

# **State Public Benefits Policies for Energy Efficiency: What Have We Learned?**

*Martin Kushler and Dan York, American Council for an Energy-Efficient Economy*

## **ABSTRACT**

This paper presents the highlight results of a national study of state public benefits energy efficiency policies and their implementation. Designed as a comprehensive follow-up to ACEEE's initial examination of early public benefits efforts in 2000, the current research revisited those state efforts now that they have been in effect for a half-decade or more.

In this study we found that a total of 18 states currently have specific public benefits energy efficiency programs in operation, with combined annual expenditures of over \$900 million. Key stakeholders in each state (utilities, state agencies, and advocate groups) were interviewed, and they provided qualitative assessments of their state's public benefits policy design and implementation, which were generally very positive. We were able to obtain energy savings results from a dozen of those states, and they reported annual incremental savings of nearly 2.8 million MWh. Cost-effectiveness estimates were available from nine of the most active states, and they showed the programs, in aggregate, to be very cost-effective (i.e., median benefit/cost ratio in the range of 2.1 to 2.5 and median cost of conserved electricity equal to 3.0 cents per lifetime kWh saved). Overall, public benefits energy efficiency approaches appear to be a very successful and cost-effective policy mechanism for achieving energy efficiency.

## **Background**

Over a period of nearly two decades, from the mid-1970s to the mid -990s, public policy in the United States had evolved to establish a major role for electric utilities in advancing energy efficiency. This was done principally under the rationale of "integrated resource planning," whereby vertically integrated electric utilities pursued energy efficiency as one of their "resource options" for meeting electric system needs.

In the mid-1990s, a counter-trend toward "electric industry restructuring" spread through much of the industry, under a philosophy that rejected integrated resource planning and argued that electric supply decisions should be made by the "market." For a variety of reasons (see Kushler & Suozzo 1999; Regulatory Assistance Project 1995), this change in regulatory approach had a serious negative effect on the provision of energy efficiency services by utilities. Total national energy efficiency spending by electric utilities fell by 50 percent from 1994 to 1997 (Kushler & Witte 2000b).

In recognition of the adverse effects of "restructuring" on socially beneficial services such as energy efficiency, policymakers in many states that adopted restructuring also created alternative funding mechanisms to help assure the continued provision of these services. These

funding mechanisms have been generally referred to as “public benefits” (or “system benefits”) policies.<sup>1</sup>

By the end of the 1990s, public benefits funding had emerged to be perhaps the most significant new policy vehicle for energy efficiency in a decade. In recognition of this important development, ACEEE launched in 1999 the first national review of such public benefits energy efficiency approaches, which had been adopted in nearly 20 states. This resulted in the publication in 2000 of a two-volume set of reports cataloging state-by-state policies and summarizing key features, stakeholder reactions, and lessons learned during initial implementation (Kushler & Witte 2000a, 2000b).

Since that time, although the move toward electric restructuring has largely stalled out (no additional states have passed restructuring since 2000, and several have repealed or suspended their restructuring policy), the specific vehicle of public benefits support for energy efficiency has remained remarkably resilient. Every state (18 in all) that initiated public benefits energy efficiency programs continues to operate those programs today. Consequently, the concept of public benefits energy efficiency remains an important policy issue.

As a result, ACEEE launched the current study in mid-2003. The objective of this research was to provide a follow-up national examination of public benefits energy efficiency policies and programs, now that these approaches have been in operation for a fair amount of time (5 years or more in many cases). The central question was: what have we learned about public benefits energy efficiency policies, after a half-decade of experience? The purpose of this paper is to present some of the highlight results of that research.

## Scope

This follow-up research took as its focus the same states that were included in the scope of our original public benefits study published in 2000 (Kushler & Witte 2000a, 2000b). That scope included those states that had formally passed an electric restructuring policy by the end of 1999, plus two states that had passed specific public benefits fund legislation but had not restructured (Vermont and Wisconsin). In all, that sample included 25 states plus the District of Columbia (Arizona, Arkansas, California, Connecticut, D.C., Delaware, Illinois, Maine, Maryland, Massachusetts, Michigan, Montana, Nevada, New Hampshire, New Jersey, New Mexico, New York, Ohio, Oklahoma, Oregon, Pennsylvania, Rhode Island, Texas, Vermont, Virginia, and Wisconsin).

