Funding for Energy-Related Public Benefits

Needs and Opportunities With and Without Restructuring

A Report to

The Governor’s Office of Energy Conservation

May 1999
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*The Appendix includes corrections made 27 May 1999*
Funding for Energy-Related Public Benefits:
Needs and Opportunities
With and Without Restructuring

1. Introduction

This report addresses the status and future of Colorado policy toward environmentally sustainable energy resources and technologies. It is being provided at a time when the state’s Electricity Advisory Panel is considering these matters as part of its study of electricity restructuring. Senate Bill 98-152, signed into law in 1998, created the Panel to assess all aspects of the possible introduction of retail competition into the Colorado electric supply system. A report on Socio-Economic and Legal Issues was prepared to aid the panel in its assessments and recommendations (Feiler 1999). While the present report is a stand-alone study, it may be read as a complement to the Feiler report, providing additional detail and breadth in the area of sustainable energy resources and their funding. The focus here is on programs that do or would receive funding from distribution utility ratepayers.

We are concerned with both demand-side energy efficiency resources and renewable energy resources. Energy-efficiency resources are measures that substitute for energy supply at the point of end-use consumption. They increase the productivity of energy use. Thus, they encompass a very wide range of technologies --more efficient appliances and equipment of every sort, building shell measures, the design of heating, cooling, and other energy-related system in buildings, energy management controls and systems, and cost-effective fuel substitution. Renewable energy refers to non-nuclear resources that displace fossil-fuel-fired electric generation, thus reducing resource depletion. Renewable resources include wind power, photovoltaic cells, solar thermal systems, hydropower, landfill methane, other biomass conversions, and fuel cells.

One of the 1998 law’s provisions directs the Electricity Advisory Panel to assess "the potential impacts of market-based retail competition on the development of renewable sources of electricity supply, energy efficiency programs, and environmental issues and programs…" (SB 98-152, Section 1.(3)(d)). Consistently with this provision, the subsequent research commissioned by the EAP includes consideration of whether:

“programs such as renewable energy resources, energy efficiency, environmental programs, and research and development programs may be funded through a fee that is collected based on distribution service.” (EAP RFP, Task E, Subtask (b).)

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1 When used to provide heat directly rather than generate electricity, solar thermal systems are sometimes considered to be “energy-efficiency” resources.
Such distribution-level fees to fund publicly beneficial energy programs have been called public benefits charges, system benefits charges or societal benefits charges (SBCs), and other names. To conform with the nationally most widespread practice, this report employs the acronym SBC to denote such a fee or charge.

1.1 SBCs With and Without Restructuring

About twenty jurisdictions have thus far given active consideration to SBCs as a way of supporting sustainable resource programs, so that their benefits are not lost in the transition to a restructured industry. In a regulated environment, such programs have typically been carried out –or proposed to be carried out– by utilities. This report provides a comprehensive, up-to-date summary of all SBC policies in existence as well as most that are under active consideration. It also analyzes the issues involved in establishing and implementing SBCs.

In several cases special provisions have been developed or proposed to support energy-efficiency programs targeted to low-income households. In addition, public benefit research and development (R&D) activity has been included in some SBC systems. Low-income efficiency and public benefit R&D issues are explored briefly here.

In some cases a companion policy to the SBC, a portfolio standard requiring competitive energy suppliers to provide a minimum portion of the energy they sell from renewable or efficiency resources has been adopted or is under consideration. Portfolio standards can be an indirect method of funding the same resources that SBC systems can support. For this reason, portfolio standards provisions are reviewed here as well as SBCs. The table below summarizes the SBC and renewable portfolio standard policies established in the seventeen states that had advanced furthest in restructuring, as of April, 1999.
Most jurisdictions have considered SBCs in the context of policy options related to the introduction of retail competition. However, the linkage between the SBC and retail competition is more a historical than a necessary one. In fact, an SBC approach could usefully be employed whether or not the electricity industry is restructured. Doing so could reduce fluctuations in support for efficiency and renewables in an environment with full regulation of retail electricity services. Consider the fact that funding for efficiency and renewable resources has been quite variable in jurisdictions without retail competition, or before its introduction. Colorado itself is a case in point. This report describes the recent history of efficiency and renewable programs in the state, detailing the very considerable variation in the level of support for them.
An SBC approach can effectively be combined with integrated resource planning in a fully regulated context. It can provide minimum levels of support for the targeted resources. The stipulated support levels could then be exceeded as required to attain an optimal resource plan. This approach is in place in at least one jurisdiction, Minnesota, whose policy framework is included among the jurisdictions encompassed by this study. System benefits charge approaches, and resource portfolio standards as well, can be highly appropriate policies in the present regulated, vertically integrated electric utility industry structure in Colorado.

1.2 The Public Benefits of Sustainable Energy Resources

Why should policymakers be concerned with programs to support sustainable energy resources? The reason is that such programs can provide clear public benefits that would not flow without them.

Colorado’s demand for both electricity and other forms of energy is growing rapidly. There is clear evidence that there remain substantial opportunities for development of the energy efficiency services and products market and for accelerating the penetration of cost-effective technologies that reduce electricity consumption and demand (Nichols 1998). Indeed, with the growth in energy demand, the lost opportunities for saving energy may well be growing.

The 1996 study *Colorado's Energy Future* developed an "alternative energy scenario" including energy efficiency and renewable energy technologies above and beyond expected levels. The authors' study found that implementing this alternative energy path statewide would reduce energy costs for the residential, commercial, and industrial sectors combined. This substantial total net savings was projected even though the renewable energy technology portions of the scenario add to net energy costs. Cumulative savings through the year 2010 would be over $2.5 billion (Laitner 1996, page 25).

A second generation of energy efficiency initiatives could tap these cost-effective opportunities to save energy and reduce the growth in demand. Reinvigorated energy efficiency initiatives can reduce pressures on the electric system, improving reliability and deferring the need for construction of transmission capacity. They can reduce household and business energy bills and benefit the environment. Further, if such renewed programmatic attention to energy efficiency is well designed and is sustained over several years, it can help to further develop the energy efficiency product and services market. It can help develop a more robust market for user-paid investments in energy efficiency, contributing to market transformation for the long run.

The public benefits of renewable energy are primarily environmental. Resources like solar and wind energy can provide clean energy with very limited environmental impacts. In Colorado, with its heavily coal-based electric generation system, use of renewable
energy to generate or replace electricity can reduce the environmental impacts of drilling and mining, conserve water resources, and cut emissions of harmful air pollutants.

In its 1997 report, the Governor's Renewable Energy Task Force estimated that if a fee of 0.5 mills/kWh were collected for just four years, the resulting investment in additional renewable energy technologies could yield 240 MW of new renewable electric generating capacity. The Task Force assumed investment in a mix of commercially available and emerging renewable energy technologies (RETF 1997, page 119).

Other jurisdictions have given policy weight to the fact that both efficiency resources and renewable energy help reduce the non-economic (“external”) costs of energy supply and utilization. Sustainable energy resources have low or no air emissions, one of the reasons why they have come to be called “sustainable.” Their use reduces air pollutants that are harmful to human health. Sustainable resources also cut the emission of greenhouse gasses, reducing levels of carbon in the atmosphere and thereby contributing to the environmental security of future generations. Indeed, should a lower price for electricity result from a retail competition regimen, price elasticity effects will tend to increase electricity use, along with the associated environmental and health impacts. In order for a competitive electric market to take account of environmental externalities and sustainability in a direct and active way, specific environmental, health, and economic policies must be put in place such that the market will work efficiently within these policy constraints.

1.3 The Impact of Restructuring on Sustainable Energy Technologies

In states that have introduced SBC funding for efficiency or renewables, policymakers have concluded that restructuring would not—at least not for a time—create favorable conditions for accelerating the market penetration of efficiency and renewables. Indeed, the extent to which more competitive electricity markets will support these types of technologies is quite uncertain, though U.S. experience with retail competition is still in its very early stages.

Experience with restructuring to date has not evidenced positive effects. With respect to efficiency, for example, Steve Nadel examined energy restructuring in various contexts: natural gas deregulation in the U.S., electricity restructuring in Norway, and electricity and gas privatization in Britain. His finding was that:

“In many cases energy efficiency initiatives have been scaled back following restructuring. In none of the case studies have utility or market-driven energy efficiency investments flourished following restructuring.”

(Nadel 1996.)

Anecdotal evidence suggests that, during the late 1990s, U.S. energy service providers are increasingly offering comprehensive services, whereby energy users may combine efficiency and other services with energy supply contracts. This development appears to
be occurring primarily, though not only, in the jurisdictions that have decided to move to retail competition in electricity supply. But these services are not available to all customers, and it is not clear whether they are increasing net level of market-based efficiency services selected by energy users.

To the extent that they can compete, independent energy service companies (ESCOs) that offer demand-side services only are likely to focus their efforts on larger customers, for whom transaction costs are relatively lower. They may also focus on the most easily-accessible efficiency savings (“cream skimming”). Unless they can obtain financing for energy efficiency projects from utilities or other sources, ESCOs’ market niches will tend to be limited by such factors. A recent study of markets in New York and Wisconsin confirms that ESCOs have had only limited success in taking up the slack in the market created by utilities reducing their efficiency investments, finding that ESCO activity continues to be focussed in the market segment comprised of large municipal and other government facilities, universities and school, hospitals, etc. (the “MUSH” market), with little activity in other commercial-industrial markets, and none in small business and residential markets (Easton 1999).

A major impediment all energy service providers face is that, in practice, the market for many energy efficiency measures is not yet mature, relative to the market for supply-side resources. There are several market barriers and transaction costs that limit the extent to which energy efficiency measures will likely be adopted in a more competitive electricity market. Retail customers --particularly small customers-- continue to face market barriers in terms of financing, access to technical information, rapid payback requirements, and low priority being given to electricity bills. The persistence of these barriers in today’s Colorado market is documented in a recent report (Nichols 1998).

Nor does restructuring create a business incentive for distribution-level utilities (“DISCOs”) to promote demand-side efficiency. Absent such policies as SBC implementation, DISCOs are unlikely to provide energy efficiency services to their customers, because distribution customers are captive and efficiency services do not provide the company with a clear competitive advantage. Additionally, distribution companies are likely to face financial barriers to implementing DSM, because of the potential for lost revenues when customers conserve energy.

With respect to new renewable energy resources, it is also uncertain how much the market will yield. Certainly, there are some customers willing to pay something more for electricity supply that is certified to be environmentally benign, as suggested by the “green pricing” programs in Colorado that are discussed later in this report. Survey results suggest that the potential is large, but actual programs to date have produced slight results. More experience is necessary before it is clear to what degree voluntary programs such as green pricing by themselves can adequately promote development of new renewable resources, as opposed to

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2 The discussion here assumes retail competition. If competition were limited to the wholesale level, then distribution companies could have an important role in developing efficiency resources to lower the overall cost of electricity to the retail customers, as under an IRP framework.
simply channeling existing or likely resources to the greener consumers. If there is an incremental contribution as these programs develop, it is likely to be very small. This small potential does not imply these programs are undesirable, but it has led policymakers in many jurisdictions to consider approaches that can lead to more robust contributions to incremental development of renewable resources.

It is considerations like those just summarized that have led many jurisdictions that are restructuring their electric (and gas) industries to consider making special provision for the financial support of efficiency and renewables through SBCs and portfolio standards. Energy efficiency is considered to offer many important benefits in terms of lower total costs for electricity, improved electricity services, reduction of environmental impacts, and local job and economic development opportunities. Renewable resources are promoted to accelerate their longer-term development and commercialization -- the increased use of renewables in the short term results in a viable and stable market for renewables developers, who can subsequently begin to benefit from economies of scale, which in turn reduces the costs of renewable resources and results in greater penetration. The objective is that well before the non-renewable fossil resource base has been depleted and fossil fuel prices rise sharply, renewable electricity resources will progress to the point that they can provide abundant quantities of electricity at relatively low cost.

Another concern among policymakers in jurisdictions considering retail competition has been with the possible deleterious effects of restructuring on low-income energy consumers. Restructuring raises issues of the overall level of rates, the provision of universal and affordable service, energy bill assistance programs, consumer protection, and energy efficiency services (Brockway 1998). This report is relevant to the last of these issues, low-income energy efficiency, and how it can be addressed by policy. Note that the consideration of policies for promoting efficiency in the low-income housing stock, though highlighted by restructuring, it is just as relevant in a regulated environment such as still exists in Colorado at this writing.

A final concern has been with the fate of public interest R&D in a restructured energy industry. In a regime of vertically integrated utilities enjoying cost of service regulation, there is a long-run rationale for contributing to R&D that aims to develop new energy supply, distribution, or efficiency technologies. Policymakers in some jurisdictions have concluded that retail competition would bring a decline in the breadth or extent of R&D, and have included R&D support in their SBC systems.

1.4 Plan of the Report

The next section of this report reviews the history of efficiency and renewable programs in Colorado over the past decade, and the present situation. Section 3 surveys jurisdictions in which multi-year funding structures to support efficiency or renewables have been adopted or are under active consideration at this writing. Section 4 analyzes the details and choices that must be addressed by policymakers deciding upon what funding programs, if any, are appropriate to support sustainable energy resources. Section
5 brings together recommendations regarding how Colorado might best proceed, with or without restructuring.
2. Efficiency and Renewable Energy Trends--Colorado

The recent history of Colorado policy toward environmentally sustainable energy resources and technologies provides a context for assessing the future role of an SBC approach in the state. The review provided here encompasses energy efficiency, low-income energy efficiency, and renewable energy.

2.1 Energy Efficiency--PSCo

The Public Service Company of Colorado (PSCo) serves about two-thirds of the state’s electricity consumers, and has been the vehicle for most programmatic support for efficiency in the state during the past decade. The integrated resource planning (IRP) process has been the context for PSCo’s demand-side efficiency role. IRP provides a framework for an energy distribution company providing energy supply on a monopoly basis to develop a portfolio of short-run and long-run resources that minimizes the total costs of energy services in the region served. A hallmark of IRP is the incorporation of demand-side management options along with energy supply resources in the shaping of an optimal resource plan. An electric utility using IRP evaluates the full range of resource alternatives in order to provide adequate and reliable service to its electric customers at the lowest cost, while taking risk factors and environmental externalities into account. By considering the consumers’ demand for the services that energy provides, a variety of alternatives to meet those demands can be evaluated. Installed on the customers’ side of the meter, demand side management (DSM) options can include load control, energy-efficiency, or other technologies that shape the extent and timing of end-use demand, while delivering the same end-use service (heat, light, etc.) as without DSM.

Under Colorado’s current regulations, utilities that come under the jurisdiction of the PUC are required to submit a 20-year IRP every three years (CPUC 1996). The IRPs forecast future demand, evaluate options for meeting demand, define the reserve margin requirements, explore transmission capacity needs and describe the environmental impact of proposed resources over the planning period.

