UTILITY ENERGY EFFICIENCY PROGRAMS: A BRIEF SYNOPSIS OF PAST AND PRESENT EFFORTS

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ABSTRACT

Utilities have offered energy efficiency and other *demand-side management* (DSM) programs to their customers for approximately two decades. Programs began in several regions and gradually expanded until by 1993 annual expenditures approached $3 billion and peak demand savings exceeded 20,000 megawatts (MW). Through the mid-1990s, programs gradually shrunk as utilities sought to cut costs in preparation for restructuring. However, as programs shrunk, so did savings, contributing to high demand growth and current reliability problems. In the past few years, as part of restructuring, many states have adopted *public benefit funds* that recognize that programs to save energy, assist low-income households, and promote renewable energy serve important public purposes and should not be a casualty of restructuring. To date, twenty states have adopted such programs and initial results look promising. Based on the success of these historic and recent programs, we recommend that additional states adopt public benefit programs, and that the federal government establish a matching fund to co-fund state public benefit efforts.

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PAST EFFORTS

Utilities have offered energy efficiency and other *demand-side management* (DSM) programs to their customers for approximately two decades. DSM programs began in the late 1970s. Among the first programs were utility energy audit programs, which were begun as part of the Residential Energy Conservation Service established under the National Energy Conservation Policy Act passed in 1978. Around the same time, a more comprehensive set of programs began in the Pacific Northwest in response to tightening regional power supplies and rapidly escalating electricity prices. Shortly thereafter, utilities in California began offering programs in order to provide new resources to meet forecasted growth in energy demand. DSM was then introduced on the East Coast, with programs to address power shortages and public relations problems resulting from the accident at Three Mile Island being particularly prominent. Through the 1980s and 1990s, DSM programs spread to many other regions of the country. Rationales and levels of effort varied from state to state and utility to utility; many of the most common rationales for these programs are noted below.

- Reduce energy use.
- Reduce peak demand and the need for new power plants.
- Reduce customer energy bills.
- Reduce pollution associated with power plant generation.
- Promote local economic development by providing work to local efficiency contractors and through the "multiplier effect" of reduced energy bills leading to increased spending on other goods and services.
- Provide a valued service to customers.
- Reduce the need for transmission and distribution system upgrades.
- Improve public relations for sponsoring utilities and other sponsoring organizations.

As the reach and size of DSM programs grew, these programs came to have a noticeable impact on electricity sales and peak demand, as well as on utility budgets. Table 1 presents nationwide data on DSM spending and savings since 1989, as reported by utilities to the U.S. Department of Energy's Energy Information Administration (EIA). During the 1989-1993 period, annual nationwide spending on DSM programs increased from about $0.9 billion to more than $2.7 billion. Spending in 1993 was about 1.4 percent of U.S. utility revenues from sales. Over the same period, annual energy savings from DSM programs grew to 45 million kilowatt-hours (kWh) (equivalent to 1.6 percent of 1993 U.S. retail electric sales) while peak demand reductions grew to 23,000 MW (equivalent to about 4 percent of U.S. peak electrical demand in 1993).

Table 1. Estimated Utility Demand-Side Management Spending and Savings, 1989-1998

Year	Total DSM Spending[1]		Energy Efficiency Spending		Total Energy Savings[2]	Actual Peak Load Reduction[3]	Potential Peak Load Reduction[4]
	Current Million$	Real (1998) Million$	Current Million$	Real (1998) Million$	Million kWh	MW	MW
1989	873	1,097	n/a	n/a	14,672	12,463	n/a
1990	1,177	1,417	n/a	n/a	20,458	13,704	n/a
1991	1,804	2,089	n/a	n/a	24,848	15,619	n/a
1992	2,348	2,646	n/a	n/a	35,563	17,204	32,442
1993	2,744	3,013	1,608	1,766	45,294	23,069	39,508
1994	2,716	2,913	1,592	1,707	52,483	25,001	42,917
1995	2,421	2,538	1,409	1,477	57,421	29,561	47,029
1996	1,902	1,957	1,052	1,082	61,842	29,893	48,344
1997	1,636	1,653	892	901	57,1935	25,284	41,237
1998	1,568[5]	1,568[5]	913[5]	913[5]	56,866[5]	27,231	41,430

Source: Compiled by ACEEE using data from Energy Information Administration, various years, *U.S. Electric Utility Demand-Side Management 1993-1998*. DOE/EIA-0589(Year). Washington, DC.: U.S. Department of Energy.