Because it turned out that no additional states have passed electric restructuring or statewide public benefits legislation since our original 2000 reports, that sample continued to be the appropriate group of jurisdictions to use to study the implementation of public benefits energy efficiency policies.<sup>2</sup>

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<sup>1</sup> Public benefits funding mechanisms typically involve the collection of a small per-kWh public benefits surcharge as a part of electric distribution utility revenues. These revenues are used to fund programs administered by utilities or by some designated government or independent organization.

<sup>2</sup> As explained in our original report, there are a number of other non-restructured states that continue to provide utility energy efficiency programs (e.g., Colorado, Florida, Iowa, Minnesota, Washington, etc.) through more traditional regulatory mechanisms, but they are not the focus of this study.

## Methodology

To begin, each of the 25 states (plus D.C.) was re-contacted during the summer of 2003 to gather current information on the status of public benefits policies in their jurisdiction. If there had been any changes in legislation or regulatory requirements since the 2000 study, the pertinent documents were obtained and reviewed. In all states with operating public benefits energy efficiency programs, detailed information was gathered on the administrative structure, funding levels, and implementation results of their public benefits programs.<sup>3</sup>

In addition to the fact-finding interviews and document review, brief telephone interviews were conducted in late 2003 with key stakeholders (utilities, state agencies, and advocate groups) in each state, to obtain their qualitative assessment of their state's public benefits energy efficiency policy design and implementation. These assessments were compared with similar assessments obtained from these same stakeholders in late 1999, when these public benefits policies were in their very early stages of implementation.

## Descriptive Results

The first segment of results to be presented will focus on basic information regarding the policy mechanisms, administrative structures, funding levels, and other descriptive characteristics of the public benefits energy efficiency approaches being taken in the various states.

### Public Benefits Energy Efficiency Policies

Of the 26 jurisdictions addressed in this study, 20 have included specific policies that either require or permit public benefits energy efficiency in their legislation and/or regulatory orders, and 18 of those states currently have such energy efficiency programs in place.<sup>4</sup> (Those states are Arizona, California, Connecticut, Illinois, Maine, Massachusetts, Michigan, Montana, Nevada, New Hampshire, New Jersey, New York, Ohio, Oregon, Rhode Island, Texas, Vermont, and Wisconsin.) Beyond those 18 states, a few additional jurisdictions are still investigating the issue (Delaware, Maryland, and D.C.), while the remainder have shown no indication of including this type of policy requirement.<sup>5</sup>

### Funding

The single most important threshold issue for the establishment of a public benefits energy efficiency policy is to identify the funding arrangement that is going to support the

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<sup>3</sup> The complete report (Kushler, York, & Witte 2004) contains nearly 200 pages of appendices with detailed state-by-state profiles containing this information.

<sup>4</sup> In addition, 17 of those 26 jurisdictions have specific public benefits support for renewable energy (either direct funding or a renewable portfolio standard, or both), and 23 of the 26 include specific public benefits funding for low-income programs (either weatherization/efficiency or bill payment assistance, or both). The complete project report (Kushler, York, & Witte 2004) provides some summary information on these other categories of "public benefits" policies as well.

<sup>5</sup> Again, the scope of this study excludes perhaps an additional half-dozen states that have maintained significant traditional DSM-type energy efficiency programs.

programs. This typically includes at least three components: the funding mechanism; the funding source(s); and the funding amount.

**Funding mechanisms.** The most common approach to funding energy efficiency public benefit programs is a mechanism typically referred to as a “system benefit charge” (or “public benefit charge”). This is a non-bypassable charge on the distribution service (thus being “competitively neutral” because customers pay the charge no matter who their generation supplier is), usually expressed in “mills per kilowatt-hour (kWh).”<sup>6</sup> A total of 12 states have adopted that type of approach.