In 1989, PSCo conducted a pilot DSM bidding program to test the waters for this approach to promoting demand-side energy efficiency in the market. In 1990, the Company received authorization from the Public Utilities Commission to conduct a bidding program to reduce electric demand by up to 100 MW. This program proceeded in two 50-MW blocks, known as Bid 1 and Bid 2. The Bid 1 RFP was issued at the end of 1990 and led to 30 signed contracts with either energy service companies or customer bidders. Bid 1 was completed in

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3 The mix of supply side and demand side options that provides end-use energy needs over the planning time period at the lowest Total Resource Cost constitute the least-cost plan. The Total Resource Cost (TRC) perspective encompasses all of the economic costs of meeting energy needs, including the additional cost of demand-side measures to save energy (whether those costs are borne by the utility or the customer).

4 Unlike such blocks in other jurisdictions’ DSM bidding programs, these MW could come from summer or winter peak reductions. Thus the total reduction that was expected in the system (summer) peak was much less than 100 MW.
The Bid 2 RFP for the remaining 50 MW was issued in 1992 and was completed at the end of 1996. In 1997, the Company issued a smaller bid, Bid 3, better known as “Bid 2000”.

A wide variety of measures were eligible for inclusion in proposals under the Bid 1 and Bid 2 solicitations --fuel switching away from electricity, as well as installation of electric energy efficiency and load control measures. The smaller Bid 2000 was limited to lighting measures and high efficiency chillers. In 1998, as part of its 1996 IRP settlement, PSCo agreed to issue additional solicitations for DSM measures in 1999 (CPUC 1998a). The new RFPs aim to cumulatively reduce the utility’s system peak demand by about 25 MW. Two of the new solicitations apply to measures previously targeted: one for small commercial and industrial lighting efficiency, the other a custom bid program for all cost-effective efficiency measures. The third new RFP solicits a residential central air conditioning load control program.

In addition to the DSM bids, PSCo operated several utility DSM programs from about 1992 through 1996. Residential programs promoted efficient lighting, switching from electric to gas dryers, and low-cost space and water heating measures. Commercial/industrial programs promoted efficient lighting, efficient motors, heating-ventilating-air conditioning (HVAC) measures, and industrial process energy use, using both prescriptive (fixed) and custom (calculated) rebates (and performance contracting for federal customers); a specific program for new construction; and the Denver International Airport program to install gas engine driven chillers. Savings from these initiatives as reported are substantial, though on a cumulative basis the savings from the bidding programs are larger. The 1997 electricity savings from PSCo’s DSM activities through 1997 were reported to be as follows by the company:

<table>
<thead>
<tr>
<th>Energy (kWh)</th>
<th>Peak Demand (kW)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Summer</td>
</tr>
<tr>
<td>316,182,000</td>
<td>65, 850</td>
</tr>
</tbody>
</table>

These results are totals based on evaluations for specific programs as reported by the Company (PSCo 1998a). For all DSM through early 1999, the cumulative reduction in summer peak demand is estimated to be about 75 MW. Not included are the low-income residential program, for which savings were not estimated, and another program for which the evaluation was not complete. Most programs were found to be cost-effective from a total resource cost perspective, while a few were not. Sixty-nine percent of the energy savings, 54 percent of the summer peak savings, and 46 percent of the winter peak savings came from DSM Bids 1 and 2. The balance came from utility-operated DSM programs.

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5 PSCo has also maintained a program of interruptible rates for large volume customers. Interruptible rates can shift loads and effectively reduce peak capacity requirements. As interruptible rates do not promote greater levels of ongoing energy efficiency in the market, they are not treated further here.

6 Personal communication, Mr. Tom Carter, PSCo, February 1999.
In addition to these substantial energy resource savings from measures installed as a direct result of PSCo DSM initiatives, one must also consider the indirect savings from market development impacts. If DSM transforms a market for energy efficiency products and services, then once DSM marketing and incentives are phased out in that particular market, it should continue to sustain a greater ongoing level of investment in energy efficiency. According to a recent report to the Governor’s Office of Energy Conservation, PSCo’s DSM through 1996 may have produced two types of market transformation (Nichols 1998). First, DSM increased the market penetration of efficient lighting technologies for both new construction and retrofit activities, and in the new construction areas these market effects appear to be continuing without DSM incentives. Second, DSM increased customer familiarity with and use of performance contracting, an approach that provides some type of guarantee of energy savings to a customer and often allows for positive cash flow financing through a lease arrangement.

Yet despite the large energy savings and some evidence of market transformation effects, that report to OEC pointed out that “the overall amount of energy efficiency products and services being delivered in the Colorado market declined significantly post-1996” (Nichols 1998, page 1). Most of the energy service provider businesses that participated in PSCo’s First and Second DSM bids experienced decreased business in their energy efficiency services after their quota under the bids was complete. Most importantly, substantial opportunities for development and implementation of energy efficient technologies still exist in PSCo’s service area —opportunities that could cost-effectively contribute to reduced electricity consumption and demand.

Figure 2.1 shows PSCo’s total DSM expenditures from 1991 through 1997. Spending grew from very low levels to $15.7 million in 1996. Spending then plummeted to $4.65 million in 1997, reflecting the wind-down of Bids 1 and 2 and the termination of most utility-operated DSM. Spending fell further in 1998. The decline after 1996 does not reflect the Company’s resource requirements, which have continued to grow, but rather the Company’s policy perception in 1996-7 that DSM would come to a conclusion. That policy was based on the view that retail competition was imminent and would eliminate the need for DSM. The 1998 IRP settlements described above then gave rise to new DSM bidding programs, though they fall well below the levels of the mid 1990s.
2.2 Other Energy Efficiency Initiatives

Besides PSCo, the other investor owned utility regulated by the Commission is West Plains Energy, a part of Utilicorp that has a small Colorado service area. As part of its IRP process, WPE rolled out a DSM program in November of 1998. Most of the 1999 budget (approximately $300,000) was to go toward new commercial and industrial efficiency activities. The utility planned to solicit projects from customers several times a year. In the first solicitation, 15-20 projects were submitted to West Plains Energy and were under review at this writing. Utility incentives were to be provided to projects meeting solicitation requirements. As in PSCo’s solicitations, projects needed to be cost-effective from the total resource cost (TRC) perspective to qualify for incentives. In addition to the commercial/industrial solicitations, a DSM program focused on efficiency improvements for low-income households and was initiated late in 1998. A residential lighting program was also scheduled to begin early in 1999.7

In addition to its IOUs, Colorado has a number of municipal electric systems and rural electric cooperatives. Several of these utilities have pursued a variety of efficiency initiatives during the past decade.

2.3 Low-Income Energy Efficiency

Low-income households receive energy-related assistance and weatherization benefits from the Low Income Energy Assistance Program8 (LEAP), the Colorado Energy Assistance Foundation (CEAF), and the Energy Saving Partners (ESP) Program. LEAP, with supplemental support from CEAF, focusses on assistance in meeting energy bills, particularly winter heating bills. Though there is some support for energy conservation through LEAP and CEAF, the primary source of investment in energy efficiency in the low-income housing stock comes from the ESP Program.9

Energy Saving Partners Program (ESP)

Colorado renamed the national Weatherization Assistance Program in 1996 to be the Colorado Energy Saving Partners Program (ESP). The program is structured to reduce the financial burden of household energy use through weatherization projects that increase the efficiency of space heating, lighting, and water heating. ESP is designed to provide low-income households with cost-effective energy conservation services. Through weatherization, this program has resulted in 15-20% reductions in participant energy use for space heating due to weatherization, thus reducing these households’ utility bills. Each ESP project must have a minimum benefit-to cost ratio of 2 to 1.

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7 Matt Daunis, WPE, personal communication, January 1999.
8 Nationally and in other states, this program is known as the Low Income Heating and Energy Assistance Program, or LIHEAP.
Depending on the year, between one-quarter and one-third of the funding comes from PSCo. The rest is from federal sources. As shown in table 2.1 below, funding sources include fund transfers from the LEAP program. PSCo was committed to fund E$P through 2001 with $2.6 million each year. In 1996-1997, total funds available were $7.7 million and had been projected to be $8.0 million the next winter.

Most of CEAF’s funding is spent on direct low-income bill payment assistance through the federal LEAP program and the Emergency Assistance Program, but some is used for weatherization and energy education. In 1996-7, $68,000 was provided through special purpose grants for weatherization and energy education. Some support is given to the Youth Alternatives Energy Project, which is funded and sponsored by the Governor’s Office of Energy Conservation. At-risk youth are employed to provide improvements in their neighborhoods including weatherization, conservation and energy education.

<table>
<thead>
<tr>
<th>Funding Source</th>
<th>1996-1997 Funding Level</th>
<th>1997-1998 (Projected)</th>
<th>Type of Funding</th>
</tr>
</thead>
<tbody>
<tr>
<td>Department of Energy</td>
<td>$2,672,997</td>
<td>$2,889,269</td>
<td>Federal</td>
</tr>
<tr>
<td>LEAP Transfer</td>
<td>2,738,670</td>
<td>2,348,964</td>
<td>Federal</td>
</tr>
<tr>
<td>Petroleum Violation Escrow</td>
<td>146,536</td>
<td>245,047</td>
<td>Federal</td>
</tr>
<tr>
<td>Public Service Company</td>
<td>2,100,000</td>
<td>2,600,000</td>
<td>Ratepayer</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>7,658,203</strong></td>
<td><strong>8,083,230</strong></td>
<td>Federal + Ratepayer</td>
</tr>
</tbody>
</table>


### 2.4 Renewable Energy—Resource Characterization

Colorado’s electric generation system is coal-based, but about 6 percent of electric generation is provided from hydropower resources. Development of new hydropower resources is problematic from an environmental impact standpoint. As a practical matter, by far the greatest new renewable energy resource potential in Colorado lies in wind energy. Other renewable resources that could potentially provide electric generation include solar photovoltaic cells, solar thermal electric, biogas, and geothermal energy.

The technical potential for renewable resource generation has been estimated at 182,000 MW, mostly from wind (Freeman 1997). This estimate does not take account of economic and environmental constraints on resource development, but it does suggest the sheer magnitude of the physical resource potential in Colorado.

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At a more practical level, the 1996 study *Colorado’s Energy Future* evaluated an alternative energy scenario that would implement over 1000 MW of renewable resources by the year 2010. The mix of renewable resources in that scenario, dominated by wind, would cost more than conventional electricity at first, but fall below the cost of conventional resources before the end of the analysis period (Laitner 1996, p. 99).

In its 1997 report, the Governor’s Renewable Energy Task Force stated that “Colorado has better wind and solar resources than any other state except Texas, a state more than twice as large” (RETF 1997, page 1). The Task Force considered Governor Romer’s 1996 goal of adding 250 MW of renewable resources to be quite attainable, and outlined numerous recommendations to promote the development of renewable resources in lieu of electricity and other fuels.

Programs being undertaken to promote development of Colorado’s renewable energy resources in 1999 are discussed next. The focus is limited to initiatives in the electric utility sector.

### 2.5 Renewable Energy Initiatives

**Public Service Company of Colorado**

Colorado’s PUC has used the IRP process to prod regulated utilities to evaluate the costs and benefits of windpower. Pursuant to the PUC’s 1998 order approving a settlement on PSCo’s 1996 IRP, the utility is conduct separate solicitations for 25MW of wind capacity and up to 15.5 MW of non-wind renewable energy. These solicitations represent the first substantial acquisitions of wind resources or other renewables to be pursued through PSCo’s IRP process.\(^{11}\)

Through demonstration projects and its green pricing program, PSCo has sought to demonstrate the viability of renewable energy technology projects in Colorado. PSCo has installed several small renewable projects to learn more about the technologies, their installation, and their associated costs. From 1991-1997, PSCo installed 43 kW of grid-connected solar and 13 kW of off-grid solar—mostly photovoltaic cells (PV), but some thermal systems—for a total of 56 kW. At that time, approximately 13 kW was funded through voluntary customer contributions made into the Renewable Energy Trust. As of 1997, Colorado’s Trust Fund was the most successful voluntary renewable energy program in the U.S., based on both the 14,000 participants and the $150,000 in annual revenues. In 1998, plans included funding an additional 10-16 kW of PV at Colorado schools.

PSCo also offers a rooftop photovoltaic (PV) installation program, Solarsource. Customers purchase the 2-3 kW systems and receive a $1/watt federal subsidy, as well as a $1/watt PSCo subsidy for installing the systems on their rooftops. Self-generation customers can also take advantage of net metering, where any electricity generated by

\(^{11}\) PSCo will also conduct solicitations for up to 676 MW of firm supply and for the new DSM referred to in section 2.1 above.
them causes the meter to run backwards, thus decreasing the total use recorded by the meter.\textsuperscript{12} PSCo has offered to provide net metering for up to 200 rooftop systems (each less than 10 kW, totaling 1 MW). Originally, PSCo planned to install fifteen of these small PV systems under the Utility Photovoltaic Group’s nationwide program; by September, 1997, one system was sold and installed and 3-5 others were being negotiated. As new technologies develop, PSCo is also investigating opportunities available for stand-alone, off-grid systems for agricultural and remote service, as well as building-integrated PV systems.

Though the large potential for wind energy in Colorado is known, the absence of a detailed characterization of the availability and distribution of wind resources within Colorado has been a barrier to widespread implementation. To help provide the needed detail with regard to wind, PSCo undertook to manage a seven-participant program to monitor ten promising wind sites in eastern Colorado (PSCo 1997a).\textsuperscript{13}

Although electricity generated from renewable resources costs more than most fossil fuel generation, some consumers feel the additional cost is worth the environmental benefit of decreased emissions from conventional resources. PSCo’s Windsource green pricing program offers consumers the opportunity to pay a premium to support generation from wind turbines. Customers who participate in Windsource pay a $2.50 premium over the base rate for each 100 kWh block of wind-generated electricity they want to support, up to 100% of their load. Approximately 5 – 6 blocks would cover the average household’s monthly electricity use. The premium is intended to cover additional costs above the baseline customer rates so as to provide incremental funding needed to construct and operate 700 kw wind turbines. Residential customers are required to commit to the program for one year, and commercial and industrial customers for three years. As of December 1998, the first 4.9 MW were commissioned and installed, with a further 15.2 MW expected to be installed and commissioned during 1999, bringing the total capacity resulting from the Windsource program up to 20 MW (PSCo 1998b).

**West Plains Energy**

WPE is in the early stages of developing a renewables program. In its Colorado service area, the utility is only considering wind-generated electricity at this writing, and may consider solar energy later. Customers will pay a price premium to participate. Electricity from wind will be sold in 100 kWh / month blocks.\textsuperscript{14}

**Other Utilities**

In addition to PSCo and WPE, a number of other utilities are developing modest renewable resource and/or green pricing programs. Initiatives include:

\textsuperscript{12} The meter will run backwards if the PV system is generating more than the household is using at that instant. If the customer uses more than the system generates, then the meter reads only that which is in excess of generation.

\textsuperscript{13} Total funding for this effort was $515,000 ($310,000 from PSCo) and the monitoring was to be completed late in 1998.

