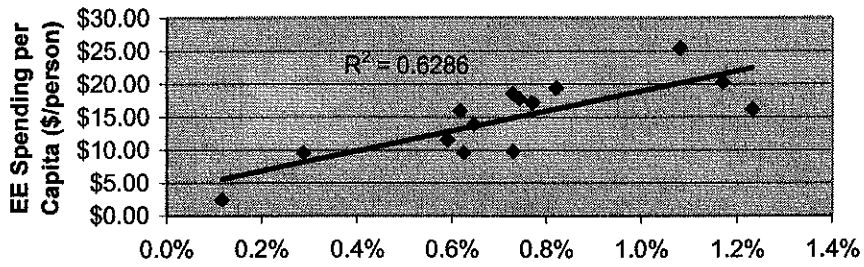
Energy Efficiency Spending Level

On one hand, it seems intuitive that greater levels of spending on energy efficiency programs would produce greater relative energy savings. On the other hand, there is a prevalent cultural counter-argument that one cannot simply "throw money at a problem," and that big budgets alone aren't sufficient to accomplish one's objectives. Fortunately, in this case we have some actual data to bring to bear on this subject. Figures 4 and 5 illustrate the relationship of energy efficiency spending as a percent of revenues (Figure 4), and energy efficiency spending per capita (Figure 5), with energy savings as a percent of total utility retail sales, across these 14 leading states.



[6] See the recent ACEEE report: *The 2008 State Energy Efficiency Scorecard* (Eldridge et. al. 2008) for complete data on all 50 states.

Figure 5: EE Spending per capita vs EE Savings as % Energy Sales



As the figures illustrate, there is actually a very strong correlation between the relative level of energy efficiency spending (both as a percent of utility revenues and per capita) and energy savings results, among these 14 "top states." The relationship is obviously not a perfect one. There are some states that spend proportionately a little less and save proportionately a little more (and vice versa), and we will attempt to examine some of the other factors contributing to energy efficiency success in this report. But it would seem clear from these results that one important conclusion is: if a state wants to "talk the talk" of setting high energy savings goals, they will need to "walk the walk" in terms of providing sufficiently high levels of funding for energy efficiency programs.[7]

Energy Efficiency Spending and Savings by Sector

In addition to the total amount of spending for energy efficiency programs, it may also be useful to examine where that spending is directed. For example, there is a general perception within the industry that the commercial and industrial sectors tend to have larger and more cost-effective energy efficiency opportunities than the residential sector, and historical evaluation results have tended to reflect that differential (e.g., Kushler, York and Witte 2004). At the same time, most states tend to have policies that support the notion of fair treatment among ratepayer sectors, such that all customer classes are adequately served. In investigating the factors contributing to high state performance regarding energy efficiency achievements, it would be interesting to see if there were any distinctions in terms of relative emphasis on the residential vs. commercial and industrial classes.

To examine this issue, we took a look at relative energy efficiency spending and savings by customer sector (i.e., residential vs. commercial/industrial) to see if there were any noteworthy patterns. We were not able to obtain this disaggregated data for all the states in our list, but Table 3 summarizes the data we were able to obtain.

The data in Table 3 reveal several interesting results. First, it is noteworthy that across these leading states, there is substantial variation in terms of the allocation of funding to programs in the residential vs. non-residential sectors. For example, the allocation to the residential sector ranges from as low as 29% to as high as 64%. Overall the distribution shows slightly more funding provided to the non-residential sector, as indicated by both the mean and median values (54% and 56% respectively).

[7] Indeed, that was one of our core conclusions in a 2003 report (Kushler & Vine 2003), which analyzed what is generally regarded as the single largest energy savings accomplishment in U.S. history. In response to its electricity crisis during that period, California nearly tripled its utility-sector energy efficiency funding (to over $900 million, more than the rest of the U.S. combined). As a result of that and other coordinated efforts, California achieved a phenomenal one-year 6.7 percent reduction in total electricity use and a 10 percent cut in peak demand, thereby completely avoiding the additional rolling blackouts that had been predicted for the state.

The results for energy savings show a similar variability (e.g., the residential savings proportion ranges from 24% to 76%). However, the overall allocation tilts even more toward a greater proportion of savings coming from the non-residential sector, with a mean of 60% and a median value reaching 63%.

In Table 4 we examine the relative contributions to savings from the two sectors a little more directly.

Table 3. Electric Energy Efficiency Spending and Savings by Sector

State	Program	Expenditures			Savings	
		Res.	Non-Res.		Res.	Non-Res.
Connecticut		29%	71%	2007	34%	66%
Vermont	Efficiency Vermont	49%	51%	2007	60%	40%
Wisconsin	Focus on Energy: 2nd half FY07	39%	61%	2007	36%	64%
	Focus on Energy: Cumulative program 2001-2007	45%	55%	2007	42%	58%
New York	NYSERDA	50%	50%	2007	25%	75%
Northwest Region	Regional data—WA, OR, ID and western MT	40%	60%	2007	36%	64%
New Jersey		64%	36%	2007	62%	38%
Texas		64%	36%	2007	43%	57%
Iowa		43%	57%	2006	24%	76%
Rhode Island		38%	62%	2007	38%	62%
	Max	64%	71%		62%	76%
	Min	29%	36%		24%	38%
	Median	44%	56%		37%	63%
	Mean	46%	54%		40%	60%

Table 4. Percentage Savings/Percentage Spending

		Res.	C/I
Connecticut		116%	94%
Vermont	Efficiency Vermont	122%	79%
Wisconsin	Focus on Energy: 2nd half FY07	93%	105%
	Focus on Energy: Cumulative program 2001-2007	93%	105%
New York	NYSERDA	51%	149%
Northwest Region	Regional data—WA, OR, ID and western MT	88%	108%
New Jersey		97%	106%
Texas		67%	158%
Iowa		56%	133%
Rhode Island		98%	101%
	Max	122%	158%
	Min	51%	79%
	Median	93%	106%
	Mean	88%	114%

The data in Table 4 tend to confirm the general perception mentioned earlier: that the non-residential sector has relatively more cost-effective energy efficiency opportunities. All but two of the states/regions show that the share of savings achieved in the non-residential sector exceeded the share of spending directed to that sector (i.e., a value in excess of 100% means that the ratio of savings to spending exceeded 1.0). The one notable "outlier" state is Vermont (with the non-residential figure being only 79%), which anecdotally appears to be in part due to the fact that Vermont has successfully implemented one of the most aggressive and effective residential CFL programs in the nation.

Energy Efficiency Savings by Program/End-Use

At a further level of detail, it may also be useful to examine the amount of electric savings being achieved by the type of program or end-use. For this issue, we were only able to obtain data at a sufficient level of detail from a limited number of states. That data is provided in Table 5.

Table 5. Electricity Savings by Program and/or Principal End-Use Technologies
Top Three End-Use Savings Categories

State	Program	End-Use Category	Percentage savings of sector	Percentage savings of total--all sectors
California				
	Southern California Edison			
		Residential:		
		Lighting	76.9%	35.5%
		Refrigeration	19.6%	9.1%
		HVAC	2.7%	1.3%
		Comm/Industrial		
		Lighting	61.3%	27.9%
		Process	17.9%	8.1%
		Other	12.6%	5.7%
		All: Lighting		63.4%
	Pacific Gas & Electric			
		Residential:		
		Lighting	92.0%	36.6%
		Refrigeration	5.3%	2.1%
		Appliances	1.6%	0.6%
		Comm/Industrial		
		Lighting	69.3%	35.9%
		Process	12.7%	6.6%
		Refrigeration	8.9%	4.6%
		All: Lighting		72.5%
Rhode Island				
	Narragansett Electric Company - National Grid			
		Residential:		
		Lighting	73.1%	27.5%
		Other end-use differentiation not available		
Vermont				
	Efficiency Vermont			
		Residential:		
		Lighting	89.3%	53.1%
		Hot water fuel switching	2.5%	1.5%
		Space heating fuel switching	2.1%	1.3%
		Commercial/Industrial		
		Lighting	59.5%	24.1%
		Industrial process eff	14.5%	5.9%
		Motors	7.3%	2.9%
		All Services		
		Lighting		77.2%
		Industrial process eff		5.9%
		Motors		3.4%

State	Program	End-Use Category	Percentage savings of sector	Percentage savings of total--all sectors
New Jersey				
	New Jersey Clean Energy Program			
		Residential:		
		Lighting	82.6%	51.4%
		HVAC	8.8%	5.5%
		New Homes	3.9%	2.4%
		Commercial/Industrial		
		Differentiation by end-uses not available		
Wisconsin				
	Focus on Energy			
		Residential:		
		Lighting	62.5%	25.6%
		ECM furnace (fans)	9.4%	3.8%
		Refrigeration	5.2%	2.1%
		Commercial/Industrial		
		Lighting	54.8%	37.2%
		Compressed air	9.3%	6.3%
		HVAC	8.4%	5.7%
		All: Lighting		62.8%

In examining the data in Table 5, one striking result stands out: overall energy efficiency savings are heavily dominated by the "lighting" end-use. This is true for both the residential and C&I sectors, although much more so for the residential sector. (Across these example states, lighting accounts for between 63% and 92% of all reported residential savings, vs. 55% to 69% of all reported C&I savings.)

Refrigeration and HVAC are the other notable residential end-use savings contributors, while industrial process efficiency, compressed air, motors and refrigeration are the other major contributors in the C&I sector.

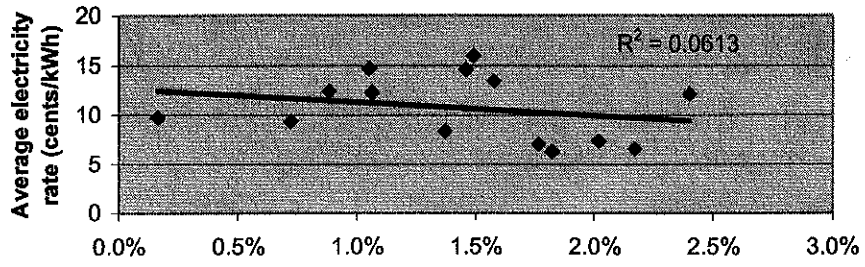
These findings reinforce a commonly-heard lament in the industry that energy efficiency portfolios must increase their focus and achievements in non-lighting areas. This will become a critically important factor in the residential sector as the new federal lighting standards come into effect in 2012.