The other six states have used approaches where the funding is either embedded in rates or provided through a flat monthly fee, rather than a per-kWh charge. Interestingly, two of the 18 states have included approaches that are thus far somewhat unique. Illinois (in addition to a very small requirement for utility funding of some state-administered programs) has established a large “Clean Energy Trust Fund” (funded with \$250 million from Commonwealth Edison as part of a larger agreement on restructuring-related issues) that will be used, in part, for energy efficiency efforts. Texas, in contrast to virtually every other state, did not establish a funding amount but instead established an energy savings performance standard. Texas requires utilities to achieve energy savings each year equivalent to 10 percent of projected load growth. The utilities then submit rate filings to the PUC to cover the estimated costs of achieving those savings goals.

**Funding sources.** One policy concern embedded within the broader issue of funding mechanisms is the question of whether all customers would pay to support these funds or would some customers or customer classes be excluded. The predominant approach for public benefits funding, by far, has been that all customers should pay to help support these programs (in keeping with the principle that these programs produce many “public” benefits). This has also been the notion behind making the rate charges that support these programs “non-bypassable” (i.e., they are paid whether the customer purchases electricity from the utility or some other retail supplier).

Nevertheless, there have been some policy exceptions made. Large industrial customers and their advocates have frequently argued that they do not need or want these “public” programs and therefore should not be required to pay for them. Although a good argument can be made that energy efficiency benefits all customers in a number of ways,<sup>7</sup> these large customers often have significant political clout and in some cases have succeeded in achieving full or partial exemptions. Thus a few states have included some preferential treatment for very large industrial customers (typically those in excess of 1 MW of demand) in their restructuring legislation. For example, Montana provides for a smaller per-kWh charge for customers of 1 MW demand or greater and also allows for “credits” against that charge for documented self-spending on energy efficiency projects. Oregon allows a similar partial credit for large customer (in excess of 1 MW) documented self-spending, plus has a special discounted per-kWh charge for aluminum smelters. Vermont has a provision that allows for a few large customers that meet stringent conditions (including being certified under ISO Standard 14001) to self-direct their own

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<sup>6</sup> One “mill” is equal to one-tenth of a cent.

<sup>7</sup> Examples are environmental benefits from reduced electricity generation; reductions in peak demand that benefit system reliability, general downward pressure on rates from reducing overall demand, etc.

efficiency investments up to 70 percent of the cost they would otherwise pay to support the statewide energy efficiency utility. Despite a few such examples, however, the vast majority of states have required their energy efficiency public benefit funding to come from an equal per-kWh charge applied to all customers.

**Funding amount.** In order to provide common bases for comparison, this research attempted to determine estimates of energy efficiency funding using three standard indices: millions of dollars; mills per kWh; and percent of utility revenue. Typically, a state's legislation and/or regulatory orders might only clearly specify one of those indices, so this project developed estimates of the remaining indicators from other available data (e.g., EIA data on utility sales and revenues, etc.)

The indicator for which we were able to obtain the best information was mills per kWh, and we were able to find or develop estimates of that indicator for all 18 states with currently operating public benefits energy efficiency programs. For those states, the required funding level for energy efficiency ranged from .03 to 3.0 mills per kWh, with a median value of between 1.1 and 1.2 mills per kWh.

Table 1 provides a listing of the level of public benefit funding in each state, expressed in terms of mills per kWh, for each of the three major public benefit areas. (Note that the values in the table only represent funding that was specifically identified in restructuring or public benefits legislation and/or regulatory orders. Some of the states have other miscellaneous ongoing or supplemental funding from other sources—e.g., for low-income programs or additional resource procurement, etc.—which are not reflected in the table. In some cases these additional expenditures are substantial.)

### **Duration of the Public Benefits Policy**

Another key issue regarding public benefit energy efficiency policies has been the length of time for which the policy (and the associated funding) has been required. Here again, there has been quite a bit of variability. In the original 2000 study, we reported that a total of six states did not set any specific duration for the funding requirement, leaving it essentially open-ended; four states set a 10-year funding period; six states specified 5 years; one state set 4 years; and two states set 3 years. We also observed that it was interesting to note that some of the earlier restructuring states tended to specify shorter time periods (e.g., 4 years for California, 3 years for New York, etc.), whereas the more recent restructuring states tended to specify longer or open-ended periods. We commented that this might reflect an emerging recognition that transforming markets to be energy efficient is not a simple or quick process, and that there is an ongoing need for these public benefits programs. There is also a growing recognition that private markets alone are not going to fill this need (Kushler & Witte 2001).

