Energy Efficiency Resource Standards: State and Utility Strategies for Higher Energy Savings

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EXECUTIVE SUMMARY

Energy efficiency programs funded by and serving energy utility customers are now widespread. With roots in the energy crises of the 1970s, such programs have grown, endured, and evolved against a backdrop of many fundamental industry and broader economic changes. A majority of states have established specific policies that set specific energy savings targets for energy efficiency programs provided to customers by their utilities or related organizations. These policies, called "energy efficiency resource standards" (EERS), are driving programs to ramp up to achieve and sustain unprecedented levels of energy savings compared to historic achievements. Numerous studies of energy efficiency "potentials" over the years have portrayed a large, low-cost reserve of energy savings that could be captured through more widespread adoption of energy-efficient technologies, practices, and behaviors.

Many of these new state EERS policies have established energy savings requirements that are quite challenging. In some cases, well-established programs must double or even triple historical savings. In other cases, states with relatively little historical experience with large-scale energy efficiency programs have established similarly large energy savings goals over time (e.g., as much as 1.5% or 2% savings per year after a period of ramp-up). ACEEE conducted research on a selection of both types of states, six "Established Savers" and six "Rapid Starts," to review their progress towards meeting EERS goals and examine how the programs are responding to this challenge. We interviewed program managers, regulatory staff, consultants, and other energy efficiency experts for this research. We also reviewed selected program documentation and data.

Despite different starting points and backgrounds, states in each of those two categories are following a variety of common key strategies to achieve high savings. The distinction of being an "Established Saver" or "Rapid Start" seems mostly to affect practical implementation details and degree of emphasis on any of these strategies. Established Savers benefit from having their infrastructure in place and from having long experience with programs; however, they also have to reach beyond existing levels of achievements and into new territory. High numbers of customers in these states typically already have participated in programs. To achieve greater savings thus means reaching customers who have not participated before or moving previous participants to implement additional measures. Rapid Starts, by contrast, do not have the benefit of long-established programs, but on the other hand, are targeting customers who have not necessarily done much in the way of energy efficiency improvements. Thus, there is a large, untapped, low-cost reserve of energy efficiency opportunities to access through programs.

Key strategies that these states are utilizing in their efforts to achieve high savings include:

- *Increasing program funding.* Expanding, enhancing, and developing new programs require more resources. This is acknowledged as a fundamental requirement in order to achieve greatly enhanced savings impacts. Moreover, it is possible that reaching savings beyond historic levels may be more expensive per unit of saved energy as there are less of the easiest, lowest cost resources (the "low-hanging fruit") available.

- *Establishing supportive utility regulatory policies.* The financial disincentives for saving energy through improved energy efficiency become much more pronounced for utilities as the magnitude of such savings increases in response to higher EERSs. All leading states have instituted regulatory changes designed to align utility financial incentives with energy efficiency program objectives.

- *Establishing complementary policies to capture non-program savings.* While energy efficiency programs provided to utility customers (whether by utilities or related organizations) are the primary vehicles for reaching high savings, there are numerous related policies that can contribute to achieving overall state savings targets. These include building codes, appliance standards, state government procurement, and combined heat and power. Many state EERS

include provisions for such complementary activities to contribute to reaching prescribed savings goals.

- *Involving stakeholders in collaborative processes for program development and implementation.* Building relationships among key stakeholders, which include customers, manufacturers, contractors, trade associations, advocacy groups, regulators, and government authorities, is critical for effective program design and implementation. The products and services provided or supported through energy efficiency programs must appeal to customers and deliver real benefits.

Key strategies that utility program administrators are employing to fulfill resource standards include:

- *Identifying and prioritizing targeted technologies and end-uses.* The roles played by lighting and compact fluorescent lamps (CFLs) continue to be major considerations, as Established Savers shift resources toward new and more diverse lighting technologies while programs in Rapid Start states rely more heavily on CFL savings to meet the demands of increasing annual EERS levels.