\textsuperscript{14} Frank Debacker and Mike Deggendork, WPE, personal communication, January 1999.
• Holy Cross Electric Association: This cooperative has 615 customers enrolled in its green pricing program, paying a premium to obtain wind-generated electricity supplied through a 1.75 contract with PSCo. To enlist more subscribers, the coop began negotiating for an additional 1.75 MW of wind power from an upcoming PSCo project. The coop is also experimenting with a small net metering project for solar PV.  

15

• City of Fort Collins: This municipal utility has 700 customers enrolled in its green pricing program, paying a $.02/kWh premium to obtain wind-generated electricity. This allowed the city’s supplier, the Platte River Power Authority, to build two 600-kW wind turbines (Fort Collins 1998).

• City of Colorado Springs: This municipal utility signed a 1 MW contract to purchase wholesale wind-generated electricity from PSCo. Under its green pricing program customers pay a $.03/kWh premium for this power. In addition to residential customers, five commercial customers are participating and the first 1 MW contract is sold out.  

16

Other municipalities and cooperatives offer green pricing programs to their customers. This includes various rural electric cooperatives through the TriState Generation and Transmission Company. In addition, the Western Area Power Administration is a federal entity that sells power generated from existing hydroelectric sources to utilities in the west.  

17

The above survey suggests that green pricing to promote windpower is the most common type of programmatic initiative through which Colorado’s electricity producers and distributors promote new renewable resources at present, followed by a number PV demonstration programs. The total impact of these initiatives on renewable capacity appears to be modest, summing to less than 5 MW at this writing, and perhaps 25 MW more if all succeed as planned.

In its report, the Renewable Energy Task Force recommended that an SBC to support renewable energy development be established in Colorado. The RETF did not recommend any specific level. The RETF did, however, estimate that a fee of 0.5 mills/kWh collected over the four-year period 1998-2001 might yield 240 MW of new renewable resources (RETFL 1997, page 119).

The survey of state actions in the next section of the report includes SBCs for renewables. It also includes another policy approach —requiring that electricity suppliers include minimum amounts of renewable energy resources in their supply resource portfolios.

15 David Church, Holy Cross Electric Association, personal communication, January 1999.
16 Peggy Ives, Colorado Springs Electricity Division, personal communication, January 1999.
17 Mark Roper, Governor’s Office of Energy Conservation, personal communication, January 1999.
3. Survey of New State Funding Structures

Restructuring has led several states to consider funding sustainable energy resources through a fee collected from ratepayers based on distribution service. This section of the report provides an overview of the major policy activities to date, followed by state-by-state detail. It also addresses resource portfolio standards, which may be considered a complementary and indirect method of funding publicly beneficial energy resources.

3.1 SBCs With Restructuring—And Without

As noted above, most jurisdictions have considered system benefits charges (SBCs) in the context of policy options related to the introduction of retail competition. However, the linkage between the SBC and retail competition is more a historical than a necessary one. In fact, an SBC approach could usefully be employed whether or not the electricity (or gas) industry is restructured. Consider the fact that funding for efficiency and renewable resources has been quite variable in jurisdictions without retail competition, or before its introduction. An SBC system can reduce fluctuations in support for efficiency and renewables in an environment with full regulation of retail electricity services. An SBC approach can also be combined with integrated resource planning in a fully regulated context. It can provide minimum levels of support for the targeted resources. The stipulated support levels would constitute baseline levels that could then be exceeded as required to attain an optimal resource plan.

The cases of Minnesota and Montana can be instructively compared here. Minnesota has not restructured and maintains an IRP regulatory framework. For several years there has been a statutory requirement that utilities invest portions of their revenues in energy efficiency—0.5 percent annually for municipal utilities and investor-owned gas utilities, and 1.5 percent annually for electric cooperatives and investor-owned electric utilities. This framework has facilitated substantial investments in energy efficiency since 1992—and while the levels have changed (growing to 1995, declining thereafter), the changes have not been erratic or dramatic. Through both laws and commission orders, Minnesota is also building a substantial renewable resource portfolio of several hundred MW of windpower.

Montana, on the other hand, passed a retail choice law in 1997. It also legislated a Universal Systems Benefit Charge (USBC), effective beginning in 1999, based on 2.4 percent of each regulated utility’s 1995 retail revenues. Percentage-of-revenues is the same funding basis as used for efficiency in “unrestructured” Minnesota. Montana’s USBC provides support for efficiency (including a minimum for low-income programs) and renewable resources.

Some twenty jurisdictions have given active consideration to SBCs as a way of supporting sustainable resource programs, so that their benefits are not lost in the transition to a restructured industry. In several cases, special provisions have been developed or proposed to support energy-efficiency programs targeted to low-income households. In addition, public benefit research and development activity has been included in some SBC systems.
Recently enacted SBC policies are generally designed either as charges (e.g., 3 mills per kWh) or as absolute dollar amounts that will then be collected through such a charge. The levels of such charges, or their calculated equivalents, vary widely in the 13 states that have so far fixed the initial amounts. The initial SBCs for efficiency range from hundredths of a mill per kWh in Illinois to about 3.4 mills/kWh in New Jersey. Thus far, SBCs provide support for renewables in 10 states, at levels ranging from an unspecified fraction of total SBC funds, up to 1 mill/kWh in Massachusetts (average over the first 5 years). Other states are actively considering SBCs for efficiency or may do so in the future.

SBCs are collected from distribution level customers on a per kWh sold basis. All customer classes (residential, commercial and industrial) generally pay the same rate. Typically the charges are to be collected as a separate rider or surcharge, although in Montana and Maine the efficiency monies will be bundled into distribution utility rates.

3.2 Establishing Program Funding and Administration

In principle the level of expenditures established to support efficiency would be informed by assessment of how well the private markets for energy-efficient products and services are functioning, what are the current and projected trends in energy resource costs, and the potential for public benefits beyond what the market is likely to do (Eto 1998, p. 21). In practice, the SBC levels set so far have not benefited from research specifically designed to answer these questions. Some states do include future proceedings and/or studies to establish appropriate ongoing levels.

Recent levels of DSM spending are the most common basis for establishing initial SBC levels. In New Jersey, for example, the initial SBC is explicitly the level of DSM spending in rates at the point of restructuring. In New York, on the other hand, an explicit decision to reduce spending on DSM was made when the SBC was established. Neither of these approaches is likely to offer much guidance for Colorado, where the fact that DSM spending is at lower levels than earlier in the decade, combined with the rapid growth in electricity demand, probably suggests an SBC that raises more money than at present.

The fundamental oversight role of utility regulatory commissions has been retained by most SBC programs. But within the framework of commission oversight, different administrative structures have been chosen by states implementing SBC programs. Some explicitly rely on the distribution utilities to continue to deliver efficiency under regulatory oversight. Others rely on a non-profit quasi-public corporation to administer SBC funds. Administration by an existing state agency is a third option. These structures are detailed in the state-by-state descriptions in the Appendix, while their pros and cons are addressed in section 4.1.

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18 Montana caps the dollar contribution due from very large volume customers.
3.3 An Indirect Funding Approach: Portfolio Standards

A companion policy to the SBC, a renewable portfolio standard (RPS) requiring competitive energy suppliers to provide a minimum portion of the energy they sell from renewable resources, has been adopted in 7 states, in combination with or independently of an SBC program. The RPS is under consideration in other states and at the national level. In addition to its SBC funding for sustainable energy resources and its RPS, New Jersey’s new restructuring law of February 1999 allows for an environmental portfolio standard to be considered by the regulatory commission. An efficiency portfolio standard has also been proposed to the NJ Board of Public Utilities.

A portfolio standard may be considered an indirect funding approach if the level of resources required by the standard is above that which is expected to acquired by the unassisted market. Suppliers subject to the standard would pay only to the extent they could not market additional efficiency resources on a user-pay basis.

3.4 State by State Survey

In order to provide information for Colorado policy stakeholders, we prepared descriptions of actions on efficiency and renewables undertaken in 19 states. These 19 comprise (a) the 17 states that are most advanced in restructuring, less to state which have included no provisions for sustainable technologies in their restructuring framework (Maryland19 and Virginia), and (b) four other states whose policies in support of efficiency or renewables provide interesting options.

Table 3.1 summarizes SBCs for efficiency and low-income efficiency, and includes all jurisdictions with SBCs for efficiency. Table 3.2 summarizes SBCs or portfolio standards supporting renewables energy resources, and includes all jurisdictions with one or both of those provisions. The appendix to this report contains state-by-state narratives that provide supporting detail on the information summarized in tables 3.1 and 3.2.

19 The Maryland statute provides for a study on this topic to begin in 2000 to inform possible future policy making.
4. Public Benefit Funding: Survey of Issues

This section sets out key issues confronting policymakers considering ratepayer funding of sustainable energy resources. As the Colorado Electricity Advisory Panel intends to examine issues associated with use of a distribution level fee to support public benefit energy programs, we focus on those issues. However, we also point out other funding approaches that have similar objectives. We first address energy efficiency generally, then low-income efficiency issues, and, finally, renewable energy.

4.1 Energy Efficiency

Policy Objectives

There are several energy policy objectives that policy makers may find are linked to whether or not, and how, to provide ratepayer funding for energy efficiency. The broad objectives that have figured prominently in other states’ consideration of systematic support for efficiency initiatives are highlighted in Box 1: energy cost savings; environmental protection; market transformation; and economic development.

Energy efficiency improvement which pay for themselves over their operating lifetimes are cost-effective to consumers. As energy efficiency programs promote increasing adoption of efficiency measures, consumers’ energy bill savings mount. Energy efficiency programs typically use a small amount of promotional or incentive dollars to leverage a larger volume of additional private investment in energy efficiency. By leveraging incremental adoptions of efficiency measures whose energy cost savings exceed their costs of installation and operation, efficiency programs produce reductions in the energy bills paid by energy users. Helping to pump-prime the market for cost-effective efficiency investments, to produce bill savings for households and businesses, has usually been one of the policy objectives influencing adoption of SBC structures to promote energy efficiency.

Protection of the environment refers to reducing the short and long run harms associated with energy supply and use. Increasing the pace and amount of market penetration of energy-efficient technologies and practices produces clear environmental benefits. Because it substitutes directly for energy consumption, efficiency adds to whatever environmental improvements are expected as a result of other voluntary environmental improvement initiatives and of federal and state environmental regulation. Reducing the expected level of use of conventional power generation reduces power plant emissions, but there are land and water use benefits as well. While the question of how to value the environmental benefits of efficiency in developing efficiency policy can be a complex one, the political processes that led to the

![Strategic Objectives for Efficiency](image)

- Energy cost savings
- Environmental protection
- Market transformation
- Economic development
SBCs for efficiency described in section 3 have all given weight to environmental benefits.

Market transformation refers to developing energy-related markets so that societally cost-effective efficiency measure will continue to be chosen by energy users. When DSM contributes to the transformation of markets for energy efficiency products and services, then the market sustains a greater level of investment in energy efficiency even after particular DSM programs, with their associated marketing and incentives, come to a close or are succeeded by newer initiatives. The perception that there remain substantial opportunities for development of the energy efficiency services and products market, and for accelerating the penetration of cost-effective technologies that reduce electricity consumption and demand, has been a key factor in the policymaking processes leading to the establishment of the SBCs for efficiency described in section 3.

Economic development is another theme that figures prominently in policy discussions of programmatic support for energy efficiency. The operating cost savings produced by efficiency measures provide disposable income that can be put to uses other than purchasing energy. Studies of energy efficiency, such as the *Colorado’s Energy Future* report of 1996, generally project positive economic development impacts—increases in net state income and employment—from the more rapid adoption of energy efficiency measures (see Laitner 1996, especially section V). At a more practical level, there has been interest in supporting further development of the infrastructure of energy service and product providers and energy service companies (ESCOs) that began to develop as a result of DSM in the 1990s—an issue that is relevant today in Colorado (see Nichols 1998).

The four strategic objectives identified here have elements of overlap and interpenetration. In addition, there may be other objectives that are relevant to developing public benefit efficiency initiatives. Box 1 simply lists four objectives that states have most often found to be positive drivers of energy efficiency policies and programs.

**Approaches to Ratepayer Supported Efficiency Programs**

The full range of federal and state policies that have, do, or could promote energy efficiency is beyond the scope of this report, which focuses on state-level approaches that use direct or indirect ratepayer funding as vehicle to support efficiency gains beyond those captured by existing programs or by market trends. Even within this defined focus, however, there are several approaches to developing a structure of programmatic support for efficiency to take note of before focussing in on the approach of interest to the EAP.

One traditional method in DSM has, of course, been to approach the issues on a case-by-case basis. The venues have varied from jurisdiction to jurisdiction: rate cases, resource

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20 In the IRP context, DSM aims mainly at avoiding the building of capacity or production of energy; long-lasting market transformation effects are desired but less emphasized. In a market transformation program, the emphasis is more on market effects after the program ends, i.e., its lasting effects.
planning cases, siting cases, and other proceedings have been used by regulators to assess and decide on needs and opportunities on a utility-by-utility basis.

Turning from case-by-case to more systematic approaches, we still confront a number of alternatives. As the narratives in section 3 show, states that have made provision for a fee collected at the distribution level have used one of the following approaches:

- A specified charge for each kWh sold.
- A specified amount of dollars to be collected through a charge per kWh sold.
- A percentage of utility revenues to be collected through a charge per kWh sold.
- A process for determining the amounts of dollars to be collected through a charge per kWh sold.

We suspect that Colorado policymakers will be attracted to one of these four straightforward approaches used in other states. Nevertheless, it is useful to bear in mind that a public benefits funding approach could be structured in other ways than these four. For example, a fee could be based upon commodity electricity supplied, and collected by the regulated or unregulated entity providing retail generation service.

Further, even if fees are applied statewide to all distribution companies (or all generation service providers), they could be structured so as to incorporate other purposes besides raising the funds desired to support efficiency programs. For example, Biewald et al. pointed out that a fee could be based on the primary fuels used to meet electric demand (Biewald 1995). The total primary energy associated with a year of electricity generation in the state would then be established (fuel value in MMBtu). A statewide funding target would be established and the share of the total for each electric distribution company would be based on the ratio of primary energy associated with power production to supply the distribution company’s customers to the sum of primary energy associated with electricity generation for the entire state. This fee would provide an incentive for individual distribution companies to use efficient boilers with lower Btu input per kWh output.21

Finally, an indirect approach that has been suggested for a restructured environment is the Energy Efficiency Portfolio Standard (EEPS). An EEPS would require that all electricity suppliers deliver a specified amount of energy efficiency proportional to their energy sales (Nichols 1997). Under an EEPS, suppliers have the incentive to sell energy-efficiency services on a profitable business basis. To the extent it proves difficult to sell energy efficiency outright, suppliers would need to subsidize efficiency to meet their required delivery level, and in this way an EEPS could provide funding for efficiency. An EEPS system could employ tradable energy efficiency credits, similar to the renewable

21 Biewald also outlined a fee based on the amount of pollution associated with the electricity generated. This fee would be paid by vertically integrated utilities or by retail electricity suppliers. Again a statewide efficiency funding target is established. In order to use this structure, the pollutants to be included must be determined and weighted to create an index allocating the fund to each pollutant. Because environmental costs would be internalized to some degree, the annual level of pollution would decrease.
energy credits expected to be traded under a Renewable Portfolio Standard. Indeed, one intriguing possibility is for an environmentally beneficial portfolio standard that can be met from renewable resources or energy efficiency.