In the current study, we see that the trend toward a longer time period for funding is continuing. No state has terminated its energy efficiency public benefits funding or allowed its funding authority to lapse. Four states that originally specified a short time period (3 to 5 years) have officially extended their public benefits funding for energy efficiency: Montana for an additional 2 years; Massachusetts and New York for an additional five years; and California for an additional 10 years.

**Table 1. Public Benefit Funding Level by State (mills per kWh)**

Total Fund <sup>1,2</sup>			Energy Efficiency <sup>3</sup>			Low Income <sup>4</sup>		Renewable Energy <sup>5</sup>		
state	mills	<sup>4</sup>	state	mills		state	mills	state	mills	
Connecticut	4.05	+	Connecticut	3.00	li	New Hampshire	1.20	Arizona	0.87	p
California	3.00	+	Vermont	2.90	li	Wisconsin	0.85	California	0.80	p
Massachusetts	3.00	+	Massachusetts	2.50	li	Ohio	0.84	Connecticut	0.75	p
New Hampshire	3.00	+	Rhode Island	2.30	r	Maine	0.80	Massachusetts	0.50	p
Vermont	2.90	+	New Hampshire	1.80		Texas	0.65	New Jersey	0.43	p
Maine	2.30		Maine	1.50	li	Oregon	0.63	Oregon	0.31	
Rhode Island	2.30		California <sup>6</sup>	1.30	+	Illinois	0.60	Delaware	0.18	
Oregon	2.20		New Jersey <sup>7</sup>	1.30		Maryland	0.60	New York	0.16	
Wisconsin	2.14		Oregon	1.26		Pennsylvania	0.60	Montana	0.14	
New York	1.75	+	Wisconsin	1.15		California	0.50	Wisconsin	0.09	p
New Jersey	1.73		New York	1.02	+	Michigan	0.40	Pennsylvania	0.05	
Montana	1.10		Montana	0.70		Nevada	0.39	Illinois	0.04	
Arizona	1.07		Nevada	0.43		Connecticut	0.30	Rhode Island	EE	
Texas	1.0	+	Texas	0.33		Montana	0.26	Maine	RPS	
Ohio	0.97		Ohio	0.13		New York	0.26	Nevada	RPS	
Nevada	0.82		Michigan	0.1		D.C.	0.19	New Mexico	RPS	
D.C.	0.80		Arizona	0.06		Delaware	0.18	Texas	RPS	
Pennsylvania	0.69		Illinois	0.03		New Jersey	0.16	D.C.	TBD	
Illinois	0.67	+	Maryland	TBD		Arizona	0.14	Maryland	TBD	
Michigan	0.5		D.C.	TBD				Michigan	TBD	
Delaware	0.36							Arkansas	TBD	
Maryland	TBD	+								

Source: Values in the table are in many cases reported directly in state legislation and/or regulatory orders. In other cases they are estimated using inputs from those sources, interviews with state agencies, and other available data (e.g., EIA data on electricity sales, etc.). Data were not available for all categories of public benefits in each state. **The values in the table are based on authorized funding levels according to the public benefits policy in the state.** They are not adjusted to reflect exact actual spending, which may vary from year to year. They also do not reflect recent temporary funding diversions that have occurred in some states.

Notes: <sup>1</sup> The total is the sum of energy efficiency, low-income, renewable energy, *and* other programs not specifically listed, such as research and development (which is not listed separately in this table, so the totals may be greater than the sum of EE, LI, and RE values).

<sup>2</sup> A plus sign [+] next to a value means that additional funding is available in the state from other sources, due to other government requirements, programs by utilities not covered by the public benefits charge (e.g., Muni's and Co-ops, power authorities), etc.

<sup>3</sup> "li" in right column indicates that some low-income programs are included; "r" indicates that some renewable energy programs are included, and "+" indicates there are other EE programs.

<sup>4</sup> These values still might not capture all low-income program activity in a state as many offer programs through other organizations, such as community action programs, that are not included in our research.

<sup>5</sup> "p" in the right column means there also is a "renewable portfolio standard" in place.

<sup>6</sup> "EE" funding is for public good programs only; it does not include "procurement funding" for additional energy efficiency programs to meet energy resource needs as identified in recent strategic planning.