- *Developing programs capable of delivering "deep" savings first, then seeking "broad" participation.* Increasing overall program savings in states that have had extensive efficiency portfolios for many years cannot be accomplished cost-effectively simply by expanding participation in existing programs. Program designs are being initiated that are capable of capturing more savings for each participating customer. This generally means customers must enact more measures, with greater incremental efficiency gains, to achieve "deep" savings.

- *Creating programs for new and emerging technologies.* Today's pace of technological change is rapid and accelerating. This affects customer markets and technological choices, as well as programs and services available to customer. Significant changes are occurring in such areas as lighting, HVAC, electronics, communications, and data systems. Many of these technological advances represent new energy savings opportunities that program administrators are seizing today and preparing to integrate into their portfolios within the timeframe of most of these state EERS requirements.

- *Extending portfolios with programs to reach new and under-served markets.* There are a number of customer markets that have not been as well served in the past as others have been, such as tenant fit-ups in commercial spaces, in which the premises are customized to match tenant needs and uses. New markets (such as computer data centers) and new approaches (such as behavioral programs) have recently emerged. Program administrators must examine such markets and approaches and ensure that programs are developed and available that can effectively serve these customers to deliver additional savings.

- *Taking on innovative advertising and promotional channels and increasing incentives to raise customer participation.* In Established Savers states, program administrators continue to enhance and extend programs to reach more participants. They are doing more advertising, finding ways to make participation easier and more convenient (especially through upstream and midstream lighting and appliance incentives), and offering higher rebates to more customers. In early program years, some new programs have overshot the mark and had to reduce rebates to conserve funds to meet consumer demand.

Leading industry experts and program managers agree that if the funding and political will are there, energy utilities will continue to develop, evolve, and extend efficiency programs to meet the standards.

Some early results presented here show that these twelve states are obtaining higher energy savings. Most utility respondents were optimistic that they would continue to meet annual standards in years to come.

OBJECTIVES AND SCOPE OF THE REPORT

A majority of states now have policies in place that establish specific energy savings targets for energy efficiency programs provided to customers by their utilities or related organizations. These policies—called "energy efficiency resource standards" (EERS)—are analogous to "renewable energy standards," which are also in place across a majority of the states. EERS have been enacted largely to accelerate and expand the scale of energy savings achieved through utility energy efficiency programs, primarily at large investor-owned utilities, but also at publicly-owned and cooperative utilities. The key break from the past is that these standards are set at savings levels that require more savings to be achieved through these programs than ever before—and not only having to reach these savings once, but also having to sustain and even increase these savings over time.

Numerous studies of energy efficiency "potentials" over many years have overwhelmingly portrayed a significant amount of savings that could be achieved through improvements in energy efficiency of our buildings and industries (McKinsey & Company 2009, National Academy of Sciences 2010). While such studies suggested a relatively large, untapped potential, actual amounts of annual energy savings achieved by utility and related programs historically have remained rather small—fractions of a percent of annual sales. Until recently, achieving annual savings of about 1% of annual energy sales was a rare achievement—and even today there are few states that have achieved this benchmark savings. Typically, long-standing, well-established programs may have achieved annual savings from about 0.5% to 0.7 percent of annual energy sales. This picture is changing rapidly, however, as an increasing number of states are pushing towards unprecedented savings levels—changes driven largely by EERS.

EERS have been enacted in states with long-standing, comprehensive programs and in states where such programs have been lacking. The starting points for achieving high savings levels are, therefore, much different in these two groups of states. States with long-running, full portfolios of programs can build upon strong infrastructures and experiences running customer energy efficiency programs. However, their past success can mean that they have already reached many customers and associated applications for implementation of energy-efficient technologies. This can mean these programs have to work harder to reach new customers as well as achieve "deeper" savings for each participating customer—that is, getting each customer to enact a larger set of energy efficiency measures than in the past. States that have not had customer energy efficiency programs in place lack the existing infrastructure and experience, but they also may be able to capture significant initial savings from essentially an untapped resource—energy efficiency measures that yield high savings relative to costs, and that are relatively easy to implement.