Effect of Electricity Prices

In contemplating the relative success among states in utility-sector energy efficiency, one variable that is sometimes mentioned as a possible intervening factor is the relative electricity price that consumers face (e.g., higher electricity prices would presumably increase interest, and participation, in energy efficiency programs). While a thorough examination of this issue was beyond the scope of this study, we did take a brief look at the relationship of electricity prices (using an average statewide retail price derived from EIA data) to utility-sector energy efficiency spending and savings.

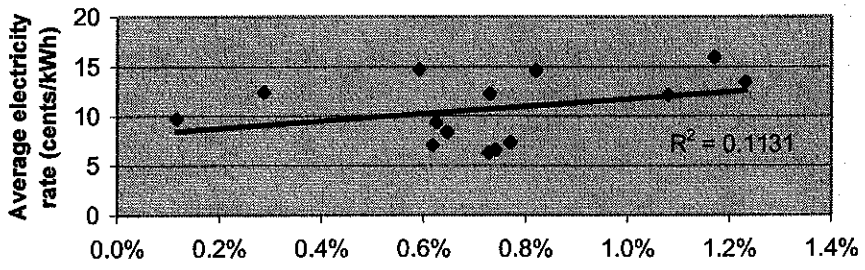
To begin, we examined the relationship between average retail rate in the state and the relative level of funding of utility-sector energy efficiency programs (in terms of energy efficiency spending as a percentage of revenues). As illustrated in Figure 6, there was little or no relationship between average electricity rate and the level of energy efficiency funding. Among this group of states at least, the level of electric rates does not appear to drive the relative level of utility-sector energy efficiency expenditures being required.

Figure 6: Average Electricity Rates vs EE Spending as % Revenues



We then took a look at the relationship between average retail rate and energy efficiency savings as a percentage of total sales. In Figure 7 on the next page, we do see a slight positive relationship between these two variables.

Figure 7: Average Electricity Rates vs EE Savings as % Energy Sales



The direction of relationship is intuitively logical (i.e., higher prices would be expected to help facilitate greater energy efficiency). But the magnitude of the relationship is slight, and dwarfed by the relationship between energy efficiency savings and the level of energy efficiency program spending per capita (R^2 = .63) presented earlier in Figure 5.

One practical implication of these results is that there is no support for the contention that energy efficiency programs should not be expected to produce strong energy efficiency savings results in relatively "low-cost" states (i.e., states with relatively low existing electric rates).[8] Clearly, in this group of states, similarly strong energy savings (in the range of 0.6% to 0.8% of sales) were produced in states with electricity rates that varied by more than a factor of two. On the other hand, it is true that the very highest savings levels thus far have been in a couple states with very high electric

[8] A second potential implication of this observation that electricity prices are not a dominant factor is that these results tend to provide additional support to the argument that simply raising electricity prices (e.g., through a carbon tax) is not likely to be sufficient, in and of itself, to produce desired energy efficiency gains. This would be consistent with voluminous research in this field documenting the many "market barriers" that impede customer action on energy efficiency improvements that would appear to be economically cost-effective (Blumstein et. al 1980; Golove & Eto 1996: U.S. DOE & U.S. EPA 2006).

rates, so it would be inappropriate to conclude that electricity prices play no role in contributing to energy efficiency impacts.

Expert Ratings of Key Factors Associated with Strong Energy Efficiency Performance

As another approach to seeking to identify important elements or conditions that may contribute to strong success with utility-sector energy efficiency programs, we asked our panel of industry experts to rate each of 16 key factors we identified, which based on our experience, could plausibly be expected to affect energy efficiency performance. We also asked our experts to consider two dimensions of this issue: (1) what has been the importance of each factor up until now; and (2) what is the likely importance of each factor in achieving future higher energy efficiency goals? The results of these expert ratings are presented in Table 6.

Important Factors Up Until Now

In rating the importance of factors affecting high performance in utility-sector energy efficiency performance thus far, elements reflecting strong state policy requirements and support rose to the top of the pack. The leading factor, given the top rating by a majority of our experts, was "the relative size of the energy efficiency program budget". Closely following were the factors: "Having a strong state legislative requirement for energy efficiency" and "Having a regulatory commission very supportive of energy efficiency".

The importance of having higher quality programs appeared in the next cluster, along with two factors relating to utility management motivation: "The personal commitment of utility top management", and "Having utility shareholder incentives for energy efficiency results". Interestingly, the importance of "having some penalty for poor performance" was rated much lower than having utility shareholder incentives (4.0 vs. 6.8).

It is also interesting to note that the structural environment within which the energy efficiency programs operate did not appear to be very important. The "Particular characteristics of state/service territory (e.g., demographics, economy, climate)"; whether a state is "restructured" or not, and who administers the energy efficiency programs, were all relatively low rated (ranging from 4.4 to 5.1). Even "the price of electricity (gas)" received only a moderate rating (5.6).

Perhaps not surprisingly, "the perceived cost of carbon" was the lowest ranked factor (3.4) in the rating of importance up until now.

Table 6. Experts' Ratings of Key Energy Efficiency Factors

Experts were asked "How important are each of the following factors in enabling a state to achieve large utility energy efficiency program savings results? [Please rate each factor on a 1-10 scale, with '10' being extremely crucial]."

Factor	Importance Up Until Now (Mean Rating of Raters)	Number of Raters Giving Highest Rating Level to This Variable	Likely Importance In Achieving Future Higher Goals (Mean Rating of Raters)	Number of Raters Giving Highest Rating Level to This Variable
The relative size of the EE program budget	8.8	Five	9.4	Four
Having a strong state legislative requirement for EE	8.3	Three	9.4	Six
Having a regulatory commission very supportive of EE	8.0	Three	8.5	Four
Having EE programs that are higher quality than typical industry practice	7.1	One	8.0	Three
Having utility shareholder incentives for EE results	6.8	One	8.3	Three
The personal commitment of utility top management	6.8	Four	8.9	Five
Increased experience and capability due to history of prior EE programs	6.4	One	7.7	One
How high the price of electricity (gas) is	5.6	None	6.8	None
Having decoupling in place	5.4	One	7.8	Three
Who administers the EE programs (utility vs. non utility)	5.1	None	5.1	None
Existing state building codes/ efficiency standards, which affect "baseline" conditions	4.9	None	5.9	None
Particular characteristics of state/service territory (e.g., demographics, economy, climate)	4.5	None	5.3	None
Whether a state is "restructured" or not	4.4	One	4.4	One
Having some penalty for poor utility EE performance	4.0	None	5.0	None
Diminished remaining potential due to history of prior EE programs	3.8	None	4.1	None
The perceived cost of carbon emissions	3.4	None	7.9	None

Likely Importance in Achieving Future Aggressive Energy Efficiency Goals

In general, the three key factors focusing on strong policy requirements (i.e., size of budget, having a strong legislative requirement, and very supportive regulatory commission) remained at the head of a list, although "The personal commitment of utility top management" did jump up into that top tier.

Moreover, the whole issue of utility motivation appears to be generally regarded as an increasingly important factor moving forward, as the ratings of both "Having utility shareholder incentives..." and "Having decoupling in place" each jumped substantially in the 'future importance' ratings. Given that increasingly large energy savings requirements would have increasingly large adverse financial impacts on utilities under traditional regulation, it's quite logical that these factors would be taking on a growing importance.

Another interesting result in the table relates to the old conundrum of whether having had energy efficiency programs in place for a long time is an advantage or a disadvantage in terms of facing aggressive new energy savings requirements. Does the advantage of experience and infrastructure outweigh the possible disadvantage of having harvested all the "low hanging fruit"? In the view of our experts, it appears that experience wins, as they rated "Increased experience and capability due to history of prior energy efficiency programs" a 7.7, more than twice the importance rating of "Diminished remaining potential due to history of prior energy efficiency programs" (3.8).

Finally, and not surprisingly, the factor with the single biggest jump in importance when looking to the future was "The perceived cost of carbon emissions", which more than doubled (3.4 to 7.9) in the rating of likely future importance.

State Policies Related to Utility-Sector Energy Efficiency

Another area of examination included in this study was to consider the degree and type of policy support for utility-sector energy efficiency in each of our 14 selected "leading states". We gathered information from the states concerning their status with respect to five key aspects of state energy efficiency policy:

1. The type of cost-recovery used for energy efficiency program funding
2. Whether there are 'shareholder incentives' for energy efficiency performance
3. Whether a 'decoupling' policy is in place
4. Who administers the programs
5. Whether there is an 'Energy Efficiency Resource Standard' (EERS) requirement

The results regarding these items are presented in Table 7.

