



SUCCESSFUL UTILITY-
SECTOR ENERGY
EFFICIENCY PROGRAMS IN
THE UNITED STATES OF
AMERICA

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INTRODUCTION

With the assistance of the American Council for an Energy-Efficient Economy (ACEEE), the Sierra Club of Canada has developed this report to highlight what we have determined to be the most successful examples of energy efficiency programs in the United States of America.

We have selected five states that represent truly excellent examples of energy efficiency policies and programs. These states include: California, Massachusetts, Minnesota, New York, and Vermont. Because of similarities between Canadian and U.S. economies, energy use and technology, the success and policies behind each of these states' conservation programs should be of the utmost interest to Canadian provinces developing their own energy conservation policies. We hope the profiles for each of these states will be of use to both decision-makers and concerned Canadians.

As it happens, these states also represent a nice mix of public policy approaches to delivering utility-sector energy efficiency programs, ranging from traditional vertically-integrated utility companies (Minnesota), to distribution utilities in "restructured" states (California and Massachusetts), to a dedicated state agency (New York), to a specialised independent non-profit organisation (Vermont).

Each of these states has been very successful, which confirms one of ACEEE's major conclusions from their extensive research in this field:

"A significant corollary lesson is that there does not appear to be any single "correct approach" for the design of such a system. Some states are having success with utility administered programs (e.g., Massachusetts, Connecticut, and California) while others are succeeding with programs administered by state agencies (e.g., New York and Illinois) or even by an independent entity selected by an RFP (e.g., Vermont).

This translates into what might be the primary strategic and tactical lesson of the study—once having met an overall policy threshold of having public benefit funding support for energy efficiency, each state should take advantage of its own strengths and assets in designing the specific details of its energy efficiency policy implementation approach." [Kushler & Witte, 2000 b, p.23]

Ontario and other Canadian provinces would benefit from considering the experiences and lessons learned in these and other states, in addition to a careful assessment of Ontario's internal institutional resources and strengths, as it designs its own approach to utility-sector energy efficiency policies and programs.

CASE STUDY: CALIFORNIA

Program Background and Structure

California is without question the leading state in the U.S. when it comes to aggressive energy efficiency policies. They have been national leaders for over two decades in three vital areas of energy efficiency policy: building codes; appliance standards; and utility energy efficiency programs. In fact, the synergistic effects of these efforts has resulted in California electricity consumption per capita remaining essentially level since the OPEC oil embargo in the mid-1970's, while U.S. per capita electricity consumption has risen nearly 50 percent. This cumulative effect has literally resulted in California homes and businesses now saving over \$4 billion per year in electricity costs over what they would be spending had they not achieved these efficiencies.

With respect to utilities in particular, California has had strong regulatory requirements for utility energy efficiency programs since the late 1970s. In 1996 California passed its restructuring legislation (AB 1870) which also created a non-bypassable public goods charge (PGC) to fund energy efficiency programs (providing approximately \$250 million per year). This was supplemented with temporary additional direct legislative funding of roughly \$900 million for energy efficiency and demand reduction during the electric crisis of 2000/2001 (see below). Most recently, the California Public Utilities Commission has re-established the utility responsibility for procuring a reliable supply of electricity for the state's customers, and as a part of that "procurement" process the CPUC has approved an additional \$125 million per year for acquiring energy efficiency (on top of the existing PGC funding).

Program Results

California also has the most extensive history of program evaluation of their energy efficiency programs of any state. There are literally scores of detailed evaluation reports available from over the years. Most remarkable, however, are the well-documented results of California's extensive conservation and energy efficiency efforts during their 2000/2001 electricity crisis.

By almost any measure, the events surrounding the electricity situation in California in the 2000/2001 time period were simply extraordinary. Between the summer of 2000 and the early winter months of 2001, the California Independent System Operator declared over 70 days of system emergencies, and rolling blackouts were actually initiated on several occasions. In January and February 2001, the California Energy Commission (CEC) projected electricity supply and demand for the summer of 2001 under various temperature scenarios, and analyses suggested that the State could face a potential shortfall of 5,000 megawatts during the months of June through September.

In reaction to this unprecedented "electricity crisis", California responded with a series of demand-side policy initiatives that were truly historic. California policymakers and utility regulators established a substantial set of policies and programs that involved significant additional funding for energy efficiency programs and the development of a major public information campaign to promote energy

conservation. In all, more than \$1.3 billion in funding was authorised for demand reduction initiatives, representing a 250% increase over the spending in 2000. In particular, the degree of policy emphasis and the amount of funding provided for energy efficiency were without parallel in U.S. history.