As a result of these differences in starting points, this study has a framework that features two categories of EERS states: "Rapid Start" (states with relatively little pre-existing energy efficiency programs and infrastructure) and "Established Saver" (states with well-established and relatively large-scale pre-existing energy efficiency programs and infrastructure).

This report examines the experiences of both kinds of states in responding to the challenges faced by their energy efficiency programs—whether provided by publicly-owned utilities, investor-owned utilities, or related "public benefits organizations"—in reaching the savings as established in EERS.[1] We interviewed program managers and other key stakeholders about how their programs are planning to reach high energy savings. We conducted most interviews with representatives from the largest investor-owned utilities with the largest efficiency portfolios. Input from these individuals does not necessarily represent efficiency program trends in rural electric cooperatives or municipal electric and gas utilities.

We also interviewed a set of national experts on program design, implementation, and evaluation for their perspectives on how customer energy efficiency programs as provided by utilities and related organizations are evolving and changing to meet new goals.

[1] ACEEE's concurrent publication, *Energy Efficiency Resource Standards: A Progress Report on State Experience* (Sciortino et al. 2011), systematically reviews the early results for every state with an EERS in effect for two or more years, or twenty of the twenty-six EERS states.

The objectives of this report are:

- Document the EERS policies being enacted to establish high energy savings goals and the utility and public benefits energy efficiency programs being undertaken to meet them;
- Examine the similarities and differences in such changes between programs in states with long-standing, well-established programs and in states that only recently initiated significant customer energy efficiency programs;
- Identify key program strategies and designs being pursued to reach high savings levels;
- Assess relative progress in meeting initial goals and present initial results;
- Identify and discuss key challenges being encountered and lessons learned;
- Examine trends and prospects for reaching and sustaining maximum savings levels prescribed in EERS; and
- Discuss complementary and supportive policies.

BACKGROUND

To understand this most recent energy efficiency policy mechanism (EERS), it is helpful to have some background and context regarding the history of utility energy efficiency efforts. Utility-sector energy efficiency policies have been characterized (Kushler et al. 2006) as having evolved through at least four major phases, as briefly described below.

- *The 1970s Energy Crisis Era:* The first utilities to offer programs to help customers reduce energy use began their efforts in the 1970s, after the initial 1973 oil embargo. These programs were primarily intended to help customers cope with soaring energy prices by providing them with programs to help lower their utility bills. These programs were found to be quite popular with customers, and spending on and savings of utility energy efficiency programs ramped up on into the 1980s.

- *The IRP Era:* In the mid- to late 1980s, the concept of utility integrated resource planning (IRP) emerged, which introduced the concept of demand-side management (DSM) and particularly accelerated the use of energy efficiency as an electric system resource. Electric utility energy efficiency spending grew steadily throughout this period, peaking at over $1.8 billion in 1994.

- *The Restructuring/Public Benefits Era:* Just as utility energy efficiency spending was accelerating, the electric industry "restructuring" movement was launched in 1994 and quickly spread across the nation. Unfortunately, for a variety of reasons, restructuring created economic pressures that tended to cause utilities to reduce or abandon energy efficiency programs. In addition, the move toward more limited regulation under restructuring tended to weaken or eliminate prior mechanisms that had helped facilitate energy efficiency, such as IRP. Nationwide, annual electric utility energy efficiency spending plunged by over 50% from 1994 to 1997 (York and Kushler 2005).