Notes:
[1] Total of direct and indirect (administrative, marketing, etc.) costs on DSM programs.
[2] Annual energy savings from all DSM programs. Energy efficiency contributes to about 95 percent of total.
[3] Actual peak load reduction from all DSM measures in operation. Energy efficiency contributes to about 55 percent of total.
[4] Potential peak load reduction from load management programs. This includes load management measures under contract but that were not actually called upon at the time of system peak. Potential peak reduction figures compiled by EIA do not include savings from energy efficiency programs.
[5] Adjusted by ACEEE to include some missing data.

While these programs had a significant impact at the national level, impacts were even more dramatic at the state level in states that actively encouraged DSM efforts. For example, a 1999 review of DSM programs in Massachusetts found that in addition to direct energy savings and energy bill reductions, DSM programs resulted in the following additional accomplishments over the last decade (Boston Edison, NEES Companies, and Northeast Utilities 1999):

1. Increased customer awareness of energy-efficiency opportunities;
2. Greater local availability of efficient products;
3. Better product reliability;
4. Lower prices for premium equipment;
5. Revised designer specifications for new construction;

6. Improved codes and standards;
7. Changed customer purchasing requirements; and
8. Support for local economic development through direct jobs in energy efficiency and also by helping several factories operating in the region.

Similarly, a 2000 report on DSM and other energy efficiency efforts in California by the RAND Corp. (Bernstein et al. 2000) concluded that energy efficiency programs operated since 1977 have:

1. Provided benefits to the state economy of $875-1300 per capita (1998 $);
2. Reduced air pollution emissions from stationary sources by approximately 40 percent; and
3. Reduced the energy burden on low-income households.

IMPACTS OF RESTRUCTURING

In 1994, California became the first state to begin restructuring its utility industry, seeking to give customers a choice of electricity suppliers. Following California's lead, other states began pursuing restructuring. The current status of restructuring in the 50 states is summarized in Figure 1.

Unfortunately, restructuring and retail competition have had an adverse impact on utility energy efficiency efforts for a number of reasons (Kushler and Suozzo 1999). First, in order to prepare for the expected onset of competition, many utilities began cutting discretionary spending, including energy efficiency programs. Second, restructuring generally eliminates rate of return regulation and requirements for integrated resource planning (IRP), replacing these with price caps or some other form of regulation that essentially encourages utilities to increase profits by selling as much electricity as possible.

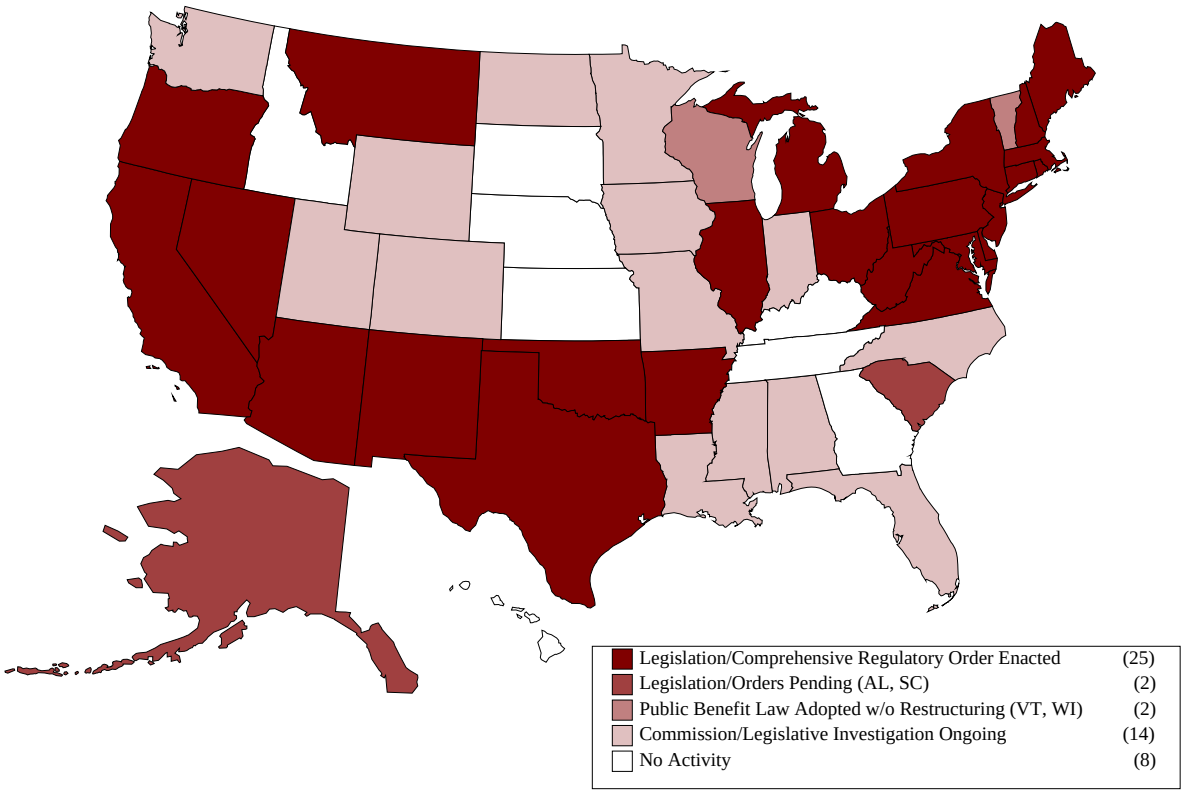
Regardless of the particular motivating factors, the evidence is clear that there were significant cutbacks in utility energy efficiency efforts in the last half of the 1990s. Utility spending on energy efficiency and other DSM programs declined by 43 percent from a peak of $2.74 billion in 1993 to $1.57 billion in 1998 (see Table 1). Trends from 1989 to 1998 are summarized in Figure 2 (EIA data for 1999 are not yet available).