By the broadest indicators, the totality of this effort was extremely successful. The synergistic effect of all the California programs and policies was immense. In 2001 California averaged a 10% cut in peak demand during the summer months (with a record reduction of 14% in June), and overall electricity use declined in 2001 by 6.7%, after adjusting for economic growth and weather. These energy efficiency and conservation efforts reduced peak demand by 5,500 MW, more than the entire originally projected shortfall. Perhaps the most meaningful result of all was that California experienced no incidences of rolling blackouts for the entire summer or the rest of 2001. Subsequent detailed evaluation of these efforts also determined that they were very cost-effective, saving electricity at an average cost of 3 cents per kWh (less than half the cost of building, fuelling and operating new electric power plants).

The experience in California in 2000/2001 irrefutably demonstrated that an aggressive policy response consisting of a major public information campaign for energy conservation, coupled with expanded funding for the direct implementation of energy efficiency measures, could achieve significant energy demand reductions and a very cost-effective price. Furthermore, it could do so in a very short time frame, when there was not sufficient time to pursue traditional supply-side capacity expansion. It is not an overstatement to say that energy efficiency and conservation literally “kept the lights on” in California during the electricity crisis of 2001.

Reasons for Exemplary Performance

California is the leading state example for a comprehensive policy focus on energy efficiency. Key factors in its success include:

- Consistent, aggressive public policy requirements for energy efficiency over many years, upheld by successive governors and legislatures in the state.
- Substantial and consistent funding support for utility energy efficiency over many years, which has provided assurance and certainty that energy efficiency programs will persist.
- The presence of the above factors has allowed the development over time of a very skilled work force of energy efficiency professionals, as well as experienced trade allies (contractors, retailers, distributors and manufacturers of energy efficiency products and equipment). The existence of this infrastructure was a very important factor in enabling California to achieve the dramatic energy savings witnessed in the 2000/2001 crisis.
- California utilities have also been particularly noteworthy for their willingness to support and provide energy efficiency programs. Factors that have contributed to this include a strong regulatory emphasis on energy efficiency and the judicious use of financial incentives for the utilities during much of this time. This has helped lead to the development of a skilled and dedicated energy efficiency work force within the utilities, which has helped sustain institutional momentum over the years.

CASE STUDY: MASSACHUSETTS

Program Background and Structure

Massachusetts has a long history with utility energy efficiency programs, which comprise an integral resource within utility resource portfolios. Massachusetts' utilities performed integrated resource planning throughout the 1980s and early 1990s, which yielded a wide variety of demand-side management programs as a means to avoid construction of new generating plants and achieve "least-cost" energy resources. During this period, the energy efficiency programs in Massachusetts secured significant economic and environmental benefits. Utilities also gained valuable experience operating programs and customers learned to turn to their utilities for programs and services to reduce their energy costs through energy efficiency.

As Massachusetts restructured its electric utility industry in the late 1990s, the state enacted a "systems benefits" policy to assure continued funding of utility energy efficiency programs in recognition of the numerous benefits of energy efficiency to customers, the economy and the environment. This requirement was enacted as part of the Electric Industry Restructuring Act (St. 1997, c. 164). Energy efficiency and low-income programs are funded by a monthly charge (system benefits charge) on customers' electric bills (approximately \$0.0025/kWh) that is collected by all distribution utilities.

The distribution utilities administer their own energy efficiency programs with collaborative input and oversight from the state Division of Energy Resources (DOER) and the Department of Telecommunications and Energy (DTE). A stakeholder collaborative (energy service companies, low-income groups, the Attorney General's office, large industrials, environmentalists, etc.) is key to program development, and is responsible for reviewing and approving program plans and budgets as the first step in final program authorisation. DOER and DTE then review the plans and make final program and budget decisions.

All of the distribution utilities are eligible for performance incentives. The incentive is established by the DOER and represents approximately 4.75% of the cost of each program. The company has to achieve a pre-established level of energy savings to achieve the incentive. The incentive is based on a program-by-program basis, not an "all or nothing" mechanism.

Program Results

In its required annual report to state government, DOER estimated that the 2001 Massachusetts' programs resulted in lifetime energy savings of 4,571 million kWh—a value of \$332 million in total savings for program participants. The program costs and savings translate into an average cost of conserved energy of \$.04/kWh, which compares very favourably to the estimated average retail price of electricity of \$.0968/kWh over the same period. Total annual program participation was 10 percent. The programs were highly cost-effective, with a total benefit-cost ratio for all programs of 2.5. Greater energy efficiency also has significant economic benefits due to reduced customer costs for energy. DOER also estimates that 2,264 jobs were created from the economic impacts of the programs.