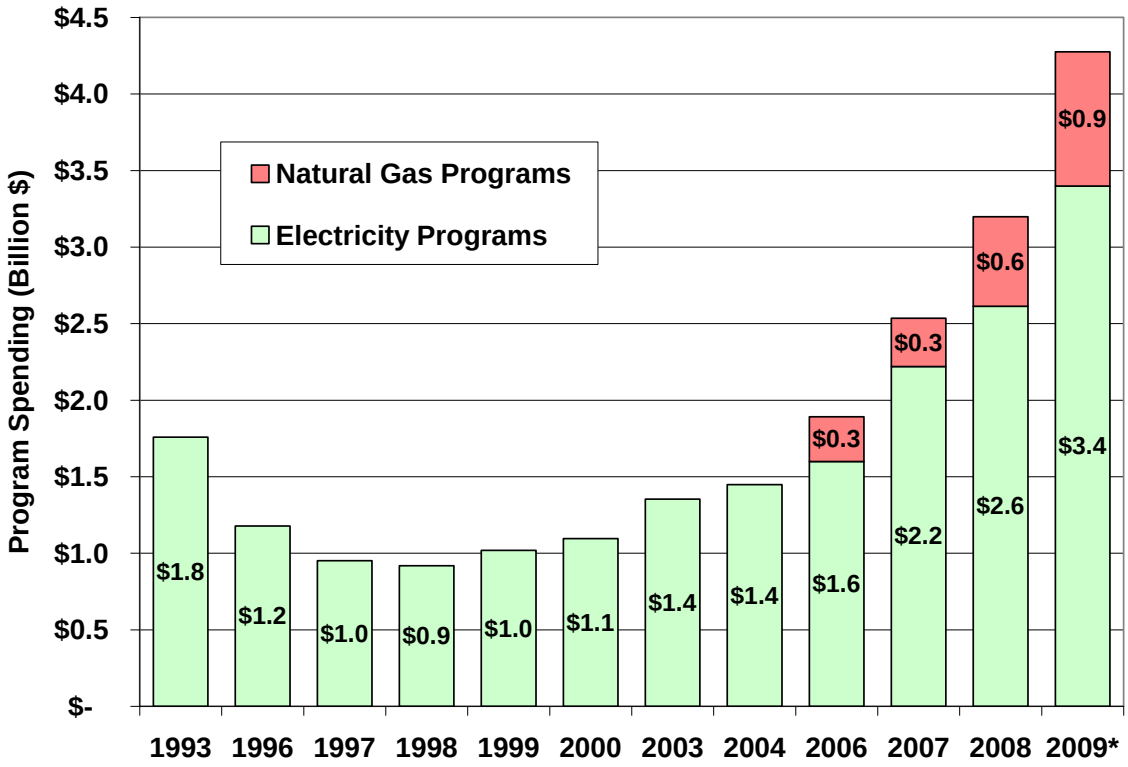
  In recognition of these adverse effects of restructuring on energy efficiency, many states included in their restructuring policy the creation of a "public benefits" funding mechanism, to continue some level of energy efficiency programming. The rationale for these programs was not to provide electric system resources (the "market" was to be responsible for that), but rather, to ensure that the beneficial effects of energy efficiency for the public (including environmental benefits) would not be lost. Arguably, the strategy of "public benefits" energy efficiency "saved" the concept of utility-sector energy efficiency and was able to begin to reverse the downward trend in utility energy efficiency spending, beginning in the post-1998 time period.

- *The Resource Procurement Era:* By the late 1990s, there were growing incidents of electric system reliability problems in several regions, culminating with the massive California/West Coast electricity crisis of 2001. These events tended to re-focus attention on the role of utility-sector

energy efficiency as a system resource, a notion that had fallen out of favor during the restructuring era.

As the first decade of the 21st Century unfolded, rapidly rising energy fuel costs and dramatic increases in power plant construction costs added urgency to the call for energy efficiency as a serious utility system resource. During that decade, funding for energy efficiency programs rose rapidly from the low point of the 1990s. Total funding for energy efficiency programs was $5.5 billion in 2010. Figure 1 traces the trends in energy efficiency program expenditures for the period 1993–2009.