Table 7: Summary of Policies Relative to Electric Utility-Sector Energy Efficiency

State	Median rank by expert panel	Number of times selected	2006 EE savings as % of total state kWh sales	Type of cost recovery	Shareholder incentives	Decoupling	Who administers programs	EERS requirement
CA	1	9	0.7%	Historically the programs have been funded with a non-by-passable public benefit charge embedded in the rates. Due to increased activity, CA has added procurement funds to supplement the funding.	Yes, utilities can earn a share of benefits	Yes, electric and gas decoupling	Utilities	The state set energy savings goals for IOUs for 2004-2013, which are expected to save about 1% of total forecast electricity sales per year.
MA	3	9	0.8%	A non by-passable per kWh public benefits wires charge.	Yes, cos can earn approximately 5% of program costs for meeting established program goals.	Historically no but, in Order D.P.U. 07-50A, the Commonwealth required each electric & gas co. to decouple distribution revenue recovery from sales. Companies must implement plans in compliance with the order by 2012.	Utilities and the Cape Light Compact Municipal Aggregator. DOER and DPU also provide admin functions.	MA passed legislation in July 2008 establishing a state goal of meeting 25% of load, both capacity and energy, by 2020, with EE, LM, DR and generation behind the customer's meter. The goal has not yet been translated into specific utility annual saving requirements.
CT	3	7	1.0%	Historically the CEEF has been funded through a non-bypassable system benefits charge of approximately 3 mills/kWh on customers' electric bills. Due to new initiatives, new funding sources are being tapped: the ISO-New England Forward Capacity Market (FCM) and the Regional Greenhouse Gas Initiative (RGGI).	Yes, bonus rate of return. Also, the CT DPUC has incentives of $25 per kilowatt-year for utility EE programs that reduce federally mandated congestion charges (FMCC).	Historically no but, per PA 07-242, the DPUC is required to decouple distribution revenue recovery from sales for each electric & gas co. in each company's next rate proceeding.	Utilities	Electricity suppliers must purchase 1% of supply from energy efficiency and CHP by 2007, and 4% by 2010 (i.e., the targets increase by 1% per year).

State	Median rank by expert panel	Number of times selected	2006 EE savings as % of total state kWh sales	Type of cost recovery	Shareholder incentives	Decoupling	Who administers programs	EERS requirement
VT	4	9	1.9%	A non by-passable energy efficiency charge that is included in the electric rates and assessed on customers' monthly electric bills	N/A for utilities but Vermont Energy Investment Corporation (VEIC) is eligible to receive a performance incentive for meeting goals established in its contracts.	Partial. Approved for Green Mountain Power only.	Vermont's Energy Efficiency Utility, Efficiency Vermont, which is run by contractor VEIC	The Vermont Public Service Board (PSB) has established a performance-based contract with VEIC that includes specific energy (kWh) and peak demand (kW) savings targets.
WI	6	8	0.5%	Cost recovery for utility energy efficiency programs is handled through individual rate cases.	Has been N/A due to non-utility administration. Utilities can propose incentives as part of their rate cases for extra EE.	Historically no, but docket open. One utility settlement approved.	The PSCW administers the statewide public benefits program called Focus on Energy. PSCW contracts with nonprofit, Wisconsin-based organizations to implement the programs. Presently exploring appropriate savings targets and how to achieve them; some utilities offer selected programs in addition to the state-wide program.	None

State	Median rank by expert panel	Number of times selected	2006 EE savings as % of total state kWh sales	Type of cost recovery	Shareholder incentives	Decoupling	Who administers programs	EERS requirement
NY	6	8	0.6%	The New York Energy $mart programs are funded by a monthly charge (system benefits charge) on customers' electric bills. The charge, based on the utility's sales, averages approximately 1.7 mills/kWh.	Has been N/A due to non-utility administration.	Historically no but, per Case 03-E-0640/Case 06-G-0746, the electric and gas utilities are required to propose revenue decoupling proposals in their next rate proceeding.	ConEd administers programs for its service territory. LIPA and NYPA administers programs within their territories. NYSERDA administers statewide program. Currently proceedings are underway to examine how utilities may also administer some EE programs to supplement the NYSERDA efforts.	In 2007, Gov Spitzer set a new policy goal to reduce electricity use in 2015 by 15%. Shortly thereafter, the NYPSC established an Energy Portfolio Standard Proceeding to determine the best approach for meeting this target.
OR	7	9	0.8%	PGE's and PacifiCorp collect a 3% public purpose charge. Idaho Power's programs are funded through a tariff rider.	Has been N/A due to non-utility administration.	Pending, partial. PGE is asking for an electric decoupling mechanism in its rate case UE 197. Oregon adopted natural gas utility decoupling several years ago.	The bulk of the IOU funds are administered through the Energy Trust Of Oregon (ETO) which is a non-profit third party. Idaho Power administers its own funds.	The OR PUC establishes annual electric and natural gas efficiency performance targets for the ETO.
MN	7	6	0.6%	IOUs & Dakota Electric (only regulated coop) recover costs through rates. Munis and unreg coops have no required method of cost recovery.	Yes, share of benefits	No, but state is examining the issue.	Utilities	The New Generation Energy Act of 2007 set energy-saving goals of at least 0.75% of gross annual retail energy sales by 2009; at least 1.0% of gross annual retail energy sales by 2010; and at least 1.5% of gross annual retail energy sales by 2012 and each year thereafter .

State	Median rank by expert panel	Number of times selected	2006 EE savings as % of total state kWh sales	Type of cost recovery	Shareholder incentives	Decoupling	Who administers programs	EERS requirement
NJ	9	7	0.3%	Energy efficiency programs are funded by a monthly charge (system benefits charge) on customers' electric bills.	N/A due to non-utility administration, but the contractors selected by the Board have performance goals and rewards built into their contracts.	Historically no but, in January 08 a NJ law allowed electric and gas utility rate structures that can reduce or eliminate disincentives to encourage utilities to pursue energy efficiency and conservation efforts. To date, nothing is in place.	Office of Clean Energy, Board of Public Utilities. "Energy Master Plan" released Oct 08 by BPU calls for consideration of additional approaches to achieve much higher savings, which could include addition of utility programs.	Jun07 legis auth (didn't require) the BPU to adopt elec & gas EE portfolio standards, with savings goals up to 20% by 2020. Workshops/hearings to develop the details began in late 2007. Currently, the Board contracted 2007 perf. goals (with program mngrs) of 257 million kWh and 452 billion Btu of NG.
WA	9	6	0.7%	The IOUs recover their costs through tariff riders.	Puget Sound Energy is currently operating under a pilot Electric Energy Efficiency Incentive.	No (partial and limited gas decoupling only)	Utilities	Qualifying utilities (those with more than 25,000 customers in WA) must "pursue all available conservation that is cost-effective, reliable and feasible."
TX	11	5	0.1%	An Energy Efficiency Cost Recovery Factor is included in the utilities' tariffs that permits the utilities to recover the reasonable costs of providing EE programs.	Yes, share of benefits	No	Utilities	June 07 legislation, HB6393, raised the EE goal of electric utilities from 10% of annual demand growth to 15% in 2008 and 20% in 2009.

State	Median rank by expert panel	Number of times selected	2006 EE savings as % of total state kWh sales	Type of cost recovery	Shareholder incentives	Decoupling	Who administers programs	EERS requirement
IA	11	3	0.7%	Regulated IOUs recover costs of programs approved by the Iowa Utilities Board through tariff riders on customer bills. This is an automatic rate pass-through, reconciled annually to prevent over-recovery or under-recovery.	No	No	Utilities	The Iowa Utilities Board has instructed the utilities to develop and analyze scenarios for increasing energy savings to a level of 1.5% of retail energy sales by the year 2012.
RI	13	2	1.2%	A systems benefit charge and funds received from Small Business Program and Large Commercial and Industrial Technical Assistance co-payments.	Yes, NGRID. Four performance-based metrics by sector.	No	Utilities	None in place or proposed.
NV	14	1	0.6%	The utility companies collect an energy efficiency system benefits charge through customers' electric rates.	Yes, bonus rate of return	No (gas only).	Utilities	In 2005, the RPS was changed to include EE. RE and EE must meet 20% of the state's electricity needs by 2015, of which up to 25% can be met with EE. (With gradually rising targets up to 2015).

The Type of Cost Recovery for Energy Efficiency Programs

To begin, we see in Table 7 that every one of these leading states has a well-established and substantial funding mechanism for providing the revenues necessary to operate the energy efficiency programs. This is not surprising, as it has been our observation from our previous national research that having a secure funding mechanism is a crucial threshold condition for achieving serious utility-sector energy efficiency programs in a state.

In general, there are two basic types of funding mechanisms among these states: (1) a per-kWh "public benefits charge" type of assessment, usually applied on a statewide basis; or (2) a specifically determined rate charge, usually applied on a utility-by-utility basis. Intuitively, there is no inherent reason why one funding mechanism should produce superior energy efficiency results. On the other hand, we note that the nine states in our group with statewide public benefits charge types of approaches (CA, MA, CT, VT, NY, OR, MN, NJ and RI) had an average 2006 savings accomplishment of 0.87 percent of total sales, while the five states with more of an individual utility approach (WI, WA, TX, IA, and NV) had an average savings of 0.52 percent. Nevertheless, we find no reason to conclude that the type of funding mechanism per se is a causal factor in determining savings results.

One other observation in this area that is worthy of note is that some states confronting demands for major increases in energy efficiency achievement are combining funding mechanisms (e.g., adding a supplemental "resource procurement" budget to the existing public benefits funding budget) in order to generate more revenues for energy efficiency programs. Some prominent examples of this emerging approach include California and Connecticut, and such policies are also under consideration in New York and Wisconsin.

Shareholder Incentives

Nine of the 14 states in our "top states" group utilize an approach whereby the utilities are the primary administrators of the utility-sector energy efficiency programs. Of those nine top states, seven feature some type of "shareholder incentive" tied to utility energy efficiency performance.[9]

The other five states (VT, WI, NY, OR, NJ) in our top states group have their utility-sector energy efficiency programs administered by a state agency or an independent non-profit organization, so technically the issue of utility shareholder incentives for good energy efficiency performance does not apply. However, two of the states with non-utility administration (VT and NJ) have specific economic incentives tied to energy efficiency savings performance by the entities responsible for delivering the programs, and two more of those states (WI and NY) are considering the addition of some utility-delivered energy efficiency programs which would have utility shareholder incentives incorporated.

In summary, the concept of having direct financial incentives attached to good performance in delivering utility-sector energy efficiency programs is becoming nearly universal among top-performing states.

Decoupling

At the time of the energy savings achievements that we have used to characterize our top states (i.e. 2006 and 2007), only one of the 14 top states had decoupling in place for electric utilities. (A few states in the group have implemented decoupling for natural gas utilities, as indicated in the table.) Clearly, decoupling has not been a major factor in the energy efficiency success of leading states to date.