<sup>7</sup> EE spending includes current year spending; not payments for past standard offer contracts

## **Funding Raids**

One phenomenon that has emerged in the last couple of years has been the occurrence of “raids” on the public benefits funds by a few cash-strapped states trying to balance their budgets. Of the 18 states in our study with operating energy efficiency public benefits programs, a total of four states (Connecticut, Illinois, Ohio, and Wisconsin) experienced some form of actual diversion of a portion of their energy efficiency funds during the past couple years. For the other categories of public benefits funds (renewable energy, low-income programs, and R&D), we also identified a total of four states (California, Delaware, Massachusetts, and Texas) that experienced some form of diversion of funds.

While these events have been disappointing and have caused some legitimate concern in the field, it is important to put this situation in context. As discussed in the previous section, no state has terminated its public benefits energy efficiency funding or allowed their funding authority to lapse, and a number of states have officially extended their funding policy. In general, it would appear that support for public benefits by policymakers in the states that have adopted them remains strong.

## **Administrative Approaches**

As previously observed in the 2000 study, the current research again found a wide variety of approaches being used for the administration of the public benefits energy efficiency programs. Half of the 18 states now rely principally on utility administration of the programs, but half feature some type of non-utility administration, relying on either government agencies (seven states) or independent nonprofit organizations (two states). This represents somewhat of a change over time toward non-utility administration, since in the 2000 study two-thirds of the 18 states were relying on utility administration of the public benefits energy efficiency programs.

However, as was also the case in the 2000 analysis, we cannot conclude that there is any single best approach to administration of these programs. There are good examples of success with each type of approach (utilities, government agencies, and independent nonprofit organizations), and the preferred strategy in any particular state seems to depend very much on the particular situation in that state.

As a final note, it should be emphasized that although it is possible to sort states into broad categories based on the type of organization selected for administration, in reality most states have various elements and features that make their approach somewhat unique from other states. This is still an area where a lot of interesting experimentation is occurring.

## **Qualitative Assessments**

As a part of our original 2000 study, we conducted in-depth interviews with several key stakeholders (utilities, state agencies, and advocacy groups) in each of the states. Among other things, we asked respondents to assign a letter grade to two aspects of their state’s approach to public benefits energy efficiency: (1) the conceptual design of the state approach; and (2) the implementation of that design. The initial ratings of conceptual design were quite positive (nearly 80% rating their state’s approach as either an “A” or “B”). The ratings of implementation were also generally positive, but many respondents assigned a grade of “incomplete.”

In the current study, we went back to the same stakeholder organizations (and wherever possible the same individuals) and asked for their updated qualitative assessments. After 4 additional years of experience, the stakeholder assessments of state public benefits energy efficiency approaches were still generally very positive. The modal “grade” assigned was a “B,” and four-fifths of all respondents assigned an “A” or “B” (to both conceptual design and implementation).

This broad picture of consistent high marks over time does obscure the fact that some current state assessments did move up or down as compared to the original interviews (conducted in late 1999). Five states showed a modest increase in ratings (Massachusetts, New Hampshire, New York, Oregon, and Rhode Island) and five showed a modest decrease in the stakeholder assessments (Arizona, Connecticut, Maine, Ohio, and Wisconsin). These rating shifts are attributed by respondents to various situation-specific factors in the individual states. However, perhaps the single most common factor had to do with funding (i.e., increases in funding for public benefits energy efficiency tended to be associated with increased favorable assessment, and having experienced funding raids was cited by respondents in several states as a factor in lowered assessments by stakeholders).

Despite some fluctuations, however, this overall qualitative assessment suggests that public benefits energy efficiency policies and programs have proven to be fairly popular among key stakeholders in the states that have enacted them.

**Highest graded states.** In order to help protect our sources (who were promised anonymity), and to resist trying to draw too many distinctions with an admittedly limited data set, we intentionally avoid going into detail about individual ratings and don’t try to make direct comparisons between states. However, in our original 2000 report, we noted that for those looking for a good model for state legislation, the most consistently positive ratings for the “on paper” policy were received for Connecticut, Massachusetts, Rhode Island, and Vermont,

Interestingly, in the current project, three of those four states (Massachusetts, Rhode Island, and Vermont) were again noteworthy for their high marks, both for their conceptual policy approach to public benefits energy efficiency and for their implementation of that policy. (Connecticut’s ratings suffered in this follow-up study, particularly because of the funding raid problems they have experienced.)