Figure 1. U.S. Electricity and Natural Gas Energy Efficiency Program Spending or Budgets by Year, 1993–2009



* Includes ratepayer-funded programs. All values are actual program spending except for 2009, which are budgets. Natural gas efficiency program spending is not available for 1993–2004. Sources: Nadel et al. (2000); York and Kushler (2002, 2005); Eldridge et al. (2008, 2009)

This tremendous and rapid growth has been driven both by utility system resource needs and by the demonstrated low cost and value of energy efficiency as a means to reduce costs for customers and utilities, while providing benefits to the environment and public health, as well as meeting other public policy goals. The value of energy efficiency has been repeatedly demonstrated by regular, robust evaluations of these programs. The cost to utilities of saving electricity through utility energy efficiency programs has consistently been found to be in the range of about 2.5 to 3.0 cents per kilowatt-hour.[2] This is about one-fourth to one-third the cost of generating a kilowatt-hour by conventional fossil fuels in new power plants.

[2] For example, ACEEE reviewed the results reported by 14 states with major energy efficiency programs and found an average cost of conserved electricity of 2.5 cents per kWh (Friedrich et al. 2009).

Increasing concern for the environment also has played a role in this growth since reducing energy use through improved energy efficiency can greatly reduce emissions of airborne pollutants from power generated by fossil fuels, including greenhouse gases.

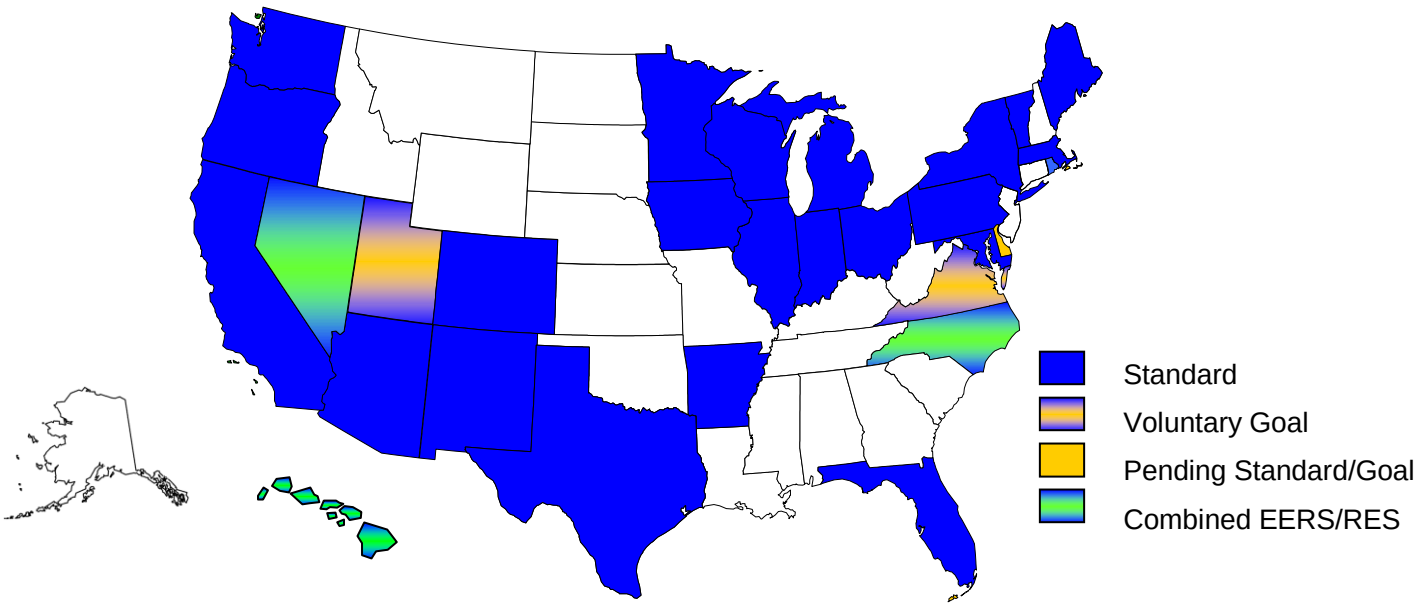
Energy Efficiency Resource Standards: Policies Driving Higher Savings