Reasons for Exemplary Performance

Utilities in Massachusetts are recognised as national leaders for their effective energy efficiency programs. The programs were able to sustain their considerable momentum and continue to operate without disruption or significant change through the state's industry restructuring. Reasons for its success include:

- The programs have enjoyed consistent, significant support from regulators and state government. Funding has been consistent, even through industry restructuring.
- The programs have established and rely on a broad constituency for guidance and support. Program designs are guided by a collaborative of diverse stakeholder groups.
- Top utility management has provided strong support for energy efficiency programs. Utility executives have seen the programs' strategic value. Policy makers, in turn, have established performance incentives as concrete mechanisms to reward the utilities for superior performance and send a strong signal to utility management of the importance of these programs.
- Programs are developed and implemented with clearly established objectives. Evaluation is a critical and integral element of program operation to monitor and assess performance toward established objectives.
- Cost-effectiveness of programs is one strong objective, and programs are subject to rigorous evaluation to ensure that they are meeting this objective.
- Utilities offer a wide menu of programs that serve all types of customers and provide a comprehensive menu of services, including financial incentives, technical assistance, marketing, customer information, and training.
- Programs work with key market allies—retailers, contractors, manufacturers, and others—to work within markets, not independently of the markets. The utilities perform and rely on market research to understand their target markets and identify the most effective solutions to address identified customer needs.
- The programs work to balance both short- and long-term savings. Some programs and services address immediate market decisions and customer needs, while other programs work to achieve long-term market change in terms of products and services.
- The programs work to achieve an equitable balance of funding for programs among the many different customer segments. Energy efficiency programs and services are available to serve all kinds of customers.
- The programs have built on a solid record of achievement and experience, and continue to innovate and evolve to meet changing conditions and new customer needs.
- While each individual utility is responsible for its own programs, the utilities benefit from joint co-ordination and collaboration, not only in the state with other utilities, but within the entire Northeast through participation in the Northeast Energy Efficiency Partnerships, a regional market transformation organisation.

CASE STUDY: MINNESOTA

Program Background and Structure

Minnesota is an excellent example of energy efficiency being provided by vertically integrated utility companies. Minnesota has a long history of public policy support for energy efficiency, including legislation established in the early 1990s requiring all electric utilities to spend 1.5% of gross operating revenues each year (2.0% in the case of the state's largest electric utility) on energy efficiency programs. (Natural gas utilities are also required to spend at least 0.5% of their operating revenues on energy efficiency.)

Utilities are required to file "Conservation Improvement Plans" every two years that outline their proposed budgets and program plans for the next two years. These plans are reviewed and approved by the state's regulatory agency after a public comment process. The utilities are eligible to earn a financial incentive for their shareholders if their energy efficiency programs achieve certain designated savings goals. The utilities in Minnesota are also required to file integrated resource plans, which must take into consideration energy efficiency as a part of meeting their overall resource needs.

Program Results

The state's largest electric utility (Xcel) has a good history of evaluation and reporting of their program costs and impacts, so it is easiest to look at their performance. On average, they have been spending nearly \$35 million per year on energy efficiency and have been achieving annual savings of approximately 175 GWh and 80 MW per year. Overall cost-effectiveness of their programs has been excellent, with an average cost of conserved energy of less than \$.02 per kWh.

Reasons for Exemplary Performance

Minnesota is perhaps the best example of solid policy support for utility energy efficiency in a non-restructured state.

- The cornerstone of Minnesota's success is their clear legislative requirement for a significant level of utility spending on energy efficiency programs for customers (as described above). This avoids confusion and continual re-arguing of the need for energy efficiency funding before the regulatory agency, and creates a level of certainty that allows for long-term planning.
- Minnesota also has a well-developed process for filing, public input, and regulatory review for energy efficiency program plans.
- The incentive mechanism for utilities, together with strong state oversight, helps keep utilities motivated to do a good job with their energy efficiency programs.
- One particular leading utility (Xcel) has had a noteworthy level of management support and co-operation for its energy efficiency efforts, dating back to its earlier days as Northern States Power. The experience and dedication of their staff have been very helpful to sustaining effective energy efficiency programs in Minnesota.

CASE STUDY: NEW YORK

Program Background and Structure

Through the 1980s and early 1990s, investor-owned utilities in New York offered DSM programs that were overseen by the New York Public Service Commission (PSC). In the late 1990s New York took steps to restructure its electric utility industry to allow retail competition. In conjunction with New York's restructuring, in January 1998 the PSC issued Order 98-3, which established an initial 3-year systems benefits charge (SBC) and designated the New York Energy Research and Development Authority (NYSERDA) as the independent 3rd-party administrator for this state-wide program ("state-wide" with the exception of two public utilities—the New York Power Authority and the Long Island Power Authority; each of these run their own programs). NYSEDA, as a state government authority, is part of the state government.