[9] This report does not examine the different types of shareholder incentives being used in the various states. For information on that subject, see Kushler, York & Witte 2006.

However, consistent with the ratings of our expert panel regarding key factors that will be important in the future, there is a rapidly growing interest among leading states in the policy of electric decoupling. Three key states (Connecticut, Massachusetts and New York) have decided that electric decoupling will be implemented utility-by-utility in their next rate cases, and one state (Wisconsin) has already approved a settlement agreement containing decoupling for one utility. Several other states are in various stages of investigating or proceeding toward implementation of electric decoupling (including Vermont, Minnesota and New Jersey).

In our assessment, the policy of electric decoupling will become increasingly important as states set energy savings goals that are large enough that total utility sales growth will be flat (or even declining) over time. Historically, electric utilities have tended to resist decoupling because they perceived that they could likely "win on the upside" by having total sales exceed forecasted sales levels.[10] As large new energy efficiency requirements change that perception, decoupling will be much more likely to be embraced as a policy to mitigate the adverse economic consequences of customer energy efficiency on utilities.

Who Administers the Energy Efficiency Programs

As can be seen in the table, there is a good mix of administrative approaches across these top 14 states. Nine states feature predominantly utility administration (CA, MA, CT, NM, WA, TX, IA, RI, NV); three states have administration by an independent non-profit organization selected by the state (VT, OR, WI); and two states feature administration by a state agency (NY, NJ). The fact that there is such a variety of administrative approaches across these "top states" reinforces the conclusion in our prior research: that there is no single "best" approach to the administration of utility-sector energy efficiency programs. Rather, there are strong successes using each type of administration, and a decision on administration is best made after considering the unique characteristics of a particular state (e.g., see Kushler, York & Witte 2004). We see no reason to change that conclusion, based on the results of this current research.

Having an Energy Efficiency Resource Standard (EERS) Requirement

It is noteworthy that in the opinion of our expert panel, "having a strong state legislative requirement" for energy efficiency was the second highest rated factor "up until now" and tied for the highest factor (with size of the energy efficiency budget) for future importance. Over the past few years, the trend in the industry has been to shift from setting *spending* requirements to setting *energy savings* requirements (most often expressed as a percentage of total utility sales), which has given rise to the terminology "Energy Efficiency Resource Standard" (analogous to a "Renewable Portfolio Standard"). At last count, ACEEE had identified a total of at least 18 states with some form of an EERS (http://aceee.org/energy/state/policies/EERS_Summary_5-7-08.pdf).

Among our 14 top states in this project, at least eight could be classified as having an EERS type of approach. Some of these have been established legislatively (e.g., CT, MN, TX, NV), while others have been established administratively, including through regulatory orders (e.g., CA, VT, NY). The EERS approach is a relatively new development in the industry, so it cannot be considered a major factor in the historical energy efficiency success of these states. However, it seems clear that establishing strong energy savings requirements will be a leading policy tool used to secure large utility-sector energy efficiency accomplishments in the future.

[10] We should be clear that by "decoupling" we are referring to true symmetrical decoupling, whereby actual sales above or below forecasted levels are "trued up", with shortfalls collected from customers and excess sales revenues refunded to customers. There are other alternative methods for addressing the utility concern about "lost revenues" from energy efficiency programs, such as 'direct lost-revenue recovery' and 'straight fixed-variable rate design' (i.e., increased fixed monthly charge). However, those alternative methods are undesirable (for reasons described in Kushler, York & Witte 2006), and we do not consider those alternative methods to be "decoupling".

Feedback from Representatives of Top Performing States

The final research strategy we utilized in this study was to directly solicit feedback from key representatives[11] of each of the top 14 states identified by our expert panel. In these interviews we asked for their assessment of the most important factors that have contributed to their state's strong performance in utility-sector energy efficiency; their thoughts on strategies and programs that will be needed to achieve greater savings; and any final "lessons learned" or recommendations for the future. Highlight comments from these interviews are presented below.[12]

Key Contributing Factors to Strong Energy Efficiency Accomplishments

PUBLIC AND POLICYMAKER/REGULATOR SUPPORT

Political support, and as a result, sufficient funding (MA)

Consistent, strong support from Governors over time for energy efficiency (NY)

A customer base more willing to pay for energy efficiency than in some other regions (& the Northwest Power and Conservation Council has impacted this through educational efforts) (WA)

Having a lot of public advocacy for energy efficiency programs (OR)

Long history of strong support for energy efficiency by regulatory agencies in the state, and they have made it a high priority (CA)

A consistent, high level of policy support for energy efficiency in the state for over 2 decades (MN)

Have had high level of support from both governors and legislatures over the years. The Board of Public Utilities also has shown consistent, strong support for programs. (NJ)

Having regulators that are open to new ideas and willing to try new approaches (RI)

The regulatory commission has had consistent expectations for utilities regarding energy efficiency for many years, and been willing to use its available carrots and sticks (IA)

A long history of experience providing energy efficiency programs (MN)

Good program design—programs have been changed and evolved over a long time—updated and improved as needed (NJ)

A lot of talented and experienced people working to deliver these programs (NY)

Very diligent oversight board with multiple parties, including utilities, plus key assistance from technical consultants (CT)

Good collaboration among all the key parties, including the Commission, the utilities, customer groups and environmental advocates (TX, RI, CT)

Willingness of the utilities to work with customers and trade allies to persuade them to participate with energy efficiency efforts (IA)

[11] Generally these were conducted with staff at the utility regulatory commission in each state.
[12] We don't identify any of our respondents by name. But to help provide context, we will generally identify the state.

ENERGY COSTS

High energy costs have been a primary driver for the Commission's long support for DSM. More recently, the high cost of natural gas (used for most new generation) has been a key driver. (NV)

High energy costs have made it much easier to pitch energy efficiency programs to customers (RI)

POLICY FRAMEWORK

Having a good Integrated Resource Planning (IRP) framework for utilities provides an important basis for energy efficiency as a significant utility resource (WI)

Having well-established mechanisms for practical and effective cost-recovery for energy efficiency programs (WI)

Allowing energy efficiency to meet up to 25% of the state RPS requirement has been a key driver for utilities, because energy efficiency is a much less expensive option (NV)

State has mandated energy efficiency as the top new resource in the "loading order" for new resource investments (CA)

Having an "intervener compensation fund" has allowed for effective public involvement in utility planning and rate cases, which has yielded much more public discussion about the role of energy efficiency (WI)

A long-term, strong commitment to the energy efficiency mechanism is important so that the provider can engage in comprehensive program efforts that span multiple years, rather than only focusing on short-term objectives (VT)

Having a mechanism whereby the utility/EE administrator is appropriately rewarded for positive energy efficiency savings performance (and not just for spending money) (VT)

Having in place a process for conducting, and using the results of, independent expert evaluation of the energy efficiency programs (both for documenting impacts as well as for using evaluation results to continually improve energy efficiency programs (VT)

Program Related Factors Contributing to High Energy Savings

TYPES OF PROGRAMS

Need comprehensive programs; more direct install; more wholistic programs; are looking at both technical and behavioral aspects (CT)

Will be putting some greater emphasis on the C&I sector, including new construction and major renovation program, as well as a small C&I retrofit program (MA)

Are developing new and better-targeted programs based on the concept of identifying specific customer segments within major sectors (CA)

Looking at the use of multi-year projects for large industrial customers, to better fit the customers' internal project schedules (MN)

Our incremental funding will have a particular focus on the commercial sector (OR)

Particularly need effort devoted to the residential sector, which has been dominated by CFL savings thus far (WI)

Examining ways to better incorporate strategies to affect customer behavior, in order to capture additional savings that are influenced by behavioral factors (MN)

Setting proper incentive levels in the program is important. Must be high enough to move behavior, but not too high (CT)

Looking at issues regarding the quality of installation of HVAC and other building systems, in order to enhance savings actually achieved from measures installed (MN)

Need to get HVAC contractors to do a more extensive HVAC tune-up (MA)

For most programs, we are really making adjustments more at the margins (e.g., adjusting rebate levels) and looking for new areas of concentration and shifting program spending accordingly (RI)

For large C&I, we're focusing more on customized flexible approaches that help achieve more savings per customer—addressing their specific needs rather than making them have to fit more prescriptive program approaches (RI)

Are looking at shifting budget allocation from about 50/50 C&I vs. Residential to 65% C&I and 35% residential, due to the perception of larger potential in the C&I sector (WI)

Are examining the potential for programs that would bundle comprehensive energy efficiency and renewable energy measures (WI)

Utilities recently have been doing more to promote deeper and more comprehensive savings such as increasing incentive amounts for customers that implement more extensive sets of qualified measures (e.g., for a full package of measures in residential new construction) and raising incentives for certain targeted measures in other programs as well (IA)

Make effective use of energy efficiency service companies to deliver savings in key markets, through well-designed programs consistently applied throughout the state (TX)

To achieve higher goals established in Energy Master Plan, recognized the need to get into "all existing buildings" to make necessary improvements (NJ)

For residential customers, looking at ways to finance improvements on customer bills, implement some kind of financing mechanism. Looking at trying to achieve deeper savings for C&I customers—looking at a "pay for performance" type approach—incentive levels increase with increased savings achieved—try to get more comprehensive packages of measures implemented (NJ)

POLICY RELATED ASPECTS

New rules will give utilities better incentives for achieving new and more aggressive savings targets (CA)

One factor that will be important is more incentive-based regulation of utilities—performance based on reaching energy savings goals (NJ)

Establishing an energy efficiency cost recovery factor for ensuring timely and reasonable cost recovery for utility expenditures is a key element (TX)

Establishing energy efficiency as the first resource in the loading order, and having this backed up by both executive orders and legislation, has been very important (CA)

Going to a statewide program model has been very important—moved from a model of each utility (7) doing programs. Statewide model offers much more uniform program design, much simpler for

contractors, customers and marketing—don't have to worry about service territories and which customers qualify under which program (NJ)