This new policy tool has arisen over the past decade in conjunction with the rebuilding and expansion of utility energy efficiency programs. An EERS establishes specific savings targets (expressed typically as a percentage of energy sales or specific energy units, such as therms of natural gas or kilowatt-hours of electricity) on a specific timetable. They are analogous to a "renewable energy standard," which are common among states across the U.S. In this manner, programs are driven by meeting established targets. Historically such goal-driven approaches have not necessarily been the norm for how programs have been developed and funded. In many cases program budgets have been a starting point; the amount of savings achieved then became more of a function of the initial budgets; cost-effectiveness screening of measures and programs; and finally implementation of the programs. Savings were an outcome, not necessarily the primary driver of program development and implementation.

Texas was the first state to establish an EERS, which happened in 1999 for energy efficiency programs offered by the electric utilities. Since then, 25 more states have put in place some type of EERS for electricity. Twelve states also include such standards for natural gas, and there are pending standards in a few other states.

The development of EERS is significant because these savings targets generally are set at levels that are pushing programs to achieve higher savings than they may have ever achieved prior to their enactment. Not only are EERS pushing the programs to achieve high savings, but they also seek to sustain such high savings levels over a span of many years. To meet and sustain these goals generally will require both adaptations to existing programs and development of new programs and innovative approaches to reach and serve more customers. Programs will have to achieve more savings per participating customer as well as reach customers who have not participated in past programs.

Figure 2. State Energy Efficiency Resource Standard (EERS) Activity
(As of January 2011)



See Appendix A for description of individual state EERS.

METHODOLOGY

We selected states from among the 26 states with energy efficiency resource standards in two groups. We chose one set from "Established Saver" states—those with strong, lengthy track records of energy efficiency programs in terms of their cumulative energy savings, total spending on ratepayer-funding utility energy efficiency programs (specifically excluding load management). We selected the other set from "Rapid Start" states—those with recent, rapid increases in spending and budgets, and without a long record of administering and delivering energy efficiency programs. Our selection of states within each group relied on our review of program data and expert judgment. We also strived to achieve geographic diversity to reflect different utility regulatory backgrounds and different energy resource characteristics.

Those interviewed were predominantly utility energy efficiency portfolio and program managers, along with some executives at government agencies and nonprofit organizations with extensive knowledge of utility energy efficiency in their states. We selected people who had perspectives on and experience with EERS policy as well as portfolio and program design approaches and implementation.

Interviews began with one open-ended question, "How will your utility or state reach the increased energy-savings goals?" followed by a series of open-ended prompting questions on specific topics. We supplemented interviews with document review of utility energy efficiency plan filings, impact evaluations, regulatory decisions and orders, and ACEEE and other published research reports.

Respondents were also asked what early results have been, and about their expectations concerning their utility and/or state meeting efficiency resource standards in the future.

STATES EXAMINED IN THIS STUDY

Established Savers

State EERS descriptions are listed in Table 1 chronologically from when the state adopted an EERS. Concerning the inclusion of Connecticut, please note that in 2008 the Connecticut Department of Public Utility Control (DPUC) ordered that the joint 2010 efficiency plan establish broader, longer-term goals,[3] however, Connecticut utilities did not include long-term goals in their joint 2010 or 2011 Plans. Goals for programs do exceed 1% annual savings in 2010 and 2011.