Establishing the Scope and Amount of Funding

If Colorado decides that SBC funding is appropriate in a restructured environment—or that such a fee is appropriate in the present industry structure—several design issues must be addressed. The amount of funding—its level and duration—is of course a key issue. There is a clear need for market research and resource analysis to inform deliberations regarding the desired amount of funding (Eto 1998). The 1996 study *Colorado’s Energy Future* (Laitner 1996) was comprised of a range of cost-effective efficiency measures and is of substantial indicative value. That research, however, needs to be extended and updated. Little such research has been conducted by the state’s largest utility, PSCo. Needed is a timely assessment of how well markets for energy-efficient products and services are functioning, current and projected trends in energy resource costs, and the potential for public benefits beyond what the market is likely to do.

The current level of spending on efficiency programs in Colorado is low by any measure. Under the 1998 Settlement in its 1996 IRP case, the state’s largest utility, PSCo, is committed to spending $10 million on DSM over the four-year period 1999-2002. This works out to about a hundredth of a mill per kWh of sales over the period, a level of investment that is lower than that of any state which has adopted an SBC for efficiency. By contrast the efficiency scenario developed in *Colorado’s Energy Future* projected that, for a ratepayer investment that would result in a maximum rate increase of 1.7 mills/kWh (1996$) in the year 2010 (less than 3%), the average electricity bill would be decreased by over 12 percent relative to its expected level in that year (Laitner 1996, p. 102). In addition to the direct electricity resource savings that this efficiency scenario, its implementation was projected to result in increases in net state employment and decreases in environmental impacts.

One basis that several states have used as a point of departure in establishing SBCs for efficiency is the current or recent level of DSM spending. Some have chosen to maintain that level, others to reduce it. Because of Colorado’s very low level of current spending, neither of these approaches would lead to a significant level of support for efficiency programs. The fact that Colorado’s DSM spending is a low levels, combined with the rapid growth in electricity demand, suggest that policymakers consider an SBC that raises much more money than is being applied to efficiency at present.

A countervailing consideration is the near-term impact of an SBC upon ratepayers. In a rapid growth region like Colorado, it is likely that in the long run energy-efficiency measures can reduce the level of rates, especially for vertically integrated utilities. But the SBC is an immediate charge to ratepayers, and its affordability must be assessed by

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22 The 1.7 mill figure is a rate impact calculated assuming conventional bundled ratemaking and is not strictly equivalent to an SBC charge. It does, however, give some idea of the cost per ratepayer for the efficiency benefits estimated by Laitner.
policymakers. The weight given to countervailing considerations in establishing an SBC is essentially the product of debate amongst parties influencing policy making in a given state.

The duration of fund collection is a key component to the success of these types of programs and there are several ways it can be structured. The funds can accumulate until a “sunset” date in the legislation. But since it is difficult to predict how long such a program would be needed to achieve the strategic objectives, many policymakers prefer to review the rule at a later point in time, when past performance can be examined to determine if the rule should remain in place or not. Finally, some have established a program that would continue until an additional law is created to dismantle the provision. Eto et al. recommend that ratepayer-funded programs be established at least for a five-year period, at which time a review can be conducted to inform decisions about continuing the program (Eto 1998, p. 24). In doing so, enough time is given so that progress towards meeting objectives can be measured, the adequacy of the funding level determined, and the market evaluated to see if market penetration of program measures has become self-sustaining.

Most SBC programs apply to regulated, investor-owned utilities. However, if legislation is used to establish the SBC, policymakers can consider bringing publicly owned utilities into the SBC system.

**Issues of Oversight and Governance**

In the typical IRP context, in Colorado and elsewhere, it is the regulatory commission that establishes the objectives of DSM and oversees the funding and implementation of DSM programs. The administrative responsibility for DSM lies with the regulated utilities, but different approaches to the utilities’ role in implementation have been taken. In some jurisdictions, utilities have been expected to distance themselves from implementation; their role is limited to soliciting offers of demand-side resources based on their planning and avoided cost parameters. In others, the utilities are very involved in program design and implementation, even though the actual field delivery of DSM services is typically contracted out. In still others, intermediate or mixed approaches have been used.

When an SBC structure is established, the pattern of oversight and governance may remain very like that typical of IRP frameworks. The regulated utilities submit efficiency plans for review and approval by the regulatory commission, then administer the programs contained in their approved plans. The continuation of such a structure can be seen in several of the SBC structures summarized in section 3 of this report.

The fundamental oversight role of regulatory commissions has been retained by most SBC programs established to date. Within the framework of that commission oversight, new criteria for assessing efficiency programs and new approaches to implementing them may need to be considered. But commission responsibility for governance and oversight It is a logical role for programs based on ratepayer funding. In some cases, restructuring legislation has brought another agency into the governance process. For example, in Massachusetts the Division of Energy Resources will review and approve utility
efficiency plans, although the regulatory commission retains authority to oversee program cost-effectiveness and program spending. In New Jersey, the Department of Environmental Protection is co-involved with the regulatory commission in review of utility efficiency plans and in decisions on funding level changes. Despite such partnership arrangements, the fundamental oversight position of the utility regulatory commissions is retained.

There have been larger differences among states in approaching the utility role in administration of efficiency programs. The chief advantages of utility administration and implementation have to do with the utility’s access to customers, its business interest in understanding end-use markets, and, in many cases, the background of expertise built up in DSM. The most frequently noted disadvantages of utility administration are a tension between an efficiency agenda and the utility’s business objective of increasing sales, and the fear of anti-competitive utility practices among non-utility energy service provider businesses. These “pros” and “cons” need to be assessed by policy-makers as part of the establishment of any SBC program.

The chief alternative to utility administration is administration by a state or quasi-state agency. In New York, administration of efficiency programs is being transitioned from the utilities to the NYSERDA, as detailed in section 3. California’s restructuring legislation and the regulatory commission’s initial restructuring orders evidenced the intent of removing efficiency programs from utility administration to administration by a California Energy Efficiency Board established by the PUC, but this transition was subsequently deferred until after 2001. Some states, e.g. Montana and Minnesota, provide for a mixed system, with state agencies taking up slack left by utilities.

In considering utility vs. agency administration, policymakers must take into account the challenges associated with establishing a new entity or giving a major new role to an existing entity. NYSERDA is a long established public benefit corporation that has operated a wide-ranging research and demonstration programs. Thus, its assumption of additional efficiency responsibilities was an incremental change. In California, however, the transition to administration by the new CBEE proved contentious, and was deferred.

If the utility retains a key administrative role, one way to align its business interests with its efficiency responsibilities is through appropriate incentives. Whether a utility is vertically integrated or is a distribution-only company, DSM reduces utility sales, adds to utility O&M expenses, and tends to add to utility revenue requirements per unit of electricity sold. In the past, the Colorado Commission recognized the need to provide business incentives for utility pursuit of DSM by providing for DSM cost recovery and establishing shareholder incentives. A demand-side management cost adjustment clause (DSMCA) that includes recovery of utility costs and shareholder incentives was adopted in 1990 (PUC 1990b), and remains in effect today. Shareholder incentives based on DSM performance were in effect in 11 other jurisdictions in the U.S. and one in Canada in 1998 (Dunsky 1998, Annex B).  

23 Some of these jurisdictions were restructuring their electricity industries and others were not.
It is also important to consider the connection between ratemaking and utility support of efficiency initiatives. For example, if a multi-year performance-based framework is adopted, the basis on which target revenues are established has implications for efficiency. If a price cap approach is used, it provides a strong incentive for the utility to increase sales in order to reduce rates and “beat the cap.” If, on the other hand, a revenue-per-customer approach is used to establish the target revenues, the utility has no incentive to increase energy usage per customer (Biewald 1997). While these considerations are critical if the utility is charged with efficiency program administration, they also have relevance if it is not. Even with non-utility administration of SBC funds, there is still reason to pay attention to the demand-side incentives that ratemaking is creating for electricity distributors.

Criteria for Application of Funds
Establishment of an SBC program is an opportunity to revisit the criteria that have been used to review, establish, and eventually evaluate energy-efficiency initiatives. The major objectives cited in establishing the SBC will imply the criteria that should be used for program development, for example cost-effectiveness. The purpose of establishing an SBC program is to secure the public benefits of efficiency initiatives. To assess public benefits in economic terms means to measure them from a societal perspective, comparing all of the benefits to society (proximately, the ratepayers of Colorado) with all of the program’s costs to society. From a societal perspective, benefits include the value of the primary resource saved —in this case electricity, itself comprised of several different avoided cost components— but also other benefits that are capable of ready quantification, such as water savings, other energy savings, maintenance savings, and environmental impact savings. Costs, similarly, include not just the ratepayer funds invested in the program, but all other cost components that are readily quantifiable, such as costs expended by on efficiency measures by customers themselves, or contributed by third party funders such as governments.

In addition to the fundamental issue of how to apply cost-effectiveness criteria to public benefit programs, other criteria may include market development objectives and equity considerations. Market development objectives may imply targeting funds in one way —for example to have the maximum market transformative impacts— while equity may imply different priorities —providing opportunities to participate in efficiency programs to all customers, for example. Guidance on how to assess cost-effectiveness, and other criteria governing an SBC program, may be included in the decisions establishing the SBC. Alternatively, such issues may be deferred to a proceeding that would occur following the decision to establish an SBC.

4.2 Low-Income Services

Some states have made special provision for support of energy efficiency in the low-income sector, often defined as households whose incomes are at 150% or less of the federal government’s poverty guidelines. Pursuit of low-income energy efficiency meets many needs and has several benefits. First and foremost it helps families of limited means to pay their energy bills. This in turn reduces the costs which utilities and energy
suppliers incur in managing customer arrearages and potential service shut-offs. In addition, there are comfort and even health and safety benefits that arise from well-designed programs, for example those combining comprehensive house treatments with effective customer education. Policymakers in Colorado will need to consider whether to provide explicit funding levels in this area, or leave the matter to subsequent determination during the oversight and implementation process (see Colton 1999).

4.3 Renewable Energy Resources

Strategic Objectives
The primary energy policy objective that policy makers in Colorado and elsewhere have found linked to consideration of programs to support renewable resources is environmental protection. The environmental improvement objective and its relation to renewable energy was summarized by the RETF as follows:

“The sun and wind, in particular, provide clean energy that can be harnessed with little or no impact on the environment. Colorado now relies on fossil fuels for almost all power generation, so greater use of renewable energy could help reduce the impact of drilling and mining, preserve precious water, and cut particulate pollution, acid rain, and greenhouse gases.” (RETF 1997, page 5.)

This fundamental objective leads to a derivative one: market development. Wind, solar, and other renewable energy resources are still more costly than fossil-fired generation sources. In order to support renewables today, their environmental benefits must be given some non-economic weight. But the market price of most renewable energy resources has been falling steadily. Programmatic support of renewable energy resources may accelerate the decline in the market price of renewables. The objective of making renewable energy resources as competitive as possible in the energy supply market is a common one in renewable energy policy development.

Risk mitigation is another objective cited in renewable energy policy discussions. The RETF pointed out that new renewable resources can help mitigate energy supply risks by diversifying the energy supply portfolio. Economic development objectives are cited as well —wind energy plants generate more employment than fossil fired plants, for example (RETF 1977, page 6). However real these additional benefits may be, it would appear that the main objectives linked to renewables policy are environmental protection and promotion of the commercial viability of environmentally benign technologies.

Approaches to Supporting Renewable Energy Resource Development
As was the case with our discussion of energy efficiency, the full range of federal and state policies to promote renewable resources is beyond the scope of this report. Here we focus on state-level approaches that use ratepayer funding or resource portfolio standards
as vehicles to support efficiency gains beyond those captured by existing programs (e.g., green pricing\textsuperscript{24}) or by market trends.

**SBCs to Support Renewable Energy**

As the narratives in section 3 show, the following approaches have been used by states that have made provision for a fee collected at the distribution level:

- A specified charge for each kWh sold.
- A specified amount of dollars to be collected through a charge per kWh sold.
- A process for determining the dollars to be collected through a charge per kWh sold.
- A per customer charge (Illinois only).

The amount of funding provided for in these jurisdictions has varied considerably, though no SBC program has adopted a fee to support renewables that exceeds 1 mill/kWh. The Governor’s Renewable Energy Task Force estimated that an 0.5 mill fee would raise a total pool of $76 million. If allocated to near competitive technologies, emerging technologies, customer rebates, and education (in that order), the RETF estimated that 240 MW of new renewables could be acquired in Colorado.

In deciding on whether to develop an SBC for renewables, and at what level to set it, Colorado policy makers will need to assess the costs and benefits likely from such a fee. The role of an SBC will depend, in part, upon whether or not a renewable resource portfolio standard is developed.

Neither the SBC nor the RPS impacts competition among electricity suppliers in a restructured environment. The SBC is levied as a non-bypassable charge at the distribution level, and thus does not affect the pricing of retail supply. The RPS, as described further below, imposes a requirement that all retail energy suppliers include stipulated portions of renewable energy resources in their supply mix. Since the RPS applies equally to all suppliers and permits trading of renewable resources amongst them, it imposes no competitive advantage or disadvantage on any one supplier — the increase in their cost due to an RPS is the same for all suppliers. Thus, the SBC and the RPS are both fully compatible with retail competition.

The RETF recommended an SBC for renewables instead of a resource portfolio standard. However, SBC and RPS are not necessarily alternative policies. An RPS is a market-based mechanism, and encourages suppliers to provide the resources required at the least cost, trading amongst themselves until a market-clearing price for the needed resources is reached (Rader 1996). Interstate trading would necessarily be required. An SBC creates a pool of funds, can be a resource in promoting commercialization of technologies that are currently more costly, and unlike the RPS can be applied exclusively to in-state resources. Thus the SBC and the RPS can complement one another. Indeed, both have been chosen together in Arizona, Connecticut, Maine, Massachusetts, and New Jersey.

**Oversight and Governance**

\textsuperscript{24} Green pricing is discussed in sections 1.3 and 2.5 above.
The authority to oversee the application of SBC funds may be given to the utility regulatory commission, or to another public agency or corporation. In contrast to SBC programs for efficiency, authority over renewable energy SBC funds has usually been given to entities other than the regulatory commission (Table 3.2). The entity charged with administering the renewable fund then develops criteria and processes for applying the monies. A solicitation process is used to select projects or programs for support. Usually utilities may participate in the bidding programs along with other parties.

Colorado policymakers will need to decide whether to lodge governance of any renewables fund with the PUC, the Governor’s Office of Energy Conservation, or some other entity. The RETF made no recommendation in this regard, though it did envision that competitive solicitations would be used to apply most of the monies (RETF 1997, p. 118).

Qualifying Renewable Resources
If an SBC is created, a definition of what is considered eligible for renewable technology funding must be established, especially since different stakeholders consider different technologies to be renewable. Similarly, an RPS program must specify the categories and amounts of renewable resources required.