NYSERDA is a unique organisation among the states. It was established by law in 1975 to promote energy efficiency, while protecting the environment. Historically NYSEDA's main focus was energy research and development to achieve greater energy efficiency and environmental improvement. With the PSC Order 98-3, NYSEDA took on a much larger role than research and development, however. It became the administrator of the newly created systems benefits programs for energy efficiency, low-income services and R&D. NYSEDA administers the programs, typically relying on contractors and other private sector entities to deliver the program services, while its own staff principally manages the programs. The system benefits fund is renewed at the discretion of the New York Public Service Commission and it is reviewed periodically.

The state-wide programs have three main areas--energy efficiency, R&D and low-income. The energy efficiency program area includes market transformation (including upstream initiatives, financial assistance, new construction, and residential building performance initiatives), energy services industry programs (standard performance contracts, financial packaging services) and technical assistance and outreach programs. Total funding for SBC programs was about \$234 million--about \$78 million/year. Of this total, about \$162 million was for energy efficiency. In June 2001 the PSC extended the SBC program for another 5 years, beginning 7/01 and ending 6/06. In Case No. 94-E-0952, the Commission issued its Order on January 26, 2001, which increased the system benefits to approximately \$150 million/year for July 1, 2001 to June 30, 2006.

There is an advisory group that functions to oversee independent evaluation of the SBC programs. This group participates in developing the overall evaluation plan and is responsible for reporting to the PSC on the status and results of the public benefits program.

Program Results

An evaluation of New York's system benefits programs (New York Energy \$martsm Program Evaluation and Status Report, May 2003) estimated that the cumulative energy savings for the program through 2002 are approximately 690 GWh and 690

MW. Once pending measures are installed, program savings are expected to reach 1,570 GWh and 1,120 MW.

The report concluded that New York's SBC programs are cost-effective with a Total Resource Cost benefit/cost ratio of 1.1. The cost per kWh saved was estimated to be approximately \$.044 and the cost per annual kW saved from peak reduction oriented programs was estimated to be approximately \$70. These costs reflect the total resource costs, including the customer contribution. The costs to NYSERDA alone would be \$0.011 per kWh and \$50 per kW. Costs per kWh saved includes only New York Energy \$martsm programs specifically targeted toward improving energy efficiency and transforming markets. Cost per kW reduction includes only New York Energy \$martsm programs specifically targeted toward procuring peak kW reductions, including both permanent and callable (demand reduction) initiatives.

Reasons for Exemplary Performance

New York offers a model of a jurisdiction that relies on an independent government authority to administer statewide programs. The reasons for its success include:

- NYSERDA, was an established organisation before being given a greatly expanded role for administering state-wide programs. It had sound infrastructure and processes in place, as well as a long record of managing energy projects and programs.
- NYSERDA built on its existing experience, as well as existing utility DSM programs, to create its state-wide programs. It quickly established a well-recognised “brand”—New York Energy \$mart to market its programs and create an identity that customers associate with energy efficiency.
- NYSERDA, with its roots in energy R&D, has been a leader in innovating new programs and services to serve customers more effectively and to serve markets previously un- or undeserved, such as multi-family housing and residential room air conditioners.
- NYSERDA's programs emphasise working with private business and industry in working towards common objectives and helping create markets that will develop and be sustained on their own that deliver energy-efficient products and services. It has had especially good results in fostering the growth of an independent “energy service company” (ESCO) market, which serves primarily large commercial and industrial customers. It also has targeted development of home energy services contractors that work with homeowners.
- NYSERDA offers a very comprehensive portfolio of programs that serve customers in all sectors—residential, commercial, industrial and agricultural. It also works to ensure that program services reach all geographic areas within the program service territory.
- Evaluation and tracking of results has been integral to NYSERDA's programs since their inception. Through evaluation and monitoring, program managers are able to get important feedback on program results and make adjustments accordingly. Also, the program tracks, records and reports aggregate impacts on a regular basis.
- NYSERDA has been very strategic in its planning and program development. Through careful market research, it has examined needs and opportunities carefully and strategically to develop program priorities and plans.