[3] See http://www.aceee.org/sector/state-policy/connecticut - _ftn1#_ftn1

Table 1. Summaries of Established Savers State EERS Policies

State Year Enacted Electric/Natural Gas Policy Type	Energy Efficiency Resource Standard	Reference
Massachusetts[4] **2009** **Electric and Natural Gas EERS**	Electric: 1.4% in 2010, 2.0% in 2011; 2.4% in 2012 Natural Gas: 0.63% in 2010, 0.83% in 2011; 1.15% in 2012	Electric: D.P.U. Order 09-116 through 09-120) Natural Gas: D.P.U. Order 09-121 through 09-128
Vermont 2000 Electric Tailored Utility Targets (Efficiency Vermont)	~6.75% cumulative savings from 2009 to 2011	30 V.S.A. § 209; VT PSB Docket 5980; PSB Contract[5]
New York 2008 Electric and Natural Gas EERS	Electric: 15% Cumulative savings by 2015 Natural Gas: ~14.7% Cumulative savings by 2020	Electric: NY PSC Order, Case 07-M-0548 Natural Gas: NY PSC Order, Case 07-M-0748
Minnesota 2007 Electric and Natural Gas EERS	Electric: 1.5% annual savings beginning in 2010 Natural Gas: 0.75% annual savings from 2010-2012; 1.5% annual savings in 2013	Minn. Stat. § 216B.241
Connecticut[6] **2005** **Electric**	~1% annual savings 2008-2011	Public Act 07-242 of 2007
California[7] **2004 and 2009** **Electric and Natural Gas EERS**	Electric: ~1% annual savings through 2020 Natural Gas: 150 gross MMTh by 2012	CPUC Decision 04-09-060; CPUC Decision 08-07-047; CPUC Decision 09-09-047

Rapid Starts

State EERS summaries for Rapid Start states are listed below in Table 2.

[4] The underlying statute, Mass. General Laws c. 25 § 21, requires gas and electric efficiency program administrators to procure "all energy efficiency and demand reduction resources that are cost effective or less expensive than supply."
[5] Goals for 2009 and 2010 were combined. Efficiency Vermont also set goals in previous years in three-year intervals.
[6] Connecticut does not currently have long-term energy efficiency savings goals that can be defined as an EERS. It is included in this report because it has very recent experience with an EERS policy.
[7] California's goals presented as gross savings. A rough estimate of California's goal as net savings can be achieved by converting gross savings to net savings using the 2009 net to gross conversion factor of 61% (CPUC 2011). Net goals are approximately 0.8% annual savings for the period 2010-2013, dropping to 0.55% from 2014-2020. California's evaluation and attribution methods are some of the strictest in the country, however, which partly explains the low net to gross conversion factor.

Table 2. Summaries of Rapid Start State EERS Policies

State Year Enacted Electric/Natural Gas Policy Type	Energy Efficiency Resource Standard	Reference
Arizona 2009 Electric EERS	2% annual savings beginning in 2014., 22% cumulative savings by 2020	Docket Nos. RE-00000C-09-0427, Decision No. 71436
Illinois 2007 Electric and Natural Gas EERS	Electric: 0.2% annual savings in 2008, ramping up to 1% in 2012, 2% in 2015 and thereafter Natural Gas: 8.5% cumulative savings by 2020 (0.2% annual savings in 2011, ramping up to 1.5% in 2019)	S.B. 1918 Public Act 96-0033 § 220 ILCS 5/8-103
Ohio 2008 Electric EERS	22% by 2025 (0.3% annual savings in 2009, ramping up to 1% in 2014 and 2% in 2019)	ORC 4928.66 et seq. S.B. 221
Colorado 2007 Electric and Natural Gas Tailored Utility Targets	Electric: PSCo and Black Hills Energy (BHE) both aim for 0.9% of sales in 2011 and increase to 1.35% (1.0% for BHE) of sales in 2015 and then 1.66% (1.2%) of sales in 2019 Natural Gas: Savings targets commensurate with spending targets (at least 0.5% of prior year's revenue)	Colorado Revised Statutes 40-3.2-101, et seq. ; COPUC Docket No. 08A-518E; Docket 10A-554EG
Michigan 2008 Electric and Natural Gas EERS	Electric: 0.3% annual savings in 2009, ramping up to 1% in 2012 and thereafter Natural Gas: 0.10% annual savings in 2009, ramping up to 0.75% in 2012 and thereafter	M.G.L. ch. 25, § 21; Act 295 of 2008