Wind turbines, solar photovoltaic cells, solar thermal energy, and small hydroelectric facilities are generally accepted as renewable sources of energy. But sources such as biomass, fuel cells, municipal solid waste (MSW) incineration and large hydro must be discussed in detail.

Some believe that biomass should only be considered renewable if additional resources are planted to replace those used (i.e. it is planted and harvested as a crop), or if it is biogas from wastewater or landfills. Some might favor supporting fuel cells as a transition technology towards a hydrogen economy, while others might feel that it should not be included because—right now—fuel cells generally use natural gas. Although MSW incineration uses waste products as a fuel, there is a large concern with the heavy metals emitted in the air and collected in the ash. Finally, large hydroelectric projects destroy habitats and significantly alter the composition of the river below the dam. Policymakers must thus select definitions of supportable renewable energy technologies.

Renewable energy technologies have a wide range of installed costs, such that only a few of the technologies have low cost per installed capacity. If a goal of an SBC program is to promote a portfolio of technologies, then different technologies can be separated out so that a certain amount of funds are used at different technology cost levels. This will increase the number of technologies included in the portfolio and direct funds to technologies that need more assistance to break into the market. California has recognized that in order to encourage implementation of solar photovoltaics, which is more costly than other technologies, it needed to have solar PV in a separate funding category. In other jurisdictions, selection of technologies is left to the SBC fund administrator.
Applying SBC Funds
Renewable resource projects that provide significant amounts of capacity—wind farms, for example—are generally financed like other non-utility power plants. They use project financing. An analysis by Wiser and Pickle observed that:

“Financing is particularly important to renewables because renewable energy technologies often have high capital costs. In addition, renewables are currently disadvantaged in the financing process vis-à-vis other generation technologies because of perceived resource and technology risks, small project size, and small industry size.” (Wiser 1997, page xiv.)

Electric industry restructuring can be expected to exacerbate these financing barriers. Long-term power contracts that facilitate project financing will be scarcer, and project developers may require more equity and less debt. Few renewable energy developers are well capitalized at present. If the future prices of conventional resources are seen as likely to remain lower, the difficulties for renewables will be further exacerbated. These considerations suggest that a good use of SBC funds would be to provide funding directly to new renewable energy projects (Wiser 1997, page 45).

Beyond direct subsidization of new renewable energy projects, there are a number of other programmatic options for the application of SBC funds. These include:
- Rebates to customers who purchase renewable energy (encouraging green pricing programs).
- Contributions to marketers of green pricing programs.
- Consumer education and marketing programs.
- Financing Programs (low-interest loans, loan guarantees)
- Incentives for manufacturing renewable energy technologies.
- Further research on intra-state resource availability.
- Support for research and development.
- Technology demonstration projects.
- Developing methods for certifying and tracking green power.

In setting up an SBC program for renewables, policymakers may choose to specify the types of programs to be pursued. Alternatively, they may provide general goals and leave program design up to the administering entity and its advisory groups.

Compatibility with a Regulated Industry
The RPS can be a means of promoting new renewable resource projects with or without restructuring. As the Renewable Energy Task Force observed:

“In general, resource portfolio requirements can be applied under either current electricity regulation or retail competition. Under current regulation, an RPS could apply to all distribution utilities in the state or

25 Incentives to renewables can be structured based on project output (production incentives or a purchased power agreement at a price premium), or as grants toward project construction and operation.
region. Under retail competition, this obligation could extend to all retail suppliers.” (RETF 1997, page 120.)

The case for an SBC seems to be somewhat stronger under restructuring, due to the increased financing barriers that retail competition would create. Nevertheless, even if the state decides to not enact restructuring legislation, policymakers can consider implementing a public benefits fund, for example to support renewable energy research and demonstration projects.
5. Directions for Colorado

Energy Efficiency
Colorado’s demand for both electricity and other forms of energy is growing rapidly. There is clear evidence that there remain substantial opportunities for development of the energy efficiency services and products market and for accelerating the penetration of cost-effective technologies that reduce electricity consumption and demand (Laitner 1996; Nichols 1998). Indeed, with the growth in energy demand, the lost opportunities for saving energy may be growing.

A second generation of energy efficiency initiatives can tap these cost-effective opportunities to save energy and reduce the growth in demand. Renewed energy efficiency can reduce pressures on the electric infrastructure, improving reliability and deferring the need for construction of additional transmission capacity. It can reduce household and business energy bills and benefit the environment. Additionally, if such renewed programmatic attention to energy efficiency is sophisticated in design and sustained over a critical period of time, it can also help to further develop the energy efficiency product and services market, contributing to market transformation for the long run.

Policy initiatives are required for movement toward (a) scoping out efficiency opportunities and (b) designing second-generation DSM programs to pursue those opportunities. The history of energy efficiency in Colorado and elsewhere shows that well-designed market interventions are needed to maintain momentum toward overcoming the market barriers to energy efficiency, realizing its economic and environmental benefits, and transforming markets so that they can support higher levels of energy efficiency products and services on a sustainable basis.

If the electricity industry is restructured, Colorado policymakers should adopt an SBC program to ensure that the benefits of continued promotion of efficiency are not lost in a regime of retail competition. Since the present level of ratepayer investment in efficiency is so low under the present IRP structure, we also recommend that an SBC program be considered independently of whether or not Colorado restructures its electricity industry.

Renewable Energy Resources
Apart from existing generation from big hydro facilities, the amount of generation from renewable resources in Colorado is very small. However, Colorado has considerable potential for developing new renewable energy resources, particularly in the areas of wind energy and solar energy. A start has been made through the development of green pricing programs for windpower at PSCo and several smaller utilities. In addition there are some programs to support installation of photovoltaic cells both on and off grid.

The question for Colorado policymakers is whether to further accelerate the pace of development of these renewable resources through either financial commitment or
mandatory requirements. The actions taken by other jurisdictions and summarized in this report provide examples both of SBC approaches and of mandatory portfolio standards.

If Colorado policymakers desire to realize the environmental and market development benefits of supporting additional renewable energy resources, both the systems benefits charge approach and renewable energy portfolio standards should be seriously considered. These policy options, particularly the RPS, should also be considered independently of the question of whether or not to restructure Colorado’s electricity industry.


EAP RFP: Request for Proposals on Socio-Economic and Legal Issues, issued by the Colorado Division of Purchasing on behalf of the Public Utilities Commission for the Electricity Advisory Panel, September 1998.


APPENDIX

State Provisions to Support Sustainable Energy Resources

This table provides narratives of two types of state action to support energy efficiency or renewable energy resources. These actions are (1) funding through charges collected at the distribution utility level and (2) portfolio standards that apply to retailers selling electricity or gas delivered through distribution utility systems. The table provides narratives for all states that had implemented one of these types of policy by April 1999. It also includes narratives for selected proposed policies.

States included in this appendix are:

- Arizona
- California
- Connecticut
- Delaware
- Illinois
- Iowa
- Maine
- Massachusetts
- Minnesota
- Montana
- Nevada
- New Hampshire
- New Jersey
- New Mexico
- New York
- Pennsylvania
- Rhode Island
- Vermont
- Wisconsin

This Appendix includes corrections made on 27 May 1999.
ARIZONA

The Arizona Corporation Commission (ACC) issued Decision No. 59943 in December 1996 establishing retail competition. This Order instructs utilities to include a System Benefits Charge in their individual restructuring plans. It also establishes a Solar Portfolio Standard for Electric Service Providers. Decision No. 61272, issued on December 11, 1998, presents modifications to the earlier Order concerning the System Benefits Charge and the Solar Portfolio Standard. On January 5, 1999, the ACC stayed the electric competition rules. On February 5, 1999, the Hearing Division issued a proposed order containing modifications to the rules.

EFFICIENCY

**Funding Structure:** Non-bypassable rate or related mechanism.

**SBC Level:** To be determined in individual utility restructuring cases, per the current version of the rules, the charge must be sufficient to fund the affected utilities' Commission approved low income, DSM, renewables, market transformation, environmental, long-term public benefit research and development, and nuclear fuel disposal and nuclear power plant decommissioning programs in effect from time to time. No specific charges for low income energy efficiency are given. The proposed modifications of the rules added consumer education and moved market transformation to stranded costs.

**Collection Base:** All distribution utility customers who participate in the competitive market. The proposed modifications of the rules would recover the SBC from all consumers located in the utility's service area.

**Duration:** Duration of the SBC is open-ended. Affected utilities have to file for review of the level of their SBC every 3 years. The proposed rule modifications require reviews at least every 3 years.

**Oversight:** Arizona Corporation Commission must approve programs and cost recovery charges.

**Implementation:** Affected utilities will implement Commission approved programs.

RENEWABLES

**Renewables Portfolio Standard:** Starting in January 1999, 0.2% of electricity sold competitively must come from solar energy. In 2000, this increases to 0.4%. In 2001, 0.6% of all retail electricity must come from solar sources. In 2002, this increases to 0.8%. From 2003 through 2012, the standard is 1%. Solar built in 1997 or 1998 will receive double credit. Solar energy can be purchased or generated by the seller. Penalties of $0.30/kWh may be assessed for failure to meet the Solar Portfolio Standard. The proposed rule modifications eliminate the Solar Portfolio Standard.
Oversight: Arizona Corporation Commission.

Criteria: Qualifying resources are new photovoltaic or solar thermal sources (installed Jan. 1997 or later). No other renewable energy resources are included in the standard.

Implementation: Electric Service Providers.

CALIFORNIA

The California Legislature passed Bill Number AB 1890 into law on September 24, 1996, calling for the restructuring of California's electric industry. This law provided for the collection of revenues from distribution utility ratepayers to fund energy efficiency and renewables during the transition to retail competition in electricity supply.

EFFICIENCY

Funding Structure: Annual funds to be spent on energy efficiency are stipulated.

SBC Level-EE: The law specifies minimum annual funding levels for three CA electric companies to collect and spend on energy efficiency and conservation measures as follows:

- San Diego Gas and Electric Co., $32 million/year from 1/1/98 until 12/31/01.
- Southern California Edison Co., $90 million/year from 1/1/98 until 12/31/00; $50 million for 2001.
- Pacific Gas & Electric Co., $106 million/year from 1/1/98 until 12/31/01.

Funds to be collected total $872 million over the 4-year period.

Funding Level- LI: The Law stipulates that low income programs (energy efficiency and other services) are to be funded at not less than 1996 levels based on an assessment of customer need.

Collection Base: The SBC is to be collected from all electrical distribution utility customers.


Oversight: The Public Utilities Commission (CPUC) reviews and approves efficiency programs with input from the California Board of Energy Efficiency (CBEE) established under the CPUC.

Criteria: Energy efficiency and conservation activities must be cost effective.

Implementation: The CPUC designated the utilities as “interim” administrators of energy efficiency and low-income assistance programs through the year 2001. The objective is still to transition to non-utility administration after 2001.

RENEWABLES

Funding Structure: Annual funds to be spent on renewables are stipulated.

SBC Level: The law specifies minimum annual funding levels for three electric companies to collect and spend on renewables as follows:
San Diego Gas and Electric Co., $12 million/year from 1/1/98 until 12/31/01.
Southern California Edison Co., $49.5 million/year from 1/1/98 until 12/31/00;
$76.5 million for 2001
Pacific Gas & Electric Co., $48 million/year from 1/1/98 until 12/31/01
Funds to be collected total $540 million over the 4-year period.

The PUC can extend the collection period up until March 31, 2002, to ensure that funds allocated to renewables equal $540 million. Each electric company must also allow customers to make voluntary contributions through their utility bill payments to go to renewables.

**Collection Base:** The SBC is to be collected from all electrical distribution utility customers.

**Duration:** The collection of funds shall take place between January 1, 1998 through December 31, 2001. The CPUC's authority to collect funds shall become inoperative on March 31, 2002.

**Oversight:** Funds collected will go into a subaccount of the Energy Resources Programs Account to be administered by the California Energy Resources Conservation and Development Commission.

**Criteria:** Funds are to be used for in-state operation and development of (1) existing and (2) new and emerging renewable resource technologies. No less than 40% of the funds shall be allocated to either category. An emerging renewable technology is a new renewable technology, including, but not limited to, photovoltaic technology, that is determined by the California Energy Resources Conservation and Development Commission to be emerging from research and development and that has significant commercial potential.

**Implementation:** The California Energy Resources Conservation and Development Commission is to recommend implementation mechanisms to the California State Legislature.

**Renewables Portfolio Standard:** No RPS has been established.

**Sources:**
California AB1980.

CONNECTICUT

The Connecticut Legislature passed Public Act No. 98-28 on electric restructuring. It was signed into law in April 1998. The law provides for ratepayer funding for efficiency and renewables, as well as an RPS.

EFFICIENCY

**Funding Structure:** Law stipulates a mills/kWh charge to be collected for energy efficiency.

**SBC Level- EE:** 3.0 mills/kWh

**SBC Level- LI:** A systems benefits charge can be collected for low income conservation programs approved by the Department of Public Utility Control (DPUC), but no specific amount is required.

**Collection Base:** All electric distribution company end use customers.

**Duration:** The collection of the System Benefits Charge is to begin January 1, 2000 and is to last indefinitely.

**Oversight:** The DPUC will appoint and convene an Energy Conservation Management Board to advise and assist in developing programs to be funded. The DPUC must approve programs and spending plans.

**Criteria:** Programs are to be screened for cost-effectiveness and reviewed annually. If a program is not cost-effective, it shall either be modified to meet the test or it shall be terminated.

**Implementation:** Electric distribution companies will develop and implement a comprehensive DSM plan, with assistance from the Energy Conservation Management Board.

RENEWABLES

**Funding Structure:** The law stipulates a mills/kWh charge to be collected for renewables.

**SBC Level:** Starting January 1, 2000- 0.5 mills/kWh; July 1, 2002- 0.75 mills/kWh; July 1, 2004 and on- 1 mill/kWh. Funds collected through this charge are to go onto the Renewable Energy Investment Fund.

**Collection Base:** All electric distribution company end use customers.
**Duration:** The collection of the System Benefits Charge is to begin January 1, 2000 and is to last indefinitely.

**Oversight:** The Renewable Energy Investment Fund will be administered by Connecticut Innovations, Inc. The funds will be used for expenditures which promote investment in renewable energy sources which will serve end use customers in Connecticut.

**Criteria:** Renewable energy sources that can be funded with his charge include solar energy, wind, ocean thermal energy, wave or tidal energy, fuel cells, landfill gas and low emission advanced biomass conversion technologies and other energy resources and emerging technologies which have significant potential for commercialization and which do not involve the combustion of coal, petroleum or petroleum products, municipal solid waste or nuclear fission.

**Implementation:** Connecticut Innovations, Inc., may use funds for expenditures such as grants, direct or equity investments, contracts or other actions which support research, development, manufacture, commercialization, deployment, and installation of renewable energy technologies, and actions which expand the expertise of individuals, businesses, and lending institutions with regard to renewable energy technologies.