This figure also shows projections of 1998 activity made in 1993, indicating an even larger drop in activity relative to previous plans. This cut in planned DSM contributed to higher load growth during the second half of the 1990s. For example, if 1993 DSM plans were fully implemented, electricity sales in the United States in 1998 would have been about 32,000 billion

kWh lower than they actually were. These lost savings would have helped to reduce peak demand and reliability problems in the past few years, but unfortunately DSM cutbacks prevented this from happening.

Figure 1. Restructuring Status by State as of May 2000

(Number of states in each category shown in parentheses)



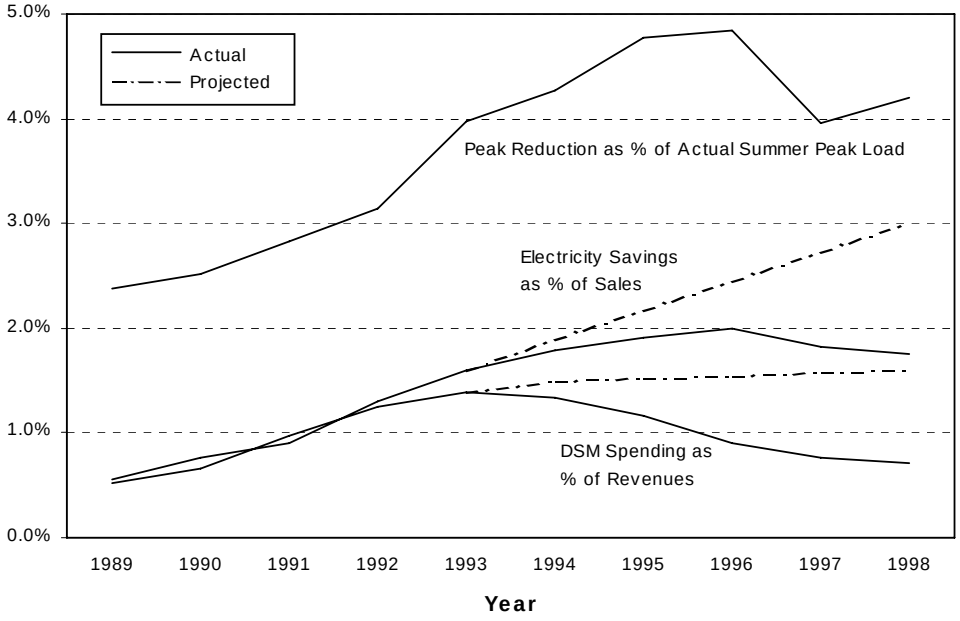
Source: Energy Information Administration. 2000. *Status of State Electric Industry Restructuring Activity as of May 2000*. Web site: www.eia.doe.gov/cneaf/electricity/chg_str/regmap.html. Visited June 2000. Washington, D.C.: U.S. Department of Energy. Enhancements made by ACEEE.

While these figures summarize national trends, they mask the enormous diversity in DSM activity among the states. A recent ACEEE study examined DSM trends at the state level (Nadel, Kubo, and Geller 2000). Data on all the states is summarized in Table 2. The top states including Washington, New Jersey, Rhode Island, Massachusetts, Minnesota, and Oregon dedicated 1 to 2 percent of utility revenues to energy efficiency programs in 1998. In contrast, the weakest states including West Virginia, Alabama, Nevada, Tennessee, Arizona, Michigan, and Pennsylvania dedicated 0.1 percent or less of utility revenues to energy efficiency programs that

year. The top states tend to be concentrated geographically in three regions—the Northeast, upper Midwest, and West Coast. On the other hand, large sections of the Southeast, Midwest, South-Central region, and Southwest demonstrated minimal commitment to utility efficiency programs in recent years.