Other Related Observations and Recommendations

Customers need to be educated about savings opportunities and properly motivated. Rather than just a prescribed approach, could get more savings if customers really understood how the programs work and the benefits they will get out of them (MA)

Evaluations show that participants in the C&I sector are achieving relatively deep impacts already; not so on the residential side—maybe largely due to a focus on CFLs in residential programs. The program administrator is planning to examine how to achieve deeper savings in the residential sector. Some T&D issues are helping to force this issue—there's discussion about how much can be done to reduce customer demand, especially in targeted areas where major new T&D expansions are proposed. (WI)

Retailers need to stock the highest efficiency appliances, rather than just above the energy efficient threshold (MA)

Negotiated cooperative promotion with manufacturers and suppliers worked well with CFLs—could work well with other technologies like HVAC (MA)

Bring public utilities into the policy for energy savings targets, in order to better achieve statewide goals (CA)

Budget priorities and allocations are also likely to change. Historically budgets have been tilted toward the residential sector—looking ahead to 2009-2012 there is a significant shift to increased spending on the C&I side—not reducing residential budgets, but budget increases & extra funding is going primarily to C&I as that's where greater savings can be achieved at lower costs (NJ)

The Governor's task force on global warming is also driving the PSC to examine deeper savings—looking at how to achieve 1-2% per year (rather than the current levels more like 0.5% per year) GHG savings goals will drive greater emphasis on energy savings—not peak demand reductions (WI)

CONCLUSIONS

In recognition of the significant challenges facing states and utilities in complying with the aggressive Energy Efficiency Resource Standard (EERS) policies that are being increasingly adopted by state policymakers and regulators, this project sought to identify and explore key factors associated with success in achieving high levels of energy efficiency savings. We solicited input from acknowledged experts in the utility-sector energy efficiency field; we identified a core list of 14 "top states" in terms of utility-sector energy efficiency achievements; we analyzed reports and data from those states and from the U.S. Energy Information Administration; and we interviewed key representatives from each of those top 14 states. The following are some of our highlight observations.

- A number of states are achieving very significant levels of utility-sector energy efficiency savings, and these savings levels show increases over what was being achieved earlier in this decade.

- However, with one exception (Vermont), no states are yet reporting energy efficiency savings at the higher levels being called for in a number of recent state policy decisions (i.e., in the range of 1.5% to 2.0% per year or more).

- A number of key factors are associated with high levels of utility-sector energy efficiency achievements, including particularly having relatively high levels of funding for energy efficiency

programs and having strong legislative and regulatory requirements and support for energy efficiency.

- In meeting future, higher, energy efficiency savings requirements, key additional factors identified include: having appropriate incentives for utilities to pursue energy efficiency (including both shareholder incentives and decoupling) and securing the commitment of top utility management; having high quality energy efficiency programs; and appropriately recognizing the cost of carbon emissions.

- Other issues such as who administers the energy efficiency programs (utilities or state government or independent 3rd parties), or whether a state is "restructured", or particular demographics or climate, are not regarded as particularly important factors in whether or not a state can achieve high levels of energy efficiency achievements.

- To date, utility-sector energy efficiency savings achievements have been heavily dominated by savings in the "lighting" area, and there is a widely-acknowledged need to increase savings in other end-use and program areas.

- The major increases in utility "supply-side" costs (e.g., fuel costs and power plant construction costs) that have occurred in the last few years should allow for program portfolios to more aggressively pursue energy efficiency savings in "non-lighting" areas and still be cost-effective. This will likely include raising energy efficiency incentives to customers.

- A number of leading states have recently announced goals to dramatically increase utility-sector energy efficiency savings, and are taking concrete actions to implement those policies. Several state examples are described in Appendix C.

REFERENCES

Blumstein, C., Krieg, L., Schipper, L., and C. York. 1980. "Overcoming Social and Institutional Barriers to Energy Efficiency. *Energy* 5(4): 355-372.

Brattle Group. *Integrated Resource Plan for Connecticut.* Prepared for Connecticut Light and Power and The United Illuminating Company. January 1, 2008.

Cowart, R. 2001. *Efficient Reliability: The Critical Role of Demand-Side Resources in Power Systems and Markets.* Prepared for the National Association of Regulatory Utility Commissioners. The Regulatory Assistance Project: Montpelier, VT.

Eldridge, Maggie, Max Neubauer, Dan York, Shruti Vaidyanathan, Anna Chittum, and Steven Nadel. *The 2008 State Energy Efficiency Scorecard.* Washington, D.C.: American Council for an Energy-Efficient Economy. October 2008.

Golove, W. and J. Eto. 1996. *Market Barriers to Energy Efficiency: A Critical Reappraisal of the Rationale for Public Policies to Promote Energy Efficiency.* Berkeley, California: Lawrence Berkeley National Laboratory.

Kushler, Martin, Dan York and Patti Witte. *Five Years In: An Examination of the First Half-Decade of Public Benefits Energy Efficiency Policies.* Washington, D.C.: American Council for an Energy-Efficient Economy. 2004.

Kushler, Martin, Dan York and Patti Witte. *Aligning Utility Interests with Energy Efficiency Objectives: A Review of Recent Efforts at Decoupling and Performance Incentives.* Washington, D.C.: American Council for an Energy-Efficient Economy. 2006.

Kushler, Martin and Ed Vine. *Examining California's Energy Efficiency Policy Response to the 2000/2001 Electricity Crisis.* Presented at the 2003 ACEEE National Conference on Energy Efficiency as a Resource. 2003.

The State of New Jersey. *New Jersey Energy Master Plan.* October 2008.

U.S. Department of Energy and U.S. Environmental Protection Agency, *National Action Plan for Energy Efficiency.* Washington, D.C., 2006.

Xcel Energy. *2009/2010 Demand-Side Management Biennial Plan.* August 11, 2008.

APPENDIX A: ENERGY EFFICIENCY INDUSTRY EXPERTS PARTICIPATING IN OUR EXPERT PANEL

Tom Eckman	Northwest Power and Conservation Council
George Edgar	Wisconsin Energy Conservation Corporation
Chuck Goldman	Lawrence Berkeley National Laboratory
Nick Hall	Tecmarket Works
Ken Keating	Bonneville Power Administration (retired)
Ralph Prahl	Ralph Prahl & Associates
Jeff Schlegel	Schlegel & Associates
Sheldon Strom	Minnesota Center for Energy and the Environment
Ed Vine	Lawrence Berkeley National Laboratory

APPENDIX B. TABLE 1. RANKING OF STATES BY NATURAL GAS EFFICIENCY PROGRAMS

State	Median Rank	Number of Times Selected	EE savings as a % of total sales to end-use customers	EE program Spending (million$)
California	2.5	6	0.25%	94.1
Massachusetts	4	6	NA	25.6
Vermont	4	4	0.73%	1.3
Wisconsin	4.5	6	0.54%	42.8
Minnesota	5	4	0.64%	16.3
New York	5.5	4	0.10%	NA
Oregon	6	6	0.17%	12.1
New Jersey	7	4	0.15%	32.7
Connecticut	8.5	3	NA	NA
Washington	10	3	NA	8.2
Iowa	11	2	0.89%	31.1
Nevada	12.5	1	NA	NA
Utah	12.5	1	NA	NA

APPENDIX C. EXAMPLES OF LEADING STATES PLANNING SIGNIFICANT ENERGY EFFICIENCY PROGRAM EXPANSIONS

Summary Profiles

Leading States Planning Significant Energy Efficiency Program Expansions
California

Background
California is a long-time leading state for its utility-sector customer energy efficiency programs, which date back to the 1970s and have grown and evolved substantially over 3 decades. Its programs and related energy efficiency policies have had a significant impact on per capita electricity use, which has remained essentially constant over the past 30 years.

For 2006 California's investor-owned utilities reported electric energy efficiency savings of 1,912 GWh for total program expenditures of $357 million. For the 2006-2008 efficiency program cycle, the investor-owned utilities (IOUs) have budgeted a total of $2 billion for three years of efficiency programs. California's publicly owned utilities also administer and provide customer programs—spending over $54 million on such programs during 2005-06.

Policy Driver of Program Expansion
California has established energy efficiency as its highest priority energy resource for procurement of new resources. Key legislation that established this priority are Assembly Bill 1890 (1996) and Assembly Bill 995 (2000). With these foundations in place, the California Public Utilities Commission (CPUC) has created a framework and funding levels for achieving aggressive energy efficiency goals, including establishing a loading order that calls for pursuing all cost-effective efficiency resources as the top priority ahead of cost-effective renewable energy generation and finally conventional fossil-fuel generation.

A series of decisions by the California Public Utilities Commission beginning with California's Energy Action Plan of 2003 have built on the foundations established by California statutes for energy efficiency as the first priority energy resource. The plan aims to reduce peak demand and increase energy efficiency in order to:

- Minimize the need for new generation
- Reduce emissions of toxic and criteria pollutants and greenhouse gases
- Avoid environmental concerns
- Improve energy reliability
- Contribute to price stability

In an update to the 2003 Energy Action Plan, the CPUC has established a set of aggressive goals:

- To save energy during peak usage hours of nearly 5,000 MW by 2013.
- Achieve cumulative energy savings goal of more than 23,000 GWh by 2013.
- These savings are projected to meet 55 to 59 percent of the utilities' incremental electric energy needs in 2004-2013.
- The state set energy savings goals for investor-owned utilities for 2004-2013, which are expected to save about 1% of total forecast electricity sales per year.
- Target cumulative natural gas savings to total 453 MMth by 2013, a 116 percent increase in savings over the next decade.

In 2007 the CPUC (Decision D. 07-10-032) set in motion the creation of a statewide strategic plan for 2009-2020. A cornerstone of the decision was the CPUC's endorsement of three "Big, Bold" Programmatic Initiatives:

- All new residential and commercial buildings in California should be zero net energy in 2020 and 2030, respectively;
- California's heating, ventilation and air conditioning (HVAC) industry shall be reshaped to ensure optimal performance of small HVAC systems.