**Renewables Portfolio Standard:** The RPS stipulates that from July 1, 1998 through June 30, 2001, 0.5% of output is to be generated from Class I renewables and an additional 5.5% is to be generated from Class I or Class II renewables, as defined in the law. These percentages are to increase every year, starting on July 1, 2001 until 6% of output is generated with Class I renewables and an additional 7% is generated with Class I or Class II renewables on or after July 1, 2009.

**Oversight:** The DPUC will administer the RPS.

**Criteria:** Class I renewables include solar, wind, landfill gas, fuel cells, and sustainable biomass, provided that the biomass facility began operation no earlier than July 1, 1998. Class II renewables include hydro, other biomass and trash to energy. These requirements are total renewable requirements.

**Implementation:** Competitive electric suppliers must meet the RPS.

**Sources:**
DELAWARE

The Electric Utility Restructuring Act of 1999 was signed into law in March 1999. This Act calls for a charge to be collected from ratepayers to fund energy efficiency and low income programs.

EFFICIENCY

Funding Structure: The law establishes two per kWh charges: one to be used for energy efficiency and one to be used for low income programs.

SBC Level- EE: The Public Service Commission (PSC) is to reassign to the separate Transmission and Distribution rates of each rate class from the total base rates 0.095 mills/kWh to be deposited each month by Delmarva Power & Light (DP&L) into an environmental incentive fund effective on October 1, 1999.

SBC Level- LI: The PSC is to reassign to the separate Transmission and Distribution rates of each rate class from the total base rates 0.095 mills/kWh to be deposited each month by Delmarva Power & Light into a low income program effective on October 1, 1999.

Collection Base: The charges are to be collected from all rate classes of DP&L.

Duration: The charges are to be collected beginning October 1, 1999 and are to last indefinitely.

Oversight: The Public Service Commission is to oversee both funds.

Criteria: The environmental incentive fund is to be used to fund environmental incentive programs for conservation and energy efficiency within DP&L's service territory. The low income fund is to be used to fund low income fuel assistance and weatherization programs within DP&L’s service territory.

Implementation: The environmental incentive fund is to be established and administered by the Delaware Economic Development Office, in consultation with the Division of the Public Advocate. The low income fund is to be administered by the Department of Health and Social Services, Division of State Service Centers.

Sources:
ILLINOIS

House Bill 362 called for the start of competitive provision of utility services and was signed into law in December, 1997. This act provides funding structures for renewables and energy efficiency.

EFFICIENCY

**Funding Structure:** The law establishes a total state-wide dollar amount to be spent on residential energy efficiency.

**SBC Level- EE:** Beginning in 1998, a total statewide annual contribution of $3 million will be given to the Department of Commerce and Community Affairs (DCCA) from electric utilities to set up the Energy Efficiency Trust Fund. Each electric utility's share of this $3 million will be proportional to the number of kWh they sold in the 12 months preceding the year of contribution.

**SBC Level- LI:** EETF monies may be used to support efficiency in low income housing, but no support level is specified.\(^{26}\)

**Collection Base:** How utilities will recovery contributions to the EETF through rates is not specified in the legislation.

**Duration:** Funding for efficiency began January 1, 1998 and is to last 10 years.

**Oversight:** Funds collected from the residential energy efficiency charge will be placed in the Energy Efficiency Trust Fund. The Department of Commerce and Community Affairs (DCCA) administers the Energy Efficiency Trust Fund.

**Criteria:** The DCCA is to establish criteria and an application process for possible recipients of grants from the EETF. Eligible are projects that support energy efficiency efforts for low income households, upgrading to more efficient windows, appliances, or lighting, insulating dwellings and buildings, and other such projects as will increase energy efficiency in homes and rental properties. The DCCA is to conduct a study of other methods for promoting residential energy efficiency and conservation, especially for the benefit of low income customers.

\(^{26}\) Another source of some monies for low-income efficiency is the Supplemental Low-Income Energy Assistance Fund (SLIEAF), up to 10% of which may be used to supplement the state’s low-income weatherization program. DCCA also administers the SLIEAF, which is funded through electric and gas utility customer charges imposed since January 1, 1998 (residential accounts, $0.40/month; small commercial, $4/month; and large volume, $300/month). Charges for SLIEAF will be collected through the year 2002, at which point the energy assistance program will be reviewed by the Illinois General Assembly.
Implementation: Monies from the EETF will be disbursed through grants to projects or programs which the DCCA has determined will promote energy efficiency.

RENEWABLES

Structure: A charge per customer is being assessed for renewable energy resource and clean coal technology programs.

SBC Level: The following charges have been imposed since January 1, 1998:

- Residential electric and gas customer accounts: $0.05/month.
- Nonresidential electric and gas accounts, taking less than 10 MW of peak demand or 4 million therms of gas in the previous year: $0.50/month.
- Nonresidential electric and gas accounts, taking 10 MW or greater of peak demand or 4 million or more therms of gas in the previous year: $37.50/month.

Fifty percent of the funds go into the Renewable Energy Resources Trust Fund. The remaining 50% go into the Coal Technology Development Assistance Fund.

Collection Base: Funding for the renewable and coal programs is collected from all electric and gas utility customers. If municipal electric utilities and electric cooperatives elect to not impose the charge, their customers are not eligible for the Renewable Energy Resources Program.

Duration: Funds for renewable energy resources and coal technology are to be collected for a period of 10 years, beginning January 1, 1998.

Oversight: The Renewable Energy Resources Program and Trust Fund will be administered by the Illinois Department of Commerce and Community Affairs. Funds are subject to appropriation by the General Assembly.

Criteria: Renewable energy resources includes energy from wind, solar thermal energy, photovoltaic cells and panels, dedicated crops grown for energy production and organic waste biomass, hydropower that does not involve new construction or significant expansion of dams, and other such alternative sources of environmentally preferable energy. Energy from waste burning is explicitly excluded.

Implementation: Funds from the Renewable Energy Resources Trust Fund will be used to provide grants, loans and other incentives to foster investment in and the development and use of renewable energy resources.

Renewables Portfolio Standard: No RPS established.

Sources:
IOWA

The 1990 Alternative Energy Production Law requires a certain level of Iowa's energy mix be produced from renewable resources.

EFFICIENCY

In 1996, the state legislature lifted the requirement that investor-owned electric utilities invest 2% of their revenues in energy efficiency. Currently, investments in energy efficiency are determined by the Iowa Utilities Board.27

RENEWABLES

Renewables Portfolio Standard: The Alternative Energy Production Law of 1990 requires that 105 MW of Iowa's energy mix be produced from renewable resources. This is a total requirement, not a per utility requirement.28

Oversight: The Board of Public Utilities oversees the renewables requirement.

Criteria: Renewable energy resources includes wind, solar, biomass, and methane recovery.

Implementation: Electric utilities implement the renewables requirement.

Sources:


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27 If passed, a House Study Bill (HSB 218) on electric utility restructuring would establish an SBC to fund low income assistance and low income energy efficiency programs.

28 HSB 218 would establish a total RPS of 2% by 2006.
MAINE

The Maine Legislature passed House Bill 1804, which was signed into Law in May, 1997. This Act, which calls for restructuring of the State's electric industry, established a renewables portfolio standard. It also called for the Maine Public Utilities Commission (MPUC) to establish levels of funding for energy efficiency programs.

EFFICIENCY

**Funding Structure:** The MPUC has provided for a mills per kWh charge to fund energy efficiency programs.

**SBC Level- EE:** According to the Law, the MPUC is to establish a reasonable level of funding for conservation programs that is comparable to the amount expended for similar programs in the year 1999. The PUC is to regularly review the amount of funding needed. In January 1999, the PUC provisionally ordered the funding level to be set at a minimum of 1.44 mills/kWh. This funding level includes payments that are to be made from previous DSM bids, thus decreasing the amount available to pay for incremental energy conservation program activities. Due to this, distribution utilities may be ordered to spend additional amounts on incremental energy conservation programs.

**SBC Level- LI:** No separate charge is to be collected for low income energy conservation funding. However, the PUC has stipulated that a minimum of one-third of the annual conservation spending for new programs by each transmission and distribution utility is to be used for conservation programs that benefit low income customers.

**Collection Base:** Funds will be collected from all transmission and distribution utility customers as part of their utility rates.

**Duration:** Charges will be collected starting with the onset of retail competition (March 1, 2000) and will last initially for 3 years.

**Oversight:** The PUC is to establish guidelines for energy conservation programs and to regularly review the amount of funding needed.

**Criteria:** Conservation program spending for each of the three broad customer classes may not be less than 50% of that class's percentage share of total kWh sales. Conservation programs should target markets where a fully competitive market will not capture all energy efficiency opportunities, where resulting conservation measures are likely to result in economic benefits over their useful lives, and where the reduction of air or other pollutants will result in environmental benefits. Programs should be designed to satisfy the following objectives: transformation of markets; support research, development, and product demonstration that are likely to transform markets; ensure that all customer classes have a reasonable opportunity to participate in some form of energy conservation program; target low income customers; increase customer awareness of
energy efficiency opportunities; improve net environmental quality; and meet the limited societal test for cost-effectiveness.

**Implementation:** Energy conservation programs will be implemented by transmission and distribution utilities, following guidelines set by the PUC. Utilities will select energy efficiency service providers through periodic competitive bidding programs. The PUC is to approve utility requests for proposals.

**RENEWABLES**

**Funding Structure:** No mandatory charge for renewables funding was established, but the PUC is to establish a program allowing retail consumers of electricity to make voluntary contributions to fund renewable resource research and development.

**Renewables Portfolio Standard:** Each competitive electricity provider in Maine must demonstrate that no less than 30% of its portfolio of supply sources for retail electricity sales in the State are accounted for by new or existing renewable resources. No later than five years after the start of retail competition (March 1, 2000), the PUC shall review this requirement.

**Oversight:** The PUC is to administer the renewables portfolio standard.

**Criteria:** Renewable resource facilities are those whose total power production capacity does not exceed 100 MW and whose supply relies on one more of the following: fuel cells, tidal power, solar arrays and installations, wind power installations, geothermal installations, hydroelectric generators, biomass generators, and generators fueled by municipal solid waste in conjunction with recycling.

**Implementation:** Competitive electricity providers are to carry out the renewables portfolio standard requirements.

**Sources:**


MASSACHUSETTS

In 1997, Massachusetts enacted a law providing for electric utility restructuring. This Act establishes a system benefits charge (SBC) for energy efficiency, including low income energy efficiency, and renewable energy resources.

EFFICIENCY

Funding Structure: The Act specifies a mills/kWh charge to be collected from DISCO ratepayers for energy efficiency and low income demand-side management and education programs.

SBC Level- EE: 3.3 mills/kWh for 1998, 3.1 mills/kWh for 1999, 2.85 mills/kWh for 2000, 2.7 mills/kWh for 2001, and 2.5 mills/kWh for 2002.

Funding Level- Low Income: 20% of residential DSM budget, but minimum 0.25 mills/kWh of funds collected for energy efficiency must be spent on low income energy efficiency and education, including years after 2002.

Collection Base: All IOU distribution utility customers.

Duration: Charges were collected beginning with the start of retail competition (March 1, 1998). The energy efficiency surcharge is to be collected for an initial period of 5 years, except for the low income portion, which is to be collected indefinitely.

Oversight: The Massachusetts Division of Energy Resources (DOER) must approve programs and the Department of Telecommunications and Energy (DTE) must approve spending plans. The DTE is to administer the SBC. The DOER is to recommend whether energy efficiency funding shall continue beyond the year 2002. The DOER is to annually file a report with the DTE on proposed funding levels for energy efficiency programs.

Criteria: The Act requires that the SBC-funded energy efficiency programs be delivered cost-effectively and using competitive procurement of delivery services to the maximum feasible extent. The DTE initiated an investigation to establish cost-effectiveness standards and to consider other issues including measurement and evaluation, and incentives for utility shareholders.

Implementation: Distribution utility companies implement energy efficiency programs pursuant to their approved plans. The low income programs are implemented by the weatherization and fuel assistance program network and coordinated with all gas and electric distribution companies with the objective of standardizing implementation.

RENEWABLES

Funding Structure: The Act specifies a mills/kWh charge to be collected for renewable energy resource programs.
**SBC Level:** 0.75 mills/kWh for 1998, 1 mill/kWh for 1999, 1.25 mills/kWh for 2000, 1 mill/kWh for 2001, 0.75 mills/kWh for 2002, and 0.5 mills/kWh for 2003 and on.

Revenues collected through the renewables SBC go to the Massachusetts Technology Park Corporation and will support the Massachusetts Renewable Energy Trust Fund.

**Collection Base:** All IOU distribution utility customers and customers of municipal light plants that have opened their systems to competition.

**Duration:** Charges for renewables funding are to be collected beginning with the start of retail competition (March 1, 1998). They are to be collected indefinitely.

**Oversight:** The Massachusetts Technology Park Corporation administers the Massachusetts Renewable Energy Trust Fund.

**Criteria:** To be determined by the Massachusetts Technology Park Corporation with input from the Advisory Board mandated by the legislation.

**Implementation:** The Massachusetts Technology Park Corporation will select contractors to promote the increased availability, use, and affordability of renewable energy resources in the Commonwealth.

**Renewables Portfolio Standard:** The DOER is to establish an RPS for all retail electricity suppliers. By 12/31/99, the DOER shall determine the actual percentage of kWh sales to end-use customers which is derived from existing renewables. Every retail supplier shall provide a minimum percentage of kWh sales from new renewables according to the following schedule: (1) an additional 1% of sales by 12/31/03, or 1 year from final day of first month when average cost of any renewable is found to be within 10% of overall average spot-market price per kWh; (2) an additional 0.5% of sales each year thereafter until 12/31/09; (3) an additional 1% of sales every year thereafter until a date determined by the DOER.

**Oversight:** The DOER administers the RPS.

**Criteria:** For purposes of the RPS, renewable energy resources include the following after December 31, 1998: solar photovoltaic or solar thermal electric energy; wind energy; ocean thermal, wave, or tidal energy; fuel cells; landfill gas; and low emission, advanced biomass power conversion technologies.

**Implementation:** All electricity suppliers, whether IOUs or competitive entities, are to implement the RPS.

**Sources:**
Massachusetts Department of Telecommunications and Energy. *Investigation by the Department of Telecommunications and Energy on its own motion to Establish Methods and Procedures to Evaluate and Approve Energy Efficiency Programs.* DTE 98-100. January 9, 1999.
MINNESOTA

Minnesota has not restructured its electric and gas utility industries. Among the Minnesota Statutes current in 1998 (Statutes 216B.241, 216B.2422, 216B.2423, and 216B.2424) are provisions for mandatory expenditures on energy efficiency and mandates for generation of electricity by renewable energy sources.

EFFICIENCY

Funding Structure: Statutes call for utilities to spend a percent of their gross operating revenues on energy conservation.

SBC Level- EE: Investor owned utilities are required to spend a percent of their gross operating revenues from service provided in the state according to the following schedule:

- Gas utilities: 0.5%
- Electric utilities: 1.5%
- Electric utilities that operate a nuclear power plant within Minnesota: 2.0%

For an electric utility whose forecast projects a peak demand deficit of 100 MW or greater within five years, the Commissioner of the Department of Public Service (DPS) may require spending or investment amounts greater than the minimums above.