Figure 2. Trends in Utility Demand-Side Management Programs

Sources: Developed by ACEEE based on data from Table 1 and EIA DSM reports as cited in Table 1.



Note: Projections are the sum of utility forecasts made in 1993.

Not surprisingly, energy savings correlates very closely with energy efficiency program spending. The top spending states were achieving electricity savings equivalent to 3 percent or more of total sales as of 1998, about double the national average. The top five states in terms of energy savings in 1998—Washington, Oregon, Wisconsin, Minnesota, and Rhode Island—saved the equivalent of 6 percent of their electricity sales. If all states and utilities had achieved this level of savings, national electricity consumption in 1998 would have been reduced by about 200 billion kWh, nearly four times actual national savings.

Table 2. State-by-State Spending and Savings on Energy Efficiency Programs between 1993 and 1998

State/Region	Spending as percent of Revenues			Savings as percent of Sales		
	1993	1998	Change from 93 to 98	1993	1998	Change from 93 to 98
New England	**1.97**	**1.37**	**-0.60**	**3.54**	**3.23**	**-0.31**
Connecticut	1.79	0.96	-0.83	4.73	3.31	-1.42
Maine	1.27	1.30	0.03	3.62	0.74	-2.89
Massachusetts	2.55	1.91	-0.65	3.58	3.76	0.19
New Hampshire	0.33	0.41	0.08	0.38	1.31	0.93
Rhode Island	1.98	1.70	-0.28	3.92	4.93	1.01
Vermont	2.48	0.79	-1.69	1.60	4.55	2.95
Mid-Atlantic	**0.89**	**0.60**	**-0.28**	**1.17**	**1.75**	**0.58**
New Jersey	0.29	1.34	1.05	0.31	2.63	2.32
New York	1.66	0.66	-1.00	2.33	2.81	0.48
Pennsylvania	0.16	0.01	-0.15	0.38	0.17	-0.21
E.N. Central	**0.59**	**0.15**	**-0.44**	**0.76**	**1.03**	**0.27**
Illinois	0.02	0.06	0.04	0.04	0.09	0.05
Indiana	0.67	0.04	-0.63	0.21	0.75	0.54
Michigan	0.89	0.05	-0.84	0.66	0.40	-0.26
Ohio	0.38	0.08	-0.31	0.15	0.70	0.55
Wisconsin	2.29	1.02	-1.27	5.10	5.32	0.22
W.N. Central	**0.36**	**0.59**	**0.23**	**0.12**	**1.50**	**1.38**
Iowa	0.62	0.99	0.37	0.31	1.76	1.45
Kansas	0.00	0.00	0.00	0.00	0.00	0.00
Minnesota	1.13	1.16	0.03	0.19	4.94	4.75
Missouri	0.00	0.48	0.48	0.02	0.06	0.04
Nebraska	0.05	0.01	-0.05	0.09	0.06	-0.02
North Dakota	0.13	0.48	0.35	0.13	0.25	0.12
South Dakota	0.04	0.17	0.13	0.07	0.07	0.00
S. Atlantic	**0.63**	**0.29**	**-0.34**	**1.36**	**1.73**	**0.36**
Delaware	0.18	0.24	0.06	0.33	0.94	0.60
Dist. of Columbia	2.22	0.39	-1.83	0.88	2.10	1.22
Florida	0.64	0.54	-0.09	2.71	3.36	0.65
Georgia	0.70	0.02	-0.68	0.25	0.28	0.03
Maryland	1.83	0.80	-1.02	1.17	3.52	2.35
North Carolina	0.31	0.14	-0.16	1.78	0.94	-0.83
South Carolina	0.46	0.17	-0.29	0.93	1.80	0.87
Virginia	0.19	0.00	-0.18	0.26	0.40	0.14
West Virginia	0.09	0.00	-0.09	1.12	0.19	-0.93
E.S. Central	**0.10**	**0.06**	**-0.04**	**1.54**	**0.69**	**-0.85**
Alabama	0.13	0.01	-0.12	0.75	0.11	-0.64
Kentucky	0.06	0.09	0.04	0.07	0.18	0.11
Mississippi	0.01	0.01	-0.01	0.05	0.12	0.08
Tennessee	0.14	0.11	-0.03	4.10	1.88	-2.22
W.S. Central	**0.18**	**0.12**	**-0.06**	**0.62**	**0.84**	**0.22**
Arkansas	0.01	0.01	-0.01	0.07	0.08	0.01
Louisiana	0.04	0.01	-0.03	0.03	0.02	0.00
Oklahoma	0.04	0.01	-0.03	0.28	0.23	-0.06
Texas	0.26	0.17	-0.08	0.91	1.24	0.33
Mountain	**0.70**	**0.16**	**-0.54**	**1.03**	**1.19**	**0.17**
Arizona	0.24	0.11	-0.13	1.32	0.25	-1.06
Colorado	0.40	0.11	-0.29	0.53	1.26	0.73
Idaho	2.78	0.28	-2.50	1.55	2.62	1.08
Montana	1.61	0.72	-0.89	1.25	2.77	1.52
Nevada	0.51	0.00	-0.51	1.57	0.79	-0.78
New Mexico	0.04	0.11	0.07	0.28	0.08	-0.20
Utah	1.60	0.25	-1.35	0.85	2.16	1.31
Wyoming	1.33	0.23	-1.10	0.59	1.89	1.30
Pacific	**2.22**	**0.90**	**-1.32**	**4.54**	**4.91**	**0.37**
California	1.40	0.75	-0.65	4.03	3.00	-1.03
Oregon	2.51	0.96	-1.55	2.33	5.74	3.41
Washington	7.09	1.71	-5.39	6.82	9.24	2.42
P.N.*	**0.10**	**0.63**	**0.53**	**0.15**	**0.60**	**0.46**
Alaska	0.03	0.04	0.02	0.05	0.14	0.09
Hawaii	0.14	0.91	0.78	0.20	0.86	0.66
U.S. TOTAL	**0.83**	**0.42**	**-0.42**	**1.50**	**1.74**	**0.24**