The Decision also targets aggressive strategies to meet the state's 2020 goals for greenhouse gas reductions established in California's Global Warming Solutions Act of 2006. As of December 2007, preliminary data indicate that the state's utilities are a little ahead of schedule in meeting the long-term goals for energy and peak demand savings.

Policies to Address Utility Disincentives/Incentives Regarding Energy Efficiency
Decoupling mechanisms have been developed and applied in individual cases with the IOU utilities. All of the investor-owned electric and gas utilities have decoupling. Decoupling has been in place for many years in California and is an integral policy for California's "big, bold" energy efficiency initiative. There have been no specific evaluations performed of the decoupling mechanisms to date.

The CPUC also has established reward structures for successful energy efficiency programs. The California Public Utilities Commission recently defined a new Risk/Reward Mechanism for investor-owned utilities in the Energy Efficiency Proceeding (CPUC Rulemaking 06-04-010). Decision 07-9-043 (October 2007) establishes a minimum performance standard for the utilities under which incentive earnings accrue only if the IOU energy efficiency portfolio of programs achieves at least 85 percent of the CPUC's goals. The incentive formula calls for utilities to receive 9% of net benefits if they achieve between 85-99% of savings goals, and 12% of net benefits if they meet or exceed savings goals up to the earnings caps established for each utility. In addition, utilities can earn a percentage of their incentive earnings before evaluation procedures verify their impacts.

Strategies and Actions Being Taken to Achieve the New Goals
The utilities (IOUs) are in the middle of a three-year cycle (2006-2008) and are in the process of developing plans for the next 3 year cycle (2009-2011). They are coming up with brand new programs and program designs—especially targeting areas that have not been well covered before (customer segments). The utilities are exploring ways to capture additional, deeper savings. One significant development is that additional "procurement funding" is being authorized to increase utility energy efficiency program budgets. These procurement funds are in addition to funding provided by California's public benefits funding mechanism.

The CPUC's program rules are being changed to allow the utilities to count savings differently than in the past, which should benefit the utilities for getting credit for savings that may not have been credited earlier. The new rules also will give utilities better incentives for achieving savings targets.

The role of publicly owned utilities (POUs) also is increasing as they are subject to meeting legislative targets as well. POUs are just being required to submit energy savings targets and be included in planning. This is necessary to achieve state totals, which are in turn necessary relative to greenhouse gas (GHG) legislation and associated carbon reductions.

A first step in California's expanded efforts was the creation of the state's first single statewide long-term strategic energy-efficiency plan, which was released in July 2008. This strategic planning rests on three pillars: collaboration, innovation and integration.
This plan was the result of the CPUC's 2007 Decision that established the "Big Bold" programmatic initiatives and goals. This Decision emphasized the importance of a strategic plan to identify new channels for delivery of energy efficiency and to develop a collaborative planning process that includes public forums and participation of a broad set of stakeholders. This process also is to foster innovation through long-term planning and identification of research and technology development efforts that must be undertaken to achieve the "Big Bold" goals (such as research on zero-energy buildings).

While specific utility program plans in response to the strategic plan have not yet been completed, the CPUC sees a number of positive outcomes from development of the plan. These include:

- Strengthening the linkage and coordination between desired long-term actions with early stage research and technology development, as well as eventual codes and standards or market transformation outcomes.

- Identification and delineation of roles and initiatives that can tap the knowledge, connections and motivations of a broad spectrum of stakeholders, including state government agencies, private enterprises, local government and utilities.
- Development of more comprehensive, multi-faceted program designs—programs that take important steps towards achieving the Big Bold goals of zero net energy and that integrate energy efficiency with other demand-side objectives and marketing. This also includes expanded partnerships with local governments interested in high efficiency and green building initiatives.
- Greatly increased participation by local government associations and support organizations—representing 500 local governments—in addition to about the two dozen leading local governments that already have been strong partners with utility programs. Such involvement is key to achieving truly statewide approaches and program results.
- Raised awareness of workforce development as a vital issue in meeting targets.
- Created a task force on marketing, education and outreach to develop more effective mechanisms for engaging opinion leaders, consumers and the business community in communicating and advocating the message of energy efficiency action.

Leading States Planning Significant Energy Efficiency Program Expansions
Colorado

Background
Colorado's utilities administer energy efficiency programs under a regulated structure with oversight by the Colorado Public Utilities Commission (PUC). Xcel Energy, operating as a Public Service Company of Colorado Company, is the major investor-owned utility in the state. Xcel Energy's energy efficiency programs are funded using a DSM Cost Adjustment Mechanism rate rider. Xcel Energy's programs are administered by the company after approval from the Colorado PUC.

Policy Driver of Program Expansion
In 2007, House Bill 07-1037 was enacted, clarifying various aspects of energy efficiency program implementation. Moreover, the bill directs the PUC to establish energy savings goals for gas and electric utilities and to give investor-owned utilities a financial incentive for implementing cost-effective efficiency programs. As a result, in a 2008 PUC decision, Xcel Energy's goals were set which call for the utility to help its customers reduce their electricity use in 2020 by about 11.5%, saving 3,669 GWh, from energy efficiency programs implemented during 2009-2020. The anticipated cost of Xcel Energy's enhanced DSM program would be approximately $738 million over the period 2009 through 2020.

Based on HB 07-1037, the PUC must establish energy savings goals for retail electric and gas utilities. The targets for Xcel Energy begin at 0.53 percent of energy sales reduced in 2009, increasing to a cumulative 11.5 percent of energy sales reduced in 2020.

Policies to Address Utility Disincentives/Incentives Regarding Energy Efficiency
In response to HB 07-1037, the Colorado PUC implemented a performance-based incentive, enabling Xcel Energy to earn a profit on its DSM expenditures as long as it achieves at least 80% of its energy savings goal in any one year, in addition to recovering the costs for its DSM programs. The incentive is tied to energy savings achieved and the net economic benefits of the programs, and is capped at 20% of the utility's DSM expenditures.

Strategies and Actions Being Taken to Achieve the New Goals
Xcel Energy's August 11, 2008 *2009/2010 Demand-Side Management Biennial Plan*, filed with the Colorado PUC, includes budgets on electricity and natural gas DSM programs of $61 million in 2009 and $76 million in 2010. According to the Southwest Energy Efficiency Project (SWEEP), this 2009 budget is approximately triple what Xcel is spending on DSM programs in 2008.

Numerous program changes are included in Xcel Energy's Plan. Natural gas program DSM programs will be offered for the first time to the company's entire customer base, not just low-income households as had been the case. The Plan introduces a number of new or enhanced electric DSM programs, including the following business programs:

- Data Center Efficiency,
- New Construction,
- Process Efficiency,
- Segment Efficiency,
- Self Direct,
- Small Business Lighting Efficiency, and
- Standard Offer.

Similarly, for residential customers Xcel Energy is offering a comprehensive slate of new or enhanced electric DSM programs, namely:

- ENERGY STAR Retailer Incentive,

- ENERGY STAR New Homes,
- Home Performance with ENERGY STAR, and
- School Education Kits.

Xcel Energy also proposes major initiatives that will place greater emphasis on programs and services "[T]o redefine the energy efficiency marketplace through market transformation and customer education." These initiatives include:

- Customer Behavioral Change for Residential Program and
- Customer Behavioral Change for Business Program.

Also included in its DSM plan are a number of programs dedicated to customer education, such as Business Energy Analysis and Residential Home Energy Audits. These more indirect programs are designed to provide customers with specific feedback and identify potential actions they can take to reduce energy use and costs.

Xcel Energy also intends to continue working with key stakeholders in order to realize the goals established in its biennial plan. All its DSM programs offer opportunities for stakeholder involvement and feedback. Xcel Energy also will continue to host semi-annual DSM Roundtables as forums for open dialogue and discussion about programs and DSM results.

The Colorado Public Utilities Commission also has made allowances for start-up and pilot programs—such programs may operate for initial periods during which they may not meet established cost effectiveness criteria (a "modified total resource cost" test). Several of Xcel Energy's new programs fall into this category. They will be implemented and evaluation results will be used to make decisions regarding continuance or termination.

Leading States Planning Significant Energy Efficiency Program Expansions
Connecticut

Background
Connecticut's utility companies have offered conservation and load management (C&LM) programs to their customers for decades. Currently, Connecticut's distribution utilities are required by statute (PA 98–28) to provide C&LM programs. The programs are subject to the review and approval by the Department of Public Utility Control (DPUC). The programs are supported through the Connecticut Energy Efficiency Fund (CEEF). The Energy Conservation Management Board (ECMB), which is appointed by the DPUC, administers the CEEF, which is sustained by a monthly system benefits charge on customers' electric bills.

The ECMB is also responsible for reviewing the plans submitted by the utilities. It is required that all programs included in the plans pass a benefit-cost test. Each year the ECMB meets to review and approve the distribution utility C&LM program plans. These are formal, uncontested hearings. Board consultants work with the utilities in developing their plans. The utilities set goals (savings and other program metrics) for program results in conjunction with these hearings. The plan must ultimately be approved by the DPUC. Each electric distribution company keeps a separate CEEF. Disbursements from the fund, for projects included in a plan, must be approved by the DPUC. The ECMB is required to submit annual reports to the legislature. These reports are to include expenditures, fund balances, and benefit-cost analyses for the previous year's programs. Administrative costs are not to exceed 5 percent of the total revenue collected.

Currently, the distribution utilities charge approximately 3 mills/kWh. Starting in 2006, municipal electric utilities charged at least 1 mill/kWh for their C&LM programs, with the charge increasing in four steps to 2.5 mill/kWh by January 1, 2011. Natural gas utilities started offering energy efficiency programs in 2005.

Policy Driver of Program Expansion
In 2007, the Connecticut legislature enacted a law that builds on the state's strong record of energy efficiency program accomplishments. HB 7432, An Act Concerning Electricity and Energy Efficiency, places new requirements for energy efficiency and establishes new regulatory mechanisms, such as decoupling, to support achievement of these goals. Utilities are required to procure all cost-effective energy efficiency as the first priority resource. The utility companies plan to achieve 1.5% savings (of total sales) each year with corresponding increased energy efficiency program budgets.