The funds collected by each public utility can be used in two ways. First, utilities must operate conservation improvement programs (CIPs). Second, each utility may contribute a portion of its required spending and investment to an energy conservation account used by the DPS to fund low-income efficiency programs or programs in areas not adequately served by the utilities’ CIP programs.

Cooperative electric associations and municipal electric or gas systems are to spend and invest for energy conservation improvements a percent of their gross operating revenues from service provided in the state as follows:

- Municipalities: 0.5%
- Cooperatives: 1.5%

SBC Level- LI: No specific funding requirements are mandated for low income programs. The Commissioner of the DPS is to ensure that a portion of the money spent on residential CIPs is devoted to programs that directly address the needs of low income persons. In addition, some of the funds contributed to the DPS conservation account by public utilities, municipalities, and electric cooperatives are to be used to meet the energy conservation needs of low income persons.

Collection Base: Utilities recover their expenses for approved conservation improvement programs. The law allows for annually adjusted cost recovery riders.

Duration: CIPs cover a two-year period.
Oversight: The DPS has primary review and approval authority for utilities’ CIPs as well as administrative responsibility for funds contributed to it by the utilities. DPS low-income programs are to be established with the consultation of political subdivisions and nonprofit and community organizations, especially those engaged in providing energy weatherization assistance to low income persons. The Public Utilities Commission (PUC) may modify or revoke DPS decisions concerning conservation programs if the PUC determines that a program is not cost effective, does not adequately address the residential conservation needs of low income persons, has a long-range negative effect on one or more classes of customers, or is not in the public interest. The party petitioning for PUC review has the burden of proof.

Criteria: Energy efficiency programs must be cost-effective, at least from the utility perspective; must include low-income conservation, and efficient lighting programs; and may include renewable resources within them.

Implementation: Each utility operates its own CIP. In addition, the DPS may contract with a political subdivision, a nonprofit or community organization, a public utility, a municipality, or a cooperative electric association to implement the programs.

RENEWABLES

SBC Level: CIP programs concentrate on efficiency. Though CIPs may include renewables, and the DPS Commissioner must require at least one public utility to establish a pilot program investing in energy from renewable resources, the CIP program is not a major support for renewables. For the most part, renewable resources are developed as part of the integrated resource planning (IRP) process overseen by the PUC.

Renewables Portfolio Standard: Each utility, as a part of its IRP filing, shall include the least cost plan for meeting 50 and 75 percent of all new and refurbished capacity needs through a combination of conservation and renewable energy resources. In addition, the PUC shall not approve a new or refurbished nonrenewable energy facility in an IRP or certificate of need unless the utility has demonstrated that a renewable energy facility is not in the public interest.

A public utility that operates a nuclear powered electric generating plant within Minnesota must construct and operate, purchase, or contract to construct and operate:

225 MW of electric energy installed capacity generated by wind energy conservation systems within the state by December 31, 1998.
An additional 200 MW of installed capacity generated by wind energy conservation systems within the state by December 31, 2002.
By December 31, 1998, 50 MW of electric energy installed capacity generated by farm-grown closed-loop biomass scheduled to be operational by December 31, 2001.
By December 31, 1998, an additional 75 MW of electric energy installed capacity generated by farm-grown closed-loop biomass scheduled to be operational by December 31, 2002.

Of the total 125 MW of biomass electric energy installed capacity, no more than 75 MW may be provided by a single project. A utility that operates a nuclear generating plant in the state must also construct and operate, purchase, or contract for an additional 400 MW of electric energy installed capacity generated by wind energy conservation systems within the state by December 31, 2002, subject to resource planning and least cost planning requirements.

**Oversight:** The PUC administers the renewable energy requirements.

**Criteria:** Renewable energy resources that can be included in least cost resource planning are wind, solar, geothermal, hydro, trees or other vegetation, and landfill gas. The incremental requirements for "nuclear" utilities require additional wind and biomass power to the extent not included already in a least-cost resource plan.

**Implementation:** Regulated electric utilities implement the renewables requirements.

**Sources:**


MONTANA

A Universal Systems Benefit Charge (USBC) has been adopted into Law by the Montana State Legislature for funding energy efficiency, low income programs and renewables.

EFFICIENCY

Funding Structure: Law calls for utilities to spend a percent of their annual retail sales revenues.

SBC Level- EE: Beginning January 1, 1999, 2.4% of each utility's annual retail sales revenue in Montana for the calendar year ending December 31, 1995, is established as the annual funding level for universal system benefits programs. Universal system benefits programs are established to ensure continued funding of and new expenditures for energy conservation, low income energy assistance (weatherization and other services), and renewable resource projects and applications.

SBC Level- LI: A minimum of 17% of each utility's annual universal system benefits funds collected must be spent on low income weatherization assistance and other energy assistance services.

Collection Base: Utilities can recover program costs through a universal system benefits charge assessed at the meter for each utility system customer. Customers with loads greater than 1,000 kW shall be charged the lesser of $500,000 or 0.9 mills/kWh.

Duration: Funding level remains in effect from January 1, 1999 until July 1, 2003.

Oversight: The Public Service Commission and the Transition Advisory Committee are to administer universal system benefits programs and spending. If a utility's credit for internal activities does not satisfy its annual funding requirement, then the utility must make a payment for any difference to the universal energy assistance fund.

Criteria: Each utility is to describe in its transition plan how it proposes to provide for universal system benefits programs, including the methodologies, such as cost-effectiveness and need determination, used to measure the utility's level of contribution to each program.

Implementation: Utilities are to implement universal system benefits programs, and are to submit annual summary reports of their activities relating to these programs to the Montana Public Service Commission and the Transition Advisory Committee.

RENEWABLES

Universal system benefits program spending, as described above, can include expenditures for renewable resource projects and applications.
Renewables Portfolio Standard: No RPS established.

Sources:

Note on the Pacific Northwest: Montana is the only one of the four Pacific Northwest states that has adopted an efficiency or renewables funding structure. Options are under discussion in the other states: Idaho, Oregon, and Washington. Individual regulated utilities in those three “unrestructured” jurisdictions pursue efficiency and renewables on a case-by-case basis in the context of IRP processes overseen by their regulatory commissions.
NEVADA

The Nevada Legislature passed into law on July 16, 1997, Assembly Bill No. 366 providing for restructuring of the State's electric utility industry. This law establishes a renewable portfolio standard.

EFFICIENCY

**SBC Level:** No public benefits charge was established for energy efficiency. The Public Service Commission ended the utilities’ previous DSM programs.

RENEWABLES

**SBC Level:** No public benefits charge was established for renewables.

**Renewables Portfolio Standard:** 0.2% of the total amount of electricity annually consumed by customers in Nevada must be derived from renewable energy resources as of January 1, 2001. This is to be increased every 2 years by 0.2% of the total amount of consumption by the customers until the standard reaches a total of 1% of the total amount of electricity consumed.

The portfolio standards must be derived from not less than 50% renewable energy resources and not less than 50% solar renewable energy systems.

**Oversight:** The Public Utilities Commission is to administer the portfolio standard.

**Criteria:** Renewable energy resources include wind, solar, geothermal and biomass energy resources in Nevada that are naturally regenerated. A renewable energy system must be an energy system in Nevada that utilizes renewable energy resources to produce electricity or solar thermal energy systems that reduce the consumption of electricity that was installed and commenced operations after July 1, 1997.

**Implementation:** Each vertically integrated electric utility and alternate seller that provides electric service in Nevada is to comply with the standard.

**Sources:**
NEW HAMPSHIRE

New Hampshire's restructuring statute (RSA 374-F, signed into law May 1996) provides the New Hampshire Public Utilities Commission (PUC) with the authority to establish a non-bypassable system benefits charge (SBC) to fund low income, energy efficiency, renewables, and other public purposes. In its Final Plan on Restructuring the Electric Utility Industry (DR 96-150, issued February 1997), the PUC authorized an SBC to be collected to fund a low income payment assistance program, but did not authorize such a charge to fund renewables or energy efficiency programs. In its Order on Rehearing (March 1998), the PUC suspended its initial decision to phase-out utility-sponsored energy efficiency programs and established an Energy Efficiency Working Group.

EFFICIENCY

**Funding Structure:** The PUC's Final Plan calls for the collection of a flat amount per kWh used to be collected for the purpose of funding a low income bill assistance program.

**SBC Level- EE:** No charge for general energy conservation has been established. A multi-party Energy Efficiency Working Group convened by the PUC is considering the issues and is expected to report to the PUC by July 1, 1999.

**SBC Level- LI:** The Final Plan on Restructuring approves funding for a low income bill assistance program up to 1.5 mills/kWh ($13.2 million total). However, this was for assistance not efficiency. An SBC for low income energy efficiency is also under consideration by the Energy Efficiency Working Group.

RENEWABLES

**SBC Level:** No charge for renewables has been established.

**Renewables Portfolio Standard:** No RPS has been established.

**Sources:**


NEW JERSEY

In 1999, the New Jersey Legislature passed Assembly Bill No. 16, restructuring the electric and gas utility industries in the State. The law calls for a societal benefits charge to be collected by utilities to fund energy efficiency, low income, renewables, and other specified programs. The law also provides for the establishment of a renewable portfolio standard, and allows for the establishment of an environmental portfolio standard.

EFFICIENCY

Funding Structure: For the first year after the restructuring law, the societal benefits charge is to be set to recover the same level of demand side management program costs as is being collected in the bundled rates of the electric public utility on the effective date of the act. During this first year, the Board of Public Utilities (BPU) is to review needs and determine the appropriate level of funding for energy efficiency and Class I renewable energy programs for the subsequent four years, and every four years thereafter.

SBC Level- EE: After the law has been in effect for one year, then no less than 50% of the total statewide amount being collected in public electric and gas utility rates for demand side management programs on the effective date of the act is to go towards energy efficiency programs for the subsequent four-year period. In the next four-year period after that, the funding for programs shall be the same as in the preceding four years, except that as additional funds are made available as a result of the expiration of past standard offer or similar commitments, the minimum amount of funding for such programs shall increase by an additional amount equal to 50% of the additional funds made available, until the minimum amount of funding dedicated to such programs reaches $140 million total. Thereafter, the BPU is to make a determination as to the appropriate level of funding for these programs.

SBC Level- LI: No separate funding levels are specified for low income energy efficiency programs, but the law requires that the BPU take into consideration making energy services more affordable for low income customers when decided the programs that are to be funded by the societal benefits charge.

Collection Base: The charge is to be collected from all electric distribution utility customers. The law allows the BPU to establish a gas SBC.

Duration: The societal benefits charge is to be collected for an initial period of nine years (1+4+4), at which point the BPU will determine the appropriate level of funding for energy efficiency and renewable energy programs.

Oversight: The BPU is to administer the societal benefits programs, determining levels of funding, which programs to fund, and levels of cost recovery and performance incentives allowed to be recovered by public utilities.
Criteria: The BPU is to take into consideration existing market barriers and environmental benefits, with the objective of transforming markets, capturing lost opportunities, making energy services more affordable for low income customers and eliminating subsidies for programs that can be delivered in the marketplace without funding.

Implementation: Energy efficiency programs may continue to be implemented by distribution utilities.

RENEWABLES

Funding Level: 25% of the amount being collected through the SBC for energy efficiency is to go towards a renewable energy program.

Criteria: This program is to provide financial incentives for the installation of Class I renewable energy projects in the State. The renewable technologies eligible for these incentives shall include, at a minimum, photovoltaic, wind and fuel cells.

Renewables Portfolio Standard: Assembly Bill No. 16 calls for the establishment of renewable energy portfolio standards. The first standard requires that 2.5% of the kWh sold in NJ by each electric power supplier and each basic generation service provider are to be from Class I or Class II renewable energy sources. The second standard requires that, beginning January 1, 2001, 0.5% of the kWh sold are to be from Class I renewable energy sources. This amount is to increase so that by January 1, 2006, it reaches 1%, and shall additionally increase by 0.5% per year until January 1, 2012, when it reaches 4%.

The law also allows for an Environmental Portfolio Standard by authorizing the BPU to include an environmental emissions portfolio standard in the licensing requirements for competitive electricity suppliers.

Oversight: The BPU and the Department of Environmental Protection administer the RPS.

Criteria: Class I renewable energy is defined as electric energy produced from solar technologies, photovoltaic technologies, wind energy, fuel cells, geothermal technologies, wave or tidal action, and methane gas from landfills or a biomass facility, provided that the biomass is cultivated and harvested in a sustainable manner.

Class II renewable energy is defined as electric energy produced at a resource recovery facility or hydropower facility, provided that such facility is located where retail competition is permitted and provided further that the Commissioner of Environmental Protection has determined that such facility meets the highest environmental standards and minimizes any impacts to the environmental and local communities.

Implementation: Electricity suppliers are to implement the RPS.
Sources:
NEW MEXICO

The New Mexico Electric Utility Industry Restructuring Act of 1999 was signed into law in April 1999. The Act establishes a System Benefits Charge to be collected for consumer information, low income customer programs, and renewable technology development.

EFFICIENCY

Funding Structure: The law sets a mills per kWh charge, part of which is to fund low income energy efficiency.

SBC Level- LI: 0.3 mills/kWh.

Collection Base: The charge is to be collected from all public utility customers and distribution cooperative utility customers in the state.

Duration: The SBC is to be collected beginning January 1, 2001. No end date was specified.

Oversight: The Department of Environment.

Criteria: No less than $500,000 annually is to be spent on low income weatherization programs and other low income energy assistance.

Implementation: The Department of Environment is to manage, administer, and maintain the funds collected from the SBC.

RENEWABLES

Funding Structure: The law sets a mills per kWh charge, part of which is to fund low income energy efficiency and renewable energy projects.

SBC Level: 0.3 mills/kWh.

In addition to the SBC, the Public Regulation Commission (PRC) has approved a per kWh charge for residential customers of Public Service Company of New Mexico (PNM) to fund a 5 MW solar generating plant.

Criteria: No more than $4 million annually is to be spent to encourage the use of renewable energy through the initiation, development, and evaluation of renewable technology projects.

Renewable energy means electrical energy generated by means of a low- or zero-emissions generation technology that has a substantial long-term potential and may include, without limitation, solar, wind, hydropower, geothermal, landfill gas,
anaerobically digested waste biomass, or fuel cells that are not fossil fueled. It does not include fossil fuel or nuclear energy.

**Renewables Portfolio Standard:** No RPS has been established.

**Sources:**

NEW YORK

The State of New York Public Service Commission (PSC), in Opinion No. 98-3, has established policies for the administration of “System Benefits Charge” (SBC) funds that will be used to promote energy efficiency and public policy programs during the transition to a competitive electric industry. The Order was issued January 30, 1998.

EFFICIENCY

Funding Structure: The Order stipulates total dollar amounts to be spent on System Benefits programs. A total of $234.3 million will be collected over a 3-year period beginning July 1, 1998, by the six investor-owned utilities in the state. The funds will be used for energy efficiency, research and development, environmental protections, and low income.