Notes: * Pacific Noncontiguous

CURRENT EFFORTS UNDER RESTRUCTURING

While many utilities have cut their discretionary expenditures, some states have recognized that energy efficiency programs (as well as programs to promote renewable energy and programs to assist low-income families in paying their bills) provide important benefits to the public, and should not be sacrificed as part of restructuring. These states have established to ensure that these programs continue.

As of this writing, a total of 24 states have formally passed an electric restructuring policy, either through legislation or regulatory order. In addition, two states (Vermont and Wisconsin) have passed statewide public benefits funding legislation without adopting restructuring. Of these 26 states, 20 have included specific requirements to support energy efficiency in their legislation and/or regulatory orders (Kushler and Witte 2000a). By far the most common policy mechanism enacted is the use of a small non-bypassable per-kWh charge attached to the distribution service bill (typically called a "system benefit charge" or "public benefit charge"). These surcharges are commonly set based on historic expenditures for public benefit programs. But by transferring the charge to distribution service, the cost is shared evenly by all customers, regardless of which provider they purchase electricity from, whether it be a traditional utility or a new independent provider. The amount of this charge has generally been in the range of 0.5 to 3.0 mills/kWh (see Table 3 for a listing of funding levels by state).[1]

While it is of course too soon to draw firm conclusions about the relative success of public benefit fund policies regarding energy efficiency, the early indications are quite positive. Collection of the fund revenues and actual implementation of the energy efficiency programs has begun in at least ten states, with several states having had their programs "in the field" now for at least two years. Some of these states are briefly discussed below as "case studies."

California

The state of California was unquestionably the most visible pioneer in this area, both for electric restructuring in general, and for the concept of public benefit funding in particular. California was one of the earliest states to pass comprehensive restructuring legislation and also

[1] ACEEE maintains on its Web site (www.aceee.org) a comprehensive state-by-state summary table of descriptive data on public benefits policies and funding. This table is periodically updated in an attempt to keep the best current information available to the public.

Table 3. Public Benefit Funds by State (mills/kWh)[1,2]