- While NYSERDA's programs themselves encompass a large, nearly regional market, NYSERDA also has recognised the synergies and benefits its programs gain from wider regional collaboration. Therefore, NYSERDA has been an active member and participant in the Northeast Energy Partnerships, a regional market transformation organisation.
- NYSERDA has benefited greatly from stability of funding and relatively long-term commitments for each of its two major funding cycles to date. The PSC has given NYSERDA time for the development and maturation of its programs and operations as a state-wide administrator.

CASE STUDY: VERMONT

Program Background and Structure

Vermont has a long history of providing customers energy efficiency programs and services. As in most states, these programs initially were offered by energy utilities as required by regulatory authorities—in Vermont, the Public Service Board. This utility model was in place in the 1980s and 1990s. However, in the late 1990s, Vermont investigated and considered restructuring of its electric utility industry. While it chose not to restructure and deregulate its industry, in 2000 the State of Vermont moved responsibility and administration of electrical efficiency programs from the 22 distribution utilities in the State to a new “energy efficiency utility.” This new entity, named “Efficiency Vermont” (EVT) and administered under contract by the Vermont Energy Investment Corporation, then began operating a comprehensive, state-wide energy efficiency program serving all types of customers—residential, commercial, agricultural and industrial.

Program Results

Efficiency Vermont’s annual budget is about \$16-17 million. EVT’s 2002 Annual Report states that Vermont customers invested \$16.8 million in energy efficiency measures in 2002 through its programs. The lifetime economic value of these energy efficiency improvements is estimated to be \$26 million. With a lifetime energy savings of 552,705,000 kWh, the cost of conserved energy is estimated to be approximately \$.03/kWh. This is compared the utilities’ average cost of \$.063/kWh. EVT estimates that its 2002 annual energy savings were 38.4 GWh.

Environmental improvement is another clear objective of this state-wide program. In 2002 Efficiency Vermont’s programs resulted in the elimination of 427,000 tons of greenhouse gas emissions.

Reasons for Exemplary Performance

Vermont’s model of a state-wide “energy efficiency utility” is a pioneering approach to energy efficiency programs. Reasons for its success include:

- As an organisation, it has a clear, unified mission—to reduce electricity costs and increase the capacity of the electric system through efficiency. A single state-wide entity is responsible for all efficiency programs and services, which assures consistency and co-ordination of efforts.
- Having a unified state-wide program improves marketing impact, increases program recognition, and simplifies customer participation. All customers in the state receive similar messages, have access to the full range of programs and services, and increasingly recognise “Efficiency Vermont” as a resource to assist them with reducing energy costs through efficiency.
- It has stable, multi-year support and funding that allows it to develop and implement an effective state-wide strategy for intervention and transformation of end-use energy and product markets.
- Efficiency Vermont has been granted a great deal of autonomy and flexibility in its operation. The Public Service Board establishes annual goals for

Efficiency Vermont, but largely takes a “hands-off” approach in following the day-to-day operations of Efficiency Vermont. The process is results-driven.

- EVT offers a comprehensive portfolio of programs, serving customers in all sectors—residential, commercial/institutional, industrial, and agricultural.
- EVT offers a diverse range of intervention strategies, including cash rebates and other financial incentives, customer information, technical training, marketing, and working with retailers, contractors and other trade allies.
- EVT strives to offer customers a relatively seamless array of services; it offers a single point of entry for customers to its programs and services via a phone call or other contact; EVT then determines how best to serve that customer.
- While Vermont is a relatively small state in terms of population and associated markets, EVT works to increase its impact through regional collaboration with organisations like the Northeast Energy Efficiency Partnerships (NEEP).
- EVT is careful to assure that participation and resulting program benefits are fairly distributed throughout all geographic areas of the state.
- Efficiency Vermont benefits from the high quality of program staff professionalism, delivery systems, equipment, marketing materials and on-going quality assurance processes.
- Efficiency Vermont built on a well-established, solid infrastructure of an experienced, well-known and respected organisation (Vermont Energy Investment Corporation--VEIC), which had been providing many of the same types of programs and services in Vermont through utility programs prior to the creation of the state-wide energy efficiency utility. VEIC is a non-profit organisation dedicated to the advancement of energy efficiency.

COMPLIMENATRY READING

The American Council for an Energy-Efficient Economy (ACEEE) is the leading institution in the United States in the area of monitoring and research of utility-sector energy efficiency policies and programs. ACEEE has conducted numerous national studies of state activity regarding utility and “public benefit fund” (or “systems benefit charge”) energy efficiency programs. Some of the ACEEE’s key reports in this area are listed below.

Kushler, Martin. 1998. *An Updated Status Report of Public Benefit Programs in an Evolving Electric Utility Industry*. Washington, D.C.: American Council for an Energy-Efficient Economy.

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