## **Quantitative Results**

This project sought to obtain data from the states on three key quantitative variables: (1) energy efficiency program spending; (2) savings impacts; and (3) cost-effectiveness. As a general caveat, it should be noted that there is a great deal of inconsistency across the states in terms of whether data is available in each of these areas, and if so, how these data are defined and reported.

**Energy efficiency program spending.** Across all 18 states with active public benefits energy efficiency programs, total actual annual spending on energy efficiency was just over \$900 million (\$924 million) in the most recent year for which data were available (either 2002 or 2003). Individual state spending varied widely, ranging from \$2 million to \$240 million per year, with a median value of about \$19 million. The “average” spending level was much higher (\$51 million), driven by a small group of states (California, Massachusetts, New Jersey, and New



York) that spent \$100 million or more. For states with comprehensive statewide programs, the level of actual spending tended to be in the range of approximately 0.7 to 3.0% of total utility retail revenues. State-by-state data on energy efficiency spending and savings (where available) are provided in Table 2.

**Table 2. Energy Efficiency Program Spending and Savings<sup>1</sup>**

	Budgets		Electricity Savings			Year	Notes
	\$ millions	% of revenues	MWh	% of sales	MW		
AZ	2.0	0.1%	NA	NA	NA	2002	NA = Not Available
CA	240.0	1.5%	933,365	0.8%	103	2003	Based on IOU PGC funding only
CT	87.1	3.1%	246,000	0.8%	98.7	2002	Reflects CT performance prior to 2003 funding raids
DC	—	—	—	—	—	—	D.C. has low-income programs only
DE	—	—	—	—	—	—	No utility or PGC energy efficiency programs; LI and RE only.
IL	2.0	0.02%	NA	NA	NA	2003	Reflects \$1 million decrease due to state budget shortfall
ME	2.9	0.3%	25,500	0.3%	NA	2003	Projected values; Efficiency Maine was created in 2002; 2003 was first full program year and included interim programs; EE includes LI-EE; full EE program budgets to be about \$9 million per year
MD	—	—	—	—	—	—	Low-income only, no EE/RE to date; may begin EE programs 2004; some load management programs still offered—data on them not included here
MA	138.0	3.0%	241,000	0.7%	48	2002	EE includes low-income efficiency improvements
MI	7.8	0.1%	NA	NA	NA	2002	EE only; 88% of LI and EE fund grants have gone for LI programs, including payment assistance.
MT	14.3	2.0%	NA	NA	NA	2002	
NH	5.2	0.5%	12,039	0.1%		2002–2003	Partial-start-up was June 2002—data for 10 months: June 1, 2002–March 31, 2003. Annual savings based on estimates of lifetime savings/15 years.
NJ	99.6	1.5%	171,692	0.2%	242	2002	Includes LI energy efficiency; does not include payments on “standard offer” contracts established in earlier program years
NY	129.0	1.3%	290,000	0.3%	382	2002	Annual data for 2002 estimated used reported cumulative data, 1999–2003
NV	11.2	0.5%	NA	NA	NA	2003	
OH	14.3	0.1%	NA	NA	NA	2002	
OR	19.1	0.9%	112,100	0.4%	NA	2002	Partial year data; programs began March 1, 2002
PA	—	—	—	—	—		Sustainable Energy Fund primarily RE and R&D
RI	16.4	2.7%	50,568	0.8%	14.6	2002	Narragansett Electric data only (~entire state EE program)
TX	69.0	0.4%	455,700	0.2%	135.2	2002	
VT	16.8	3.3%	38,400	0.8%	NA	2002	
WI	49.7	1.4%	214,800	0.4%	35.9	FY 2003	Does NOT include effects from public benefits cuts, which affect FY 2004 and FY 2005 funding cycles
<b>Total</b>	924.4		2,780,254		1,059.3		

<sup>1</sup> Percentages given are based on revenues and sales of utilities affected by public benefits funding requirements.