Policies to Address Utility Disincentives/Incentives Regarding Energy Efficiency
Connecticut's 2007 Act Concerning Electricity and Energy Efficiency established very specific requirements for decoupling. The act requires the Department of Public Utility Control to order the state's electric and natural gas distribution companies to decouple distribution revenues from the volume of natural gas or electricity sales through one of three strategies outlined in the act (singly or in combination): (1) A mechanism that adjusts actual distribution revenues to allowed distribution revenues, (2) rate design changes that increase the amount of revenue recovered through fixed distribution charges, or (3) a sales adjustment clause, rate design changes that increase the amount of revenue recovered through fixed distribution charges, or both.

As part of required annual hearings, the Board also looks back at the past year's results relative to the established goals and determines a performance incentive for the distribution utilities. Incentives are legislated in PA 88-57, Substitute House Bill 5796, *An Act Concerning Conservation and Utility Company Conversion from Oil Heating Systems to Gas or Electric Heating System.* This Act allows a utility to earn return on the rate base for multi-year conservation and load management investments at a rate of at least 1% but no more than 5% higher than a company's authorized return after taxes. The incentive is set annually and is contingent upon a company meeting its savings goals and other targets. Program costs are recovered through rates. Anticipated incentives are built into the annual budgets. Over the course of several dockets, the DPUC has affirmed the value of the incentive, and

that the expenditures used to calculate the incentive may include administrative and overhead costs, but not Board costs and the incentive costs.

PA 05-1, *An Act Concerning Energy Independence*, required the CT DPUC, by January 1, 2006, to establish a program to provide incentives of $25 per kilowatt-year to the companies for energy efficiency programs approved by DPUC and developed on or after January 1, 2006. The programs are for load curtailment, demand reduction, and retrofit energy efficiency that reduce federally mandated congestion charges (FMCC). This program runs from January 1, 2006 to December 31, 2010. Incentives are only awarded if the projected reduction in FMCC costs exceeds the incentive amount. These programs and the incentives are funded by the FMCC charge.

Strategies and Actions Being Taken to Achieve the New Goals

As a result of the Act Concerning Electricity and Energy Efficiency, utility program budgets for energy efficiency will increase in order to meet the requirements of this bill. In addition to the system benefits charge, the CEEF programs will also be funded through the ISO-New England Forward Capacity Market (Class III Renewable Energy Credits for energy efficiency) and the Regional Greenhouse Gas Initiative.

Prior to passage of the Act Concerning Electricity and Energy Efficiency, utilities were not required to submit integrated resource plans under Connecticut's restructured utility markets. With passage of this act, however, this picture will change significantly. The act places new requirements on the electric distribution companies to review the state's energy and capacity resource assessment and develop a comprehensive plan for procurement of energy resources, considering a full array of supply and demand resources. Resource selection and procurement is to be done so as to minimize the cost of such resources and to maximize consumer benefits consistent with the state's environmental goals.

The distribution companies must submit annual assessments of energy and capacity requirements of customers for the next three, five and ten years, as well as plans to "eliminate growth in electric demand" and other demand-side and environmental objectives. Resource needs are first to be met through "all available energy efficiency resources that are cost-effective, reliable and feasible." In the *Integrated Resource Plan for Connecticut*, January 1, 2008, prepared by the Brattle Group for Connecticut Light and Power and The United Illuminating Company, Appendix D describes a C&LM-based solution to eliminating load growth in Connecticut over the next decade. The solution is based on the research and work conducted by the utility companies, the DPUC, the ECMB and other stakeholders over the past several years.

Leading States Planning Significant Energy Efficiency Program Expansions
New Jersey

Background
New Jersey has established a state-wide energy efficiency program, the New Jersey Clean Energy Program, which is administered by the Office of Clean Energy within the Board of Public Utilities. This structure has been in place since 2003. A collaborative of stakeholders, the New Jersey Clean Energy Council, provides input to the Board of Public Utilities on programs. Prior to creation of this structure the regulated energy utilities in New Jersey had been responsible for administering customer energy efficiency programs with oversight from the Board of Public Utilities. The utilities worked together through a collaborative to coordinate their efforts and ensure program consistency.

Energy efficiency programs are funded by a systems benefits charge assessed against all investor-owned electric and natural gas utilities. The SBC is a non-bypassable fee assessed by the energy utilities at the point of use for both natural gas and electricity. Total expenditures on energy efficiency programs in 2006 were $83.2 million. New Jersey's restructuring statute requires that utilities perform "comprehensive resource assessments" for energy efficiency and renewable energy resources, which account for system needs and costs.

Policy Drivers of Program Expansion
A number of drivers are working together to expand New Jersey's efforts to realize much higher levels of energy savings through increased energy efficiency. The State of New Jersey released the *New Jersey Energy Master Plan* in October 2008, which outlines 4 key challenges facing the state relative to its supply and use of energy. It then presents a set of goals that will respond to and address these challenges. This planning was a joint effort among Governor Corzine's office, the Board of Public Utilities, and numerous stakeholders. The State worked with research centers at Rutgers University to prepare the plan and outline various scenarios.

The four key challenges identified in the Plan are:

- Growth in the supply of electricity has not been keeping up with the growth in demand;
- The price of energy has increased substantially over the past few years, has become increasingly volatile, and these trends are expected to continue;
- Without action, the State's contribution to global warming and other pollutants will continue to increase; and
- The State has much less authority over the supply and price of electricity than it used to.

If the State does nothing to address these challenges, the Plan concludes, "The economic, reliability and environmental consequences of the 'business as usual' scenario are unacceptable." It adds, "Actions must be taken to ensure that New Jersey's future energy environment provides energy that is competitively priced, reliable and consistent with the 2020 and 2050 greenhouse gas targets." The Plan outlines five broad goals to meet these challenges; one specifically addresses energy efficiency:

> *Maximize the State's energy conservation and energy efficiency to achieve reductions in energy consumption of at least 20% by 2020.*

To achieve this goal, the plan proposed four action items:

1. Redesign and transition the State's current energy efficiency programs to be implemented by the electric and gas utilities, and achieve the desired results while remaining cost-effective.
2. Work with the Legislature to authorize the development of statewide building codes to result in new construction being at least 30% more energy efficient than current state code by July 2009 and develop a strategy to achieve net zero carbon emitting buildings.
3. Work with the Legislature to set minimum energy efficiency standards for new appliances and other types of equipment currently not covered by existing standards by 2009.
4. Increase education and outreach in the public and private sectors.

Legislation passed in June 2007 authorizes (but does not require) the BPU to adopt an electric and a gas energy efficiency portfolio standard, with goals as high as 20% savings by 2020 relative to predicted consumption in 2020. Workshops and hearings to develop the details began in late 2007. The BPU has contracted with the Northeast Energy Efficiency Partnerships (NEEP) to develop a proposed portfolio of programs and associated strategies for achieving these goals. This proposal has not yet been completed but is expected late in 2008.

Policies to Address Utility Disincentives/Incentives Regarding Energy Efficiency
Decoupling is not in place or under consideration at this time. There are reward structures for successful energy efficiency programs. The contractors selected by the Board have performance goals and rewards built into their contracts. To reward program contractors to reach savings goals, the Board established specific performance goals for 2007 programs of 257 million kWh and 452 billion Btu of natural gas. Incentives are provided to the program contractors for meeting these goals, with greater incentives for achieving 120% and 140% of the goals.

Strategies and Actions Being Taken to Achieve the New Goals
The savings goals outlined in the New Jersey Energy Master Plan (20% savings by 2020) will require annual savings from all present efforts by the New Jersey Clean Energy Program to be at least doubled and even tripled. To achieve such savings requires expansion of existing budgets. The BPU already has increased budgets significantly.
To achieve these higher goals, the BPU and its contractors are looking at numerous ways to boost savings, including:

- Creating financing mechanisms for residential customers to pay for comprehensive packages of improvements on their monthly utility bills;
- Strengthening building codes and appliance standards;
- Employing an "all-hands-on-deck" approach—that is, involving all key stakeholders, including some kind of new, expanded role for utilities. The exact nature of this role hasn't been defined yet, but is to be included in forthcoming proposals.
- Incentive-based regulation of utilities—reward performance for reaching energy savings goals, for example.
- Introducing "pay for performance" approaches for commercial/industrial customers—paying proportionately higher incentives for implementing more comprehensive packages of energy efficiency measures.

Leading States Planning Significant Energy Efficiency Program Expansions
New York

Background
New York was one of the first states to establish a state-wide systems benefits charge to support energy efficiency and other public benefits energy programs. A state government authority, the New York State Energy Research and Development Authority (NYSERDA) is responsible for administering these programs, which collectively are known as "New York Energy $mart." Parallel programs are provided to customers of two publicly owned utilities, the New York Power Authority and the Long-Island Power Authority. New York Energy $mart offers a comprehensive set of programs for customers. The program administrator, NYSERDA, has pioneered a number of program concepts and been an innovator in developing and implementing new program approaches.

The New York Energy $mart Programs are funded by a monthly charge (system benefits charge) on customers' electric bills. The charge, based on the utility's sales, averages approximately 1.7 mills/kWh. Revenues collected are allocated to program categories according to a plan developed by NYSERDA and approved by the New York State Public Service Commission. NYSERDA administers the programs, typically relying on contractors and other private sector entities to deliver the program services. The system benefits fund is renewed at the discretion of the PSC. Since establishing initial funding for the systems benefits programs in 1996, the PSC has revised and renewed funding levels for five-year periods. In December 2005, the PSC increased total funding levels for systems benefits programs (includes energy efficiency, renewables, low-income and other) to $175 million/year—up from the previous level of $150 million/year (Order in Case O5-M-0090). Total spending on energy efficiency programs in New York in 2005 was $224.9 million, which includes not only the SBC-funded programs, but those offered by LIPA, NYPA and other publicly owned utilities.