Total Fund [c]		Energy Efficiency		Low Income		Renewable Energy	
State	mills [d]	State	mills	State	mills	State	mills
New Jersey	3.76	New Jersey	3.15	New Hampshire	1.50	California	0.80
Connecticut	3.75 +	Connecticut	3.00	Wisconsin	1.30	Connecticut	0.75
Massachusetts	3.70 +	Massachusetts	3.00	Ohio	0.70	Massachusetts	0.70
California	3.00 +	Vermont	2.50	Pennsylvania	0.70	Rhode Island	0.50
Wisconsin	2.90	Rhode Island	2.10	Illinois	0.60	New Jersey	0.45
Rhode Island	2.60 +	Maine	1.50	Maryland	0.60	Oregon	0.30
Vermont	2.50 +	Wisconsin	1.50	Oregon	0.60	New Mexico	0.24 +
Maine	2.30	California	1.30 +	California	0.50	Montana	0.14
New Hampshire	2.00 +	Oregon	1.00	Maine	0.50	Wisconsin	0.10
Dist of Columbia	2.00 –	Montana	0.70	Montana	0.26	Illinois	0.04
Oregon	1.90	New York	0.60 +	New Jersey	0.16	Delaware	0.03
Montana	1.10	Delaware	0.18	Delaware	0.10	New York	0.03
Pennsylvania	0.82	Ohio	0.10	New York	0.10	Pennsylvania	0.02
New York	0.80 +	Pennsylvania	0.10	Texas	0.07	Maine	Dona-tions
Ohio	0.80	Illinois	0.03 +	New Mexico	0.03 +		
Illinois	0.67 +	Arizona	TBD	Massachusetts	Current levels	Arizona	TBD
Maryland	0.60 +	Dist of Columbia	TBD			Dist of Columbia	TBD
Delaware	0.31	Maryland	TBD	Rhode Island	In rates	Nevada	TBD
New Mexico	0.30	New Hampshire	TBD	Arizona	TBD	Vermont	TBD
Texas	0.07 +	Nevada	TBD	Dist of Columbia	TBD		
Arizona	TBD	Texas	TBD	Connecticut	TBD		
Nevada	TBD			Nevada	TBD		
				Vermont	TBD		

Source: Kushler and Witte 2000b.

Notes: [a] Mills = tenth of a cent. This unit is commonly used in the utility sector.

[b] TBD = To be decided.

[c] The total is the sum of energy efficiency, low-income, renewable energy, and other programs not specifically listed, such as research and development.

[d] A plus sign next to a value means that additional funding may be added due to administrative determinations or public utility programs. A minus sign next to a value means that funding will ramp-up to this level but funding in earlier years will be lower.

one of the first to create a specific non-bypassable wires charge to support energy efficiency (and other public benefit purposes as well). California created an initial four-year period for its "Public Goods Charge" (PGC). Implementation of PGC energy efficiency programs began in 1998, and includes a wide variety of energy efficiency approaches. There has been a particular emphasis on market transformation, and in pursuit of that objective there are a number of state-wide programs being coordinated among the major utility companies. The California Board for

Energy Efficiency (CBEE) reported that total electric energy efficiency PGC spending for 1999 was $200 million, with estimated annualized savings of 825 million kWh and 156 MW of peak demand reduction, producing net benefits (benefits in excess of program and customer costs) of about $140 million (CBEE 2000).

New York

New York started its system benefit charge in July 1998. The program is largely administered by the New York State Energy Research and Development Authority (NYSERDA), a semi-independent organization set-up by the state government in 1975. NYSERDA developed a plan calling for about 30 complementary energy efficiency programs addressing different sectors, measures, and market niches. After nearly two years of work, NYSERDA has gotten 25 programs operational, with additional programs set to begin this year. Measures already installed are projected to save consumers and businesses $12.5 million annually, providing a 1.4 year payback on the $17 million spent to date. Furthermore, experience to date is that for each $1 NYSERDA invests, customers, energy service companies, and others are investing $3, providing good leveraging of the public fund. By the end of year three, NYSERDA expects the programs that are already in operation to reduce energy bills by more than $100 million annually, providing an approximately 0.7 year payback on public funds invested (NYSERDA 2000).

Massachusetts

Massachusetts passed restructuring legislation in 1997, which included a public benefit fund (PBF). In Massachusetts the PBF, which began operating in 1998, is administered by distribution utilities, in accordance with plans filed with and approved by state agencies. Energy efficiency programs include a mixture of traditional DSM programs operated by individual utilities and regional market transformation programs in which many utilities from New England hire a single program contractor to serve many utility service areas. In the first year of PBF operation, according to an analysis by the Massachusetts Division of Energy Resources (the state energy office), energy efficiency programs reduced participating customer energy use by 6-13 percent (varying by customer class), saving customers $19 million annually in electricity costs. Over the lifetime of these measures, benefits are projected to be $265 million, exceeding the cost to achieve these savings (including investments by participating customers and the PBF) by about $140 million (i.e., the benefit-cost ratio is over 2:1). Note: these estimates are undiscounted; discounted figures are not readily available (DOER 2000).