**Savings impacts.** Of the 18 states with public benefits energy efficiency spending, we were able to obtain publicly reported impact data regarding electricity savings (kWh) from 12 states. Eight of these states also reported demand (MW) savings data from their programs. Not surprisingly, the states that reported these data tend to be the states with the largest programs and the most sophisticated monitoring and reporting requirements.

As the data in Table 2 suggest, savings results are clearly related to the amount of funding and program activity. Annual energy efficiency program savings as a percentage of total electricity sales range from about 0.1 to 0.8% (that is, the amount of new electricity savings achieved from programs in a reporting year expressed as an annual—not lifetime—amount divided by the total reported electricity sales in the state). The mean value for the 12 states for which annual savings data were available is 0.4%. These savings are relatively small compared to total electricity sales when viewed on an annual basis. Over a longer period, however, these savings compound and can be significant since most efficiency measures have lives of ten or more years.

Electricity savings also reduce system demand (MW). The combined total incremental demand savings being achieved each year by the eight states reporting these data was 1,059 MW, the size of one very large baseload power plant or 3 medium-size power plants.

One additional area of savings impacts is the category of environmental impacts. We were able to obtain estimated air emissions reductions from public benefits energy efficiency programs from a total of nine states. That information is summarized in Table 3.

**Table 3. Emissions Reductions from State Energy Efficiency Programs**

State	SO <sub>2</sub> (tons)	NO <sub>x</sub> (tons)	CO <sub>2</sub> (tons)	Mercury (lbs)	Notes
Connecticut	762	234	182,875	NA	2002 annual
Maine	22	6	4,837	NA	2003 interim program
Massachusetts	1,581	791	280,100	NA	2001 annual
New Hampshire	382	76	57,500	NA	2003 start-up period—3 months; annual estimated from reported lifetime (LT/10)
New Jersey	559	265	165,040	5.9	2002 annual
New York	1,115	713	584,000	NA	2002 annual
Rhode Island	124	43	35,306	NA	2002 annual
Vermont	1,461	448	350,667		2000–2003 cumulative/3
Wisconsin	713	446	185,457	4.9	2001–2002 cumulative/2

**Cost-effectiveness.** Information on cost-effectiveness is also inconsistently reported across the states. We were able to obtain reported estimates of cost-effectiveness (either in terms of a benefit-cost ratio or a reported “cost of conserved energy” figure, or both) from a total of nine states. (Again, these tended to be the leading states in terms of the size of their public benefits energy efficiency efforts and the level of sophistication of their monitoring and evaluation activities.)

The available data suggest that these state public benefits energy efficiency efforts have been cost-effective. Overall portfolio benefit-cost ratios reported ranged from 1.0 to 4.3, and lifecycle costs of conserved electricity ranged from \$0.023 to \$0.044 per kWh (see Table 4). It is important to keep in mind the caveats that these are data based on often-differing methodologies and assumptions across the states, and that in this project we did not attempt to reconcile these inconsistencies or conduct our own cost-effectiveness analysis. Nevertheless, the consistent

positive results and relatively consistent numerical results across this many states are encouraging indicators of the success of these state public benefits energy efficiency policies.

**Table 4. Energy Efficiency Program Cost-Effectiveness**

State	Benefit/Cost All Programs	Benefit/Cost Commercial/Industrial Programs	Benefit/Cost Residential Programs	Cost of Saved Energy (\$ per kWh)	Notes
California	2.0 to 2.4			0.03	
Connecticut	NA	2.4 to 2.6	1.5 to 1.7	0.023	
Maine	1.3 to 7.0				Range of ratios for individual programs
Massachusetts	2.1	2.4 to 2.7	1.3 to 2.1	0.04	
New Jersey				0.03	
New York				0.044	
Rhode Island	2.5	3.3	1.5		
Vermont	2.5	2.9	1.8	0.03	
Wisconsin	3.0	2.0	4.3		
<b>Median</b>	2.1 to 2.5	2.5 to 2.6	1.6 to 1.7	0.03	

Note: Median value for the “all programs” column was estimated using assumed value of 2.0 for Connecticut and reported data for Massachusetts, Rhode Island, and Wisconsin. Maine is not included in this estimate because of the wide range of individual program values. Median value for the commercial/industrial programs column was estimated using assumed values of 2.5 for Connecticut and 2.6 for Massachusetts. Median value for the residential programs column was estimated using assumed values of 1.6 for Connecticut and 1.7 for Massachusetts. (Those two states did not report point estimate values for those variables, just the ranges shown.) We developed the median range estimates shown in the last row of the table in order to give a rough indication of overall program cost-effectiveness across this set of states. Readers are advised not to put too much emphasis on these exact figures, but regard them as broad indicators.