Policy Drivers of Program Expansion
In April 2007, Governor Spitzer set a new policy goal to reduce electricity use in 2015 by 15% ("15 by 15"), relative to projected use in 2015. Shortly thereafter, the New York Public Service Commission (NY PSC) established an Energy Portfolio Standard Proceeding to determine the best approach for meeting this target. On June 23, 2008, the NY PSC issued, "Order Establishing Energy Efficiency Portfolio Standard and Approving Programs." The framework and broad objectives of this Order are summarized below:

> One of New York State's highest energy priorities is to develop and encourage cost-effective energy efficiency over the long term, and immediately to commence or augment near-term efficiency measures. The determinations in this Order establish the framework for ensuring that energy efficiency becomes an integral part of the New York energy industry. This initiative is in the context of the broader State policies for the development of the clean energy industry and economy in the State: policies including Executive Order No. 2 of Governor David Paterson, the Renewable Portfolio Standard, the Regional Greenhouse Gas Initiative (RGGI), and improvements in State energy building codes and appliance efficiency standards.

The Order adopts the goal of reducing electricity usage by 15% by 2015.

Policies to Address Utility Disincentives/Incentives Regarding Energy Efficiency
The New York Public Service Commission on April 20, 2007, issued a final order in a long-standing proceeding before the Commission on the issue of decoupling. The PSC in this Order requires utilities to develop and implement mechanisms that true-up forecast and actual service revenues and, as a result, significantly reduce or eliminate any disincentives caused by the recovery of utility fixed delivery costs via volumetric rates or marginal consumption blocks. The specific revenue decoupling mechanisms are to be filed in on-going and new rate cases by each utility. None has been filed or proposed to date.

Strategies and Actions Being Taken to Achieve the New Goals

The Order establishing the "energy efficiency portfolio standard" (EEPS) addresses several "foundational" issues resulting in an expanded energy efficiency program capable of attaining the goal adopted of reducing electricity usage by 15% by the year 2015. These specific issues and actions are:

- Adoption of specific, interim, three-year targets for MWh reduction, with a forecast trajectory that will achieve the efficiency goals of the proceeding.
- Approval of specific energy efficiency programs for immediate implementation--a set of "fast track" programs."
- Direction to New York's investor-owned utilities to commence collection, through the systems benefits charge (SBC) of additional funds to support the EEPS through 2011.
- Adoption of a requirement that utilities file energy efficiency programs consistent with the policies and benefit/cost factors contained in this same Order.
- Adoption of findings under the State Environmental Quality Review Act.

To achieve these targets, the Order approved almost a doubling of the existing level of SBC electric revenue collections that support programs, from $175 million annually to $334.3 million beginning October 1, 2008 and continuing in effect until December 31, 2011. The utilities may retain SBC funds for utility-administered "expedited" programs as described in the Order, and they are required to file plans with the PSC to seek approval for such energy efficiency programs. NYSERDA's "Fast Track" programs include expansion of several existing programs, namely:

- CFL program
- EmPower New York (low-income program)
- New Construction Program (commercial/industrial buildings)
- Flexible Technical Assistance (FlexTech—customized technical assistance for large C/I customers—building energy use)
- FlexTech Industrial Process (custom technical assistance specific to industrial process improvements).

Leading States Planning Significant Energy Efficiency Program Expansions
Vermont

Background
Vermont has had extensive energy efficiency programs since 1990. Originally, programs were run by the state's utilities under jurisdiction of the Vermont Public Service Board, but in 1999 the PSB transferred operations to a single, statewide "energy efficiency utility" operating under the name Efficiency Vermont and supported by public benefits funding. Vermont is one of two states that established public benefits funding without electric utility restructuring.

Vermont's energy efficiency programs have yielded significant results; through 2006 the energy savings from programs have cumulatively met about 6% of Vermont's electricity requirements. In 2006 efficiency savings were about 1% of 2006 sales. In late 2006 an expansion of programs began, targeting four areas of the state with significant transmission and distribution constraints. With these expanded programs, Efficiency Vermont is planning to achieve an additional 214 GWh of savings and 30 MW of summer peak demand reduction in 2007-2008. These projected kWh savings amount to 3.5% of 2006 sales. In 2007 Efficiency Vermont achieved its highest-ever savings at its most cost-effective yield rate—105 GWh at a levelized annual net resource cost of 2.2 cents per kilowatt-hour. This level of savings is about 1.7% of annual energy sales and is higher than annual load growth, which has been about 1.45%. This means that Vermont has effectively turned its load growth negative—a significant milestone and target yet to be achieved by any other state (other than California during their electricity crisis of 2001).

Vermont pioneered the model of a statewide "energy efficiency utility" (EEU)—an organization supported by public benefits funds and whose primary objective is to provide programs and services to Vermont's energy consumers that provide energy and cost savings to them. The Vermont Public Service Board (PSB) is responsible for overall oversight of the EEU, "Efficiency Vermont," which is run by a competitively selected contractor, presently and since its inception the nonprofit Vermont Energy Investment Corporation (VEIC). PSB also employs a contract administrator, a fiscal agent and an advisory board to provide oversight for Efficiency Vermont. Efficiency Vermont provides a comprehensive portfolio of services and has achieved significant success in meeting program objectives.

Policy Drivers of Program Expansion
A series of legislative and regulatory actions are pushing Vermont to increase its already significant achievements via its energy efficiency programs. In 2005 Act 61 was enacted that removed the cap that had been in place on Efficiency Vermont's annual budget. The Public Service Board subsequently conducted a proceeding to determine appropriate spending levels. The result was an August 2006 Order that established greatly increased program funding—75% above 2005 spending levels. By 2008 Vermont expenditures on electric sector energy efficiency will be $30.75 million per year—nearly double that of 2004. Budget levels for 2009-2011 will be determined by proceedings underway in 2008. Based on the levels of program activity supported by increased budgets, the Vermont Department of Public Service projects nearly zero growth in electric energy consumption for Vermont between 2008 and 2015.

While capturing a higher share of the cost-effective resource potential is clearly a primary driver of these program developments, there are additional drivers working to increase Vermont's energy efficiency goals and efforts. One of these drivers is to an effort that targets specific geographic targets in the state—areas that are forecasted to need costly investments in transmission upgrades in the near future. Programs associated with this initiative are known as Geographically Targeted (GT) efficiency programs. Four areas of the state fall within this initiative, which is using energy efficiency to try to delay or avoid transmission upgrades. Efficiency Vermont is receiving $15-20 million per year for these GT programs.

Another driver for increased energy efficiency is Vermont's participation in the Forward Capacity Market in New England. Efficiency Vermont and Burlington Electric Department (offering parallel municipal utility programs) have bid into this market and will receive about $1 million per year in additional revenues as a result of having won a bid in this market. A final driver is Vermont's participation in the northeast's "Regional Greenhouse Gas Initiative" (RGGI). Energy efficiency programs are eligible to receive funding via allowance auction revenues. Vermont expects to receive about $3.5 million per year from RGGI; final determination of how these revenues will be spent has not yet been made. Some indications are that the Department of Public Service will direct these funds to support expanded low-income weatherization efforts along with energy efficiency programs for unregulated fuels for heating and process use (heating oil, propane primarily).

Policies to Address Utility Disincentives/Incentives Regarding Energy Efficiency

The Vermont Public Service Board has approved an alternate regulation plan for Green Mountain Power that decouples sales from revenues. This plan is in effect (as of February 2007) only for Green Mountain Power; other utilities are not affected and will need to submit separate proposals for similar regulatory treatment.

The Vermont Public Service Board has a performance based contract with VEIC to operate Efficiency Vermont. VEIC is eligible to receive a performance incentive for meeting or exceeding specific goals established in its contracts that would mark and reward superior performance. There also is a significant holdback in the compensation received by the contractor, pending confirmation that contractual goals for savings and other performance indicators have been achieved. In its initial contract (2000-2002), VEIC could earn up to $795,000 over the three year contract period. In subsequent contracts the incentives have been ratcheted up with the intent that incentives should be earned for meeting "stretch goals" indicative of a growing and maturing program.

Strategies and Actions Being Taken to Achieve the New Goals

Vermont planners and program administrators view their new, higher goals as requiring a "Deep Efficiency Acquisition System." Key features and objectives of such a system include:

- A stable program structure—including funding—is the foundation for success. The structure must be based on implementation of standard best practices, including clear roles and responsibilities of all involved parties, rigorous critical evaluation and systems for establishing and maintaining high quality.
- Clear goals and alignment of program mission with these goals.
- Motivation for program administrators that involve appropriate risk/reward incentives.
- Accountability for results—change from a regulatory mindset to a performance mindset.
- Flexibility—the ability to shift program resources and efforts to areas that present best opportunities for meeting overall program goals.

In designing its programs to meet the new challenges it faces with higher savings targets, Efficiency Vermont offers these operating principles:

- Focus on customers, not "running" programs. Customers seek solutions to their energy needs and problems; which programs achieve this do not concern them.
- Invest more heavily in human assistance, not financial assistance. Efficiency Vermont has found that investments in high-quality staff capable of delivering high-quality customer service yielded greater benefits in terms of increased customer participation and resulting energy savings than simply boosting financial incentives.
- Create a vibrant institutional culture within the organizations responsible for program administration and delivery.
- Deep savings will require more complex, multi-faceted strategies and program offerings. Customers will need to enact more comprehensive packages of measures, involving more customized solutions and involving potentially large numbers of partners and market actors.

- Leverage market partners—suppliers, contractors, energy service providers, design professionals, etc. and look for more market-driven opportunities to complement program activities.
- Expect to pay up to avoided cost for new energy efficiency resources. Historically most programs have strived to achieve low costs per saved kilowatt-hour—demonstrating very strong returns on investments, typically much greater than expected returns on alternative supply side investments. Deeper savings will require greater investments—pushing costs per saved kWh higher, but these still can be achieved at costs less than or up to avoided supply costs.