Pacific Northwest

The Pacific Northwest provides another model for advancing energy efficiency in a period

of industry restructuring. In the Northwest, the region's four governors (from Idaho, Montana, Oregon, and Washington) convened a special regional working group to conduct a comprehensive review of the Northwest energy system and make recommendations on restructuring issues. Among other recommendations, the report calls for the region's retail distribution utilities to "mount a coordinated effort to transform markets for efficient technologies and practices" and further notes that "because markets invariably cut across utility and jurisdictional boundaries, it makes sense to pursue there efforts regionally" (Steering Committee 1996). As a result of this recommendation, the region's utilities and state policymakers formed a new non-profit organization, the Northwest Energy Efficiency Alliance (NEEA), and gave it a $60 million initial three-year budget to promote energy efficiency in the region by focusing on market transformation. Two of the states (Montana and Oregon) fund their contributions out of PBFs, while the other two states have yet to pass restructuring legislation and fund their share through electric rates.

NEEA is now nearing the end of this initial period and has operated more than 30 regional programs. Among other accomplishments, these programs: (1) established a self-sustaining commercial building operator training and certification apparatus in the region; (2) increased the market share of highly efficient clothes washers from infinitesimal to about 12 percent; (3) catalyzed the development of an energy-saving and productivity-enhancing method for growing silicon crystals; and (4) spread the use of scientific irrigation scheduling that helps farmers achieve substantial water and energy savings (NEEA 1999; 2000). As a result of these and other successes, the region's utilities and policymakers have recently committed an additional $100 million to fund NEEA for five more years (NEEA 1999; 2000).

DISCUSSION

Electric utilities cut their spending on end-use energy efficiency programs by nearly 50 percent between 1993 and 1998. Energy savings and peak demand reductions are also down from mid-1990s levels. But while many programs have been dramatically scaled back, utility energy efficiency programs are by no means "dead" or "dying." Almost $1 billion was spent on utility energy efficiency programs in 1998, and programs are expanding in a few states, due primarily to the adoption of PBFs.

What are some states sacrificing by operating minimal or no utility energy efficiency programs? First, they are maintaining energy waste and higher energy bills for their consumers and businesses. Large-scale utility energy efficiency programs operated in a number of states during the 1990s were very cost effective—saving energy at an average cost of $0.03/kWh or less, well below the cost of supplying electricity (Eto et al. 1995; Nadel and Geller 1996). And the new market transformation program approaches now being used in some states produce savings at less than $0.01 in many applications (Nadel and Latham 1998).

Second, the energy savings resulting from utility energy efficiency programs provide environmental benefits by reducing the need to operate fossil fuel-based power plants—plants that generate 70 percent of the electricity consumed in the United States. These power plants contribute to local, regional, and global air pollution. In fact power plants produce about one-quarter of nitrogen oxides and mercury emissions, more than one-third of carbon dioxide emissions, and nearly two-thirds of sulfur dioxide emissions in the United States (Wooley 2000). Given the regional nature of both power supply and air pollution, utility energy efficiency programs help to cut pollution and improve public health over wide areas—in states with strong efficiency programs as well as in nearby states with minimal programs. Thus, some states are unnecessarily fouling the air while getting a "free ride" to some extent from their more environmentally responsible neighbors.

Third, utility energy efficiency programs often cut peak demand, thereby postponing costly investments in new power plants as well as transmission and distribution system upgrades, and improving power system reliability. System reliability has become a growing concern as facilities age and major cities such as Chicago and New York increasingly experience power outages during summer heat waves. Efficiency programs can reduce air conditioning usage and other loads contributing to peak demand, thereby lowering the risk of these costly, burdensome, and dangerous power outages.

RECOMMENDATIONS

Based on the success of many states in adopting public benefit programs and implementing energy efficiency programs in concert with restructuring, we encourage state policymakers outside the regions where utility efficiency programs have been maintained to adopt public benefit programs and greatly expand their efficiency efforts. This will provide broad benefits through energy bill savings, lower pollutant emissions, and greater system reliability. And it will increase equity among states: for example, air quality and power system reliability will improve if all states (not just those in the Northeast, upper Midwest, and Pacific Coast) operate robust energy efficiency programs.

One federal policy initiative that would likely dramatically improve the chances of energy efficiency public benefit funding in the remaining states is the concept of a "national public benefit matching fund." This trust fund would provide matching funds to states for eligible public benefits expenditures. This concept has been included in several federal restructuring proposals including the Clinton Administration's restructuring proposal and several

Congressional bills.[2] Such a fund would encourage additional states to adopt public benefit programs—thereby increasing energy efficiency and pollution reductions nationwide as well as improving consistency among states. In addition, such a federal matching fund would encourage some states to increase or extend their existing public benefit programs. To be specific, we recommend a surcharge of two-tenths of a cent per kWh applicable to all electricity entering the transmission grid. This amount of funding would allow programs to return to 1993 levels of effort.