SBC Level- EE: Of the total funds collected, $161.57 million will be spent on energy efficiency.

SBC Level- LI: $29.3 million will be spent on low income energy conservation and aggregation programs.

Collection Base: The collection of the System Benefits Charge in the rates of each utility will be as established in the individual utility rate and restructuring proceedings.

Duration: The SBC is to be collected for an initial period of three years, beginning July 1, 1998. At a future date, the Commission will review the programs to determine whether they should be continued beyond the transition period.

Oversight: The PSC must approve plans to utilize the public benefit funds. The Commission’s Order designates the New York State Energy Research and Development Association (NYSERDA) as a third-party administrator for SBC funds. NYSERDA is a long-established public benefit corporation that conducts a wide range of energy research, development, and demonstration projects and programs. NYSERDA has worked closely with PSC Staff to file a comprehensive plan that has been approved by the Commission, after some modifications.

Criteria: Energy Efficiency programs should promote participation by residential and small commercial customers. Low Income programs need to target those geographic areas not served by utility-run low income programs.

Implementation: Contracts for the majority of SBC programs will be carried out on the basis of competitive solicitations for which all qualified parties are eligible to compete, including utilities.
Utilities will extend their most cost effective existing programs until programs funded by the SBC are operational, or for as long as is permitted by their appropriated but unexpended funds for such programs.

Funding will be available for utilities to complete their existing program commitments, as well as for those programs that the Staff feels would be more effectively implemented by the utilities.

RENEWABLES

Funding Structure: The Order establishes total dollar amounts to be spent on R&D. Eligible R&D and demonstration projects include renewable energy.

SBC Level: $40.43 million is to be spent on R&D.

Renewables Portfolio Standard: No RPS established.

Sources:


The General Assembly of Pennsylvania passed into Law the Electric Generation Customer Choice & Competition Act in December 1996. This Act calls for the continued implementation of universal service and energy conservation policies, activities and services that help low income customers. There are no provisions for funding energy efficiency other than for low income customers. Specific amounts are to be proposed in individual utility restructuring plans.

**EFFICIENCY**

**Funding Structure:** Total annual dollar amounts to be spent on low income energy conservation and other services are stipulated for each utility in that utility's restructuring plan. There is no provision for general energy efficiency.

**SBC Level- Low Income:** The annual funding levels for each of the investor-owned utilities for low income weatherization and energy conservation programs is as follows:

- Duquesne Light Co., 1999- $1 million; 2000- $1.25 million; 2001- $1.5 million; 2002- $1.75 million.
- Metropolitan Edison Co., 1999- $1.23 million; 2000- $1.4 million; 2001- $1.6 million; 2002- $1.83 million.
- PECO, annual funding level is set at $5.6 million.
- Pennsylvania Electric Co., 1999- $0.972 million; 2000- $1.32 million; 2001- $1.64 million; 2002- $1.96 million.
- Pennsylvania Power Co., 1999- $180,000 ramping up to $645,250 in 2002, where it remains until cost-effective opportunities for electricity savings in low income homes are exhausted.
- Pennsylvania Power & Light Co., 1999 and on- $4.7 million.
- West Penn Power Co., 1999- $1.02 million; 2000- $1.45 million; 2001- $1.9 million; 2002- $2.20 million.

**Collection Base:** Except for Duquesne Light Co., the Universal Service Fund Charge (USFC) for all utilities will be allocated only to the residential class and charged on a per kWh basis. Duquesne is to allocate and collect the USFC by rate class on a cents per kWh basis based on allocated distribution costs for each rate class. For all utilities, the USFC will be included in the distribution portion of customers' bills, not as a separate line item.

**Duration:** The universal service and energy conservation programs were to last initially for a 4-year period, beginning on January 1, 1999.

**Oversight:** The Public Utility Commission is to administer the universal service and energy conservation programs.

**Criteria:** The PUC is to ensure that programs and services are available in each electric distribution territory, and that they are operated in a cost-effective manner.
**Implementation:** Universal service and energy conservation programs are to be implemented by the individual utilities under the approval of the Public Utility Commission.

**RENEWABLES**

**SBC Level:** Duquesne is required to participate in the US Department of Energy's "Million Solar Roof Program" with an annual funding levels of $250,000. These costs are recovered from the Universal Service Fund Charge.

PECO, Pennsylvania Power & Light, Metropolitan Edison, Pennsylvania Electric, and West Penn Power are all to develop a renewable pilot program, also to be funded through the USFC.

There are no specific renewable requirements for Pennsylvania Power Company.

**Administration:** The DOE and the Utility Photovoltaic Group collaborative administer the Million Solar Roof Program, with regulatory oversight by the PUC. The PUC administers renewable pilot programs.

**Criteria:** The Million Solar Roof Program is specifically designed to accelerate commercialization of photovoltaic systems by increasing the economy of scale of production.

**Implementation:** The Million Solar Roof Program includes federal grants and consumer loans to finance customer installation of photovoltaic systems on their roofs. Individual utilities will implement renewable pilot programs.

**Renewables Portfolio Standard:** No RPS established.

**Sources:**


RHODE ISLAND

The Rhode Island restructuring law passed in 1996 included a charge for energy efficiency and renewables.

EFFICIENCY

Funding Structure: The law stipulates a minimum mills/kWh charge to fund energy efficiency and renewables.

SBC Level- EE: A minimum of 2.3 mills/kWh is to go for demand-side management programs and renewable energy resources. This charge can be exceeded. It was originally expected to raise $15 million annually. In 1998, the charge was expected to raise $19.9 million.

Total funding for programs in 1998 for one company, Narragansett Electric Company, was $15.68 million and the 1999 total program budget is to be $16.6 million. Expenditures for the demand-side management component of programs were $14.8 million in 1998 and are to be $15.7 million in 1999.

Collection Base: Electric distribution utility customers.

Duration: The charge is to be collected for a period of 5 years, which started January 1, 1997.

Oversight: The RI Public Utilities Commission (PUC) is to administer the funds collected through this charge. During the 5-year initial period, the Commission may increase the sums for DSM and renewables. After this period, the Commission is to determine the appropriate charge for these programs.

Criteria: Fuel cells may be considered an energy efficiency technology to be included in demand-side management programs.

Implementation: Utilities implement programs. Once programs are designed, a competitive process will be used to select contractors to carry out the programs.

RENEWABLES

SBC Level: In 1997, a small fraction of the funds collected from the system benefits charge were to go to renewables. Over time, the renewables share of the funds will increase. $1.3 million of the funds collected in 1998 were to go to renewables. For Narragansett Electric, expenditures for renewables were $800,000 in 1998 and are to be $900,000 in 1999.
Criteria: Renewable energy resources include wind energy, hydropower plants that are 100 MW or less and that do not require construction of new dams, solar energy and sustainably managed biomass.

Renewables Portfolio Standard: No RPS established.

Sources:


VERMONT (Proposed Only)

Programs and funding levels for a System Benefits Charge (SBC) have been incorporated into legislation, which has to date passed the Senate as Senate Bill S-62. As of May 1999 it had not been passed by the House.

The Department of Public Service (DPS), Central Vermont Public Service (CVPS), and Green Mountain Power (GMP) have submitted a plan to create a state energy efficiency utility (EEU) to the Public Service Board (PSB) for its review. The plan calls for the collection of a "special benefits charge" to fund the EEU.

EFFICIENCY

SBC Level- EE: The annual level of funding to go towards new demand-side management (DSM) research and development would be $14.5 million.

Under the more recent DPS plan for creating an EEU, the EEU would have an $8.4 million budget in 2000. This would rise to $16.5 million in 2004. Of this proposed budget amount, CVPS would be accountable for $3.5 million in 2000, $4.6 million in 2001, and $5.5 million in 2002. GMP would be accountable for $2.5 million in 2000, $3.3 million in 2001, and $4.2 million in 2002. The utilities will collect the funds from all customers through a special benefits charge. The plan calls for passage of a state law to approve the charge on customers.

Duration: The funds in the Senate bill would be collected through 2000. Beginning January, 2001, and annually thereafter, the charge would be set by Order or Rule of the board and adjusted as required in accordance with law.

Administration: Proceeds of the energy efficiency charge in the Senate Bill would go to a System Benefits Administrator, who would pay to the EEU the amounts ordered by the board. The funds collected from the charge created by the EEU plan would be turned directly over to the EEU by the utilities.

Criteria: Programs run by the EEU will be delivered to all retail customers in the state and will replace similar programs now run by the individual utilities.

Implementation: The EEU named to implement programs would be a corporation certified by the board and selected by a competitive application process. The EEU’s term would be up to 5 years, and could be renewed by the board.

RENEWABLES

Funding Structure: Senate Bill S-62 calls for the PSB to establish a "renewable energy technology charge" to support development and commercialization of new renewable technologies. S-62 also calls for the creation of the renewable and sustainable energy
fund, a specified annual dollar amount to be spent on renewable energy research and development.

**SBC Level:** The level of the renewable energy technology charge is not specified. Annual appropriations for the renewable and sustainable energy fund to promote research, development and demonstration programs proposed in Bill S-62 are $500,000.

**Administration:** Funds collected from the renewable energy technology charge would be administered by the System Benefits Administrator. Funds collected from the renewable and sustainable energy fund would be administered by the DPS.

**Criteria:** A renewable technology is one that relies on a resource being consumed at a harvest rate at or below its natural regeneration rate. Included in this definition are methane gas and other flammable gases produced by the decay of landfill and agricultural wastes. Resources not considered renewable include forms of solid waste other than agricultural or silvicultural waste, and any form of nuclear fuel.

A technology could be considered renewable, even for installations currently using nonrenewable fuels, if the PSB found all of the following: the technology is an emerging technology that holds special promise for enabling or enhancing the future sustainable use of renewable resources; the technology is significantly less polluting than existing technologies for using similar fossil fuels; the technology is not in widespread use for utility applications, will be readily convertible to renewable fuels, and is significantly less expensive with fossil than renewable fuels; and the use of the technology with fossil fuels will accelerate its use with renewable fuels.

**Implementation:** Programs that identify, improve and promote renewable and sustainable technologies would be planned and implemented by the Department of Public Service.

**Renewables Portfolio Standard:** Senate Bill S-62 would establish a two-tier renewable portfolio standard:

Tier 1 renewables would be at least equal to that proportion of the retail electric consumption and associated transmission and distribution losses in 1995 that met the standard for Tier 1.

Tier 2 renewables would increase each year, beginning in 1998, and in the year 2007 would equal at least 4% of Vermont retail electric consumption and associated transmission and distribution losses in that year.

**Oversight:** The PSB would administer the portfolio standards.

**Criteria:** Tier 1 renewables would be any renewable and sustainable electric generation technology employed at a specific generating facility that has a capacity under 80 MW. Tier 2 renewables would be those that meet criteria for Tier 1 and have been found by the
PSB to be a renewable, sustainable and emerging electric generating technology and that is employed at a facility that began service no earlier than January 1, 1999 or that was not built before July 1, 1998.

**Implementation:** Electricity providers are to implement the portfolio standards.

**Sources:**

WISCONSIN

In accordance with the Wisconsin Public Service Commission's (PSC) 32-Step Workplan on restructuring the electric utility industry, the Commission presented before the Wisconsin Legislature its proposal for Public Benefits programs. This proposal suggested levels of funding for energy efficiency, low income, and renewables programs.

The Wisconsin Legislature passed Act 204 on April 28, 1998. This Act establishes a renewable energy source requirement.

EFFICIENCY (Proposed)

Structure: The PSC proposal stipulates total annual dollar expenditures for energy efficiency and low income programs.

SBC Level: Proposed annual Public Benefit funding levels for energy efficiency, renewables, and low income programs totals $164 million. (Note: total proposed annual funding for these three initiatives is $210 million. The Commission assumes, however, that $46 million for low income programs will come from federal funding. Proposed annual funding of $2 million for environmental research is not included in these totals.)

SBC Level- EE: Proposed annual funding for Public Benefits energy efficiency programs is $100 million. This level of funding is comparable to that currently being spent by Wisconsin utilities at the time of the proposal. Funding levels in future years is to be based on the level of market transformation that has been accomplished by the Public Benefits programs. It is the hope of the Commission that a sufficient level of market transformation will occur after a few years such that funding is no longer required at that time.

SBC Level- LI: Of the $105 million the Commission proposed for initial annual funding of low income programs, a minimum of $50 million per year is to be spent on low income weatherization and energy efficiency efforts. (The Commission assumes that $46 million of total low income funds will come from federal funding and thus the remaining $59 million will have to come from Public Benefits funding. There is no breakdown proposed as to what shares the federal and Public Benefits funds will contribute to the weatherization and energy efficiency programs.)

Collection Base: Costs will be recovered from utility customer classes through the Commission's existing rate setting process.

Duration: The Commission recommended that the Legislature establish a sunset for energy efficiency Public Benefit funding five years after the effort is established.

Public Benefits funding for low income programs is recommended to be permanent.
Administration: The Commission recommends establishing two separate administrative structures: one for low income programs and one for energy efficiency and renewables programs.

State agencies will be responsible for adjusting total funding levels from year to year, and for allocating funds between program area over time, based on assessments of need.

Criteria: Energy efficiency programs should strive to transform markets, deliver energy efficiency services where market failures continue to exist, educate consumers on energy efficiency markets, and perform research in support of programming and market development.

Low income energy efficiency and weatherization programs should improve the affordability, quality, and safety of low income housing, and reduce the amount of energy consumed for end-uses such as space heating, water heating, and lighting.

Implementation: Program design and implementation would be performed by an administrator (specifications on administrator selection were not identified). The administrator could perform the work directly or subcontract it through a competitive Request for Proposal process. State agencies would contract with, and direct the work of, the administrator.

RENEWABLES (Proposed)

Structure: The PSC proposal stipulates total annual dollar expenditures for renewable energy programs.

SBC Level: The Commission proposes an overall initial need of $5 million per year to promote renewable energy resources.

Collection Base: Costs will be recovered from customer classes through the Commission's existing rate setting process.

Duration: The Commission recommends that the Legislature establish a sunset for renewable energy Public Benefit funding five years after the effort is established.

Administration and Implementation: Same as for energy efficiency.

Criteria: Renewable energy programs are to concentrate on the development of customer-sited renewable energy applications and small-scale, customer-sited renewable generation technologies. They should also educate consumers on small renewable resource markets.

RENEWABLES (Enacted)
**Renewables Portfolio Standard:** According to Act 204, utilities in eastern Wisconsin are to construct, or procure construction of, new electric capacity totaling 50 MW that is generated from renewable energy sources. Each eastern utility shall construct or procure construction of a share of the total corresponding to that utility's share of the aggregate demand for electricity that is supplied by the utilities in Wisconsin. This is to happen no later than December 31, 2000.

**Administration:** The PSC is to administer the portfolio standard.

**Criteria:** This standard is for new, incremental renewable energy sources.

**Implementation:** Eastern Wisconsin utilities are to implement the standard.

**Sources:**