## Conclusion

State “public benefits” funds emerged in the late 1990s to become perhaps the most significant new policy mechanism for implementing energy efficiency in the past decade. ACEEE conducted an “initial examination” of experience with this new strategy in 2000, concluding that the policy approach looked promising, but that it was still very early in the process.

Now, with four more years of documented experience in hand, the conclusion that public benefits energy efficiency programs are an effective policy mechanism for achieving significant energy savings (and other related goals) seems very sound.

Public benefits energy efficiency policies have been adopted in at least 20 states, and at least 18 states have currently operating public benefits energy efficiency programs. Despite some notorious “funding raids” in a few states, brought about by severe state budget problems, the qualitative assessment of these public benefits energy efficiency programs by key stakeholders (government, utilities, and advocacy groups) in the states continues to be very positive. In a set of interviews conducted with these stakeholders across 16 states in late 2003, the modal “grade” assigned to their state’s public benefits energy efficiency approach and its implementation was a “B,” with four out of five respondents assigning a grade of “A” or “B.” As further concrete evidence of stakeholder support, no state has cancelled a public benefits energy efficiency policy, and at least four states have passed legislation to substantially extend the time period for which its public benefits energy efficiency policy will be effective.

These public benefits energy efficiency programs are also producing significant energy savings impacts. Annual spending across the 18 states currently fielding programs is over \$900 million. Annual savings in just the 12 states reporting evaluation data are nearly 2.8 million MWh and 1,060 MW (MW savings data were reported by only eight states). We were able to obtain cost-effectiveness estimates from nine of the most active states, and the results show these public benefits energy efficiency programs to be very cost-effective. Estimated benefit/cost ratios range from 1.0 to 4.3, and estimates of the cost of conserved energy range from \$.023 to \$.044 per kWh. Beyond energy savings, we also summarize the significant air pollution emission reductions reported by a number of states.

In summary, the concept of public benefits fund support for energy efficiency has now been well-demonstrated across a large number of states, using a wide variety of different administrative strategies. In view of this collective experience, it would seem appropriate to recommend that additional states, and indeed the federal government, seek to implement such public benefits mechanisms in order to help capture the many benefits of improved energy efficiency.

## **Bibliography**

- Eto, Joseph, Charles Goldman, and Steven Nadel. 1998. *Ratepayer-Funded Energy-Efficiency Programs in a Restructured Electricity Industry: Issues and Options for Regulators and Legislators*. Washington, D.C.: American Council for an Energy-Efficient Economy.
- Kushler, Martin and Margaret Suozzo. 1999. *Regulating Electric Distribution Utilities As If Energy Efficiency Mattered*. Washington, D.C.: American Council for an Energy-Efficient Economy.
- Kushler, Martin and Patti Witte. 2000a. *A Review and Early Assessment of Public Benefit Policies under Electric Restructuring. Volume 1: A State-By-State Catalog of Policies and Actions*. Washington, D.C.: American Council for an Energy-Efficient Economy.
- . 2000b. *A Review and Early Assessment of Public Benefit Policies under Electric Restructuring. Volume 2: A Summary of Key Features, Stakeholder Reactions, and Lessons Learned to Date*. Washington, D.C.: American Council for an Energy-Efficient Economy.
- . 2001. *Can We Just “Rely on the Market” to Provide Energy Efficiency? An Examination of the Role of Private Market Actors in an Era of Electric Utility Restructuring*. Washington, D.C.: American Council for an Energy-Efficient Economy.
- Kushler, Martin, Dan York, and Patti Witte, 2004. *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.
- Regulatory Assistance Project. 1995. *RAP IssuesLetter: System Benefit Charge*. Montpelier, Vt.: Regulatory Assistance Project.
- York, Dan and Martin Kushler. 2002. *State Scorecard on Utility and Public Benefits Energy Efficiency Programs: An Update*. Washington, D.C.: American Council for an Energy-Efficient Economy.