A national matching fund would encourage many states to expand their energy efficiency programs without penalizing those states already making a major commitment. Decisions about program design and administration would be left up to state policymakers. ACEEE has previously estimated that a strong federal public benefit trust fund of this magnitude could result in about 340 billion kWh of electricity savings by 2010, 750 billion kWh of savings by 2020, and about $130 billion in net economic benefits for consumers through 2020 (Geller et al. 1999). Based on the historic ratio of DSM energy savings to peak demand savings (EIA 1997), these programs could reduce peak demand by approximately 77,000 MW in 2010 and 170,000 MW in 2020, reducing projected peak demand in 2010 by about 9 percent and contributing to efforts to improve the reliability of the U.S. electric grid during peak periods.[3] Furthermore, this policy could reduce U.S. carbon emissions by 104 million metric tons (MMT) by 2010 and 207 MMT by 2020, thereby making a major contribution to U.S. efforts to limit greenhouse gas emissions and global warming (i.e., these reductions are about 20 percent of the total reduction the U.S. needs to achieve in order to meet the terms of the Kyoto protocol) (Geller et al. 1999).

The success of early public benefit programs indicate what states can do. Now is the time for other states to learn from the leading states, and expand utility and public benefit energy efficiency programs so that their citizens, businesses, and environment can better take advantage of the many benefits these programs bring.

[2] Federal bills with a PBF introduced in the current Congress include bills drafted by Senator Jeffords (S. 1369), Rep. Pallone (H.R. 2569), Rep. Kucinich (H.R. 2645), and the Clinton Administration (S. 1047 and H.R. 1828).

[3] Projected peak demand in 2010 based on NERC projection for 2008 (NERC 2000), extended to 2010 using NERC's projected 1.8 percent annual growth rate.

REFERENCES

Bernstein, Mark, Robert Lempert, David Loughran, and David Ortiz. 2000. *The Public Benefit of California's Investments in Energy Efficiency*. MR-1212.0-CEC. Santa Monica, Cal: RAND Corp.

Boston Edison, NEES Companies, and Northeast Utilities. 1999. *A Decade of Progress with Business Energy Efficiency in New England*. Northborough, Mass.: New England Electric System Company.

DOER [Massachusetts Division of Energy Resources]. 2000. *1998 Energy Efficiency Activities in Massachusetts*. Boston, Mass.: Massachusetts Division of Energy Resources.

EIA [Energy Information Administration]. 1997. *U.S. Electric Utility Demand-Side Management 1996*. DOE/EIA-0589(96). Washington, D.C.: U.S. Department of Energy, Energy Information Administration.

Eto, J., S. Kito, L. Shown, and R. Sonnenblick. 1995. *Where did the Money Go? The Cost and Performance of the Largest Commercial-Sector DSM Programs*. LBL-38021. Berkeley, Calif.: Lawrence Berkeley National Laboratory.

Geller, H., S. Bernow, and W. Dougherty. 1999. *Meeting America's Kyoto Protocol Target: Policies and Impacts*. 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, M. and P. 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.

Nadel, Steven and Howard Geller. 1996. "Utility DSM: What Have We Learned? Where are We Going?" *Energy Policy* 24 (4): 289-302.

Nadel, Steven, Toru Kubo, and Howard Geller. 2000. *State Scorecard on Utility Energy Efficiency Programs*. Washington, D.C.: American Council for an Energy-Efficient Economy.

Nadel, Steven and Linda Latham. 1998. *The Role of Market Transformation Strategies in Achieving a More Sustainable Energy Future.* Washington, D.C.: American Council for an Energy-Efficient Economy.

NEEA [Northwest Energy Efficiency Alliance]. 1999. *1998-1999 Progress Report*. Portland, Ore.: Northwest Energy Efficiency Alliance.

———. 2000. "Northwest Utilities to Invest $100 Million in Energy Efficiency Through a Regional Alliance" Press Release. Portland, Ore.: Northwest Energy Efficiency Alliance.

NERC [North American Electric Reliability Council]. 2000. *Reliability Assessment 1999-2008*. Princeton, N.J.: North American Electric Reliability Council.

NYSERDA [New York State Energy Research and Development Authority]. 2000. *New York Energy $mart Program Draft Evaluation and Status Report*. Albany, N.Y.: New York State Energy Research and Development Authority.

Steering Committee. 1996. *Comprehensive Review of the Northwest Energy System*. Portland, Ore.: Northwest Power Planning Council.

Wooley, D.R. 2000. "A Guide to the Clean Air Act for the Renewable Energy Community." *REPP: Issue Brief* (15). Washington, D.C.: Renewable Energy Policy Project.