STRATEGIES FOR INCREASED SAVINGS: ESTABLISHED SAVER STATES

The primary source of information for this section consisted of thirty-two semi-structured interviews with key individuals across the six states, together with review of associated documents from each state. We present the results of the analysis of this information below.

Increased Funding

While states and program administrators employ a variety of strategies to achieve EERS goals, a fundamental prerequisite to obtaining savings on the new order of magnitude is increased investment. All six states in this study with well-established efficiency program administration structures have increased efficiency budgets since the adoption of their EERS policies. The total budget for 2009 electric efficiency programs across these six states was more than double the total annual spending in 2006. For natural gas, the total efficiency budget had more than tripled, as shown in Table 3. During this period, Massachusetts, New York, and Minnesota adopted EERS for the first time. The other states expanded and enhanced their standards. Connecticut passed 'An Act Concerning Electricity and Energy Efficiency.' The California Public Utilities Commission (CPUC) issued a decision setting statewide ten-year goals for

the investor-owned utilities. The Vermont legislature voted to pass Act 61 of 2005 to remove the efficiency spending cap, allowing the Public Service Board flexibility to determine appropriate funding levels in the context of minimizing energy costs.

Table 3: Established Savers States Annual Energy Efficiency Expenditures and Budgets 2006-2009

	Electric Spending ($Million)			Budget ($Million)
	2006	**2007**	**2008**	**2009**
California	$357	$755	$1,000	$998
Connecticut	$70	$96	$104	$73[8]
Massachusetts	$125	$120	$125	$184
Minnesota	$48	$91	$138	$111
New York	$225	$242	$236	$378
Vermont	$16	$24	$31	$31
Total	**$840**	**$1,328**	**$1,634**	**$1,776**

	Natural Gas Spending ($Million)			Budget ($Million)
	2006	**2007**	**2008**	**2009**
California	$94.1	$118.1	$220.0	$378.4
Connecticut	$1.4	$2.6	$7.5	$9.4
Massachusetts	$25.6	$25.6	$30.1	$38.0
Minnesota	$15.2	$15.6	$16.2	$22.3
New York	$21.9	$10.6	$50.1	$42.9
Vermont	$1.5	$1.5	$1.9	$1.8
Total	**$159.7**	**$174.0**	**$325.8**	**$492.8**

Source: Molina et al. 2010; Eldridge et al. 2009

Regulatory Policies

Because the regulatory business model throughout the United States is set up on the fundamental principle of shareholder value maximization, almost every investor-owned utility has an incentive to increase retail sales and a disincentive to make a whole-hearted commitment to energy efficiency.

To remove the disincentive, which may be a major barrier to hitting energy-savings targets for the utility, many states have adopted policies decoupling sales volume from revenues. All six of the established saver states reviewed for this report have decoupling authorized for both natural gas and electric utilities. The term "decoupling" refers to the effort to sever the link between utility sales and revenues. In practice, this means that the regulatory body periodically "trues up" any difference between a utility's actual sales for a particular year and sales projections submitted by the utility as part of its revenue requirement.

To create positive motivation for utility management to work more aggressively for deeper energy savings over the long term, states create shareholder incentives that reward utilities for successful implementation of energy efficiency programs. All six of the established saver states reviewed for this report have shareholder incentives authorized for both gas and electric utilities.

California has extensive and well-established state laws and regulations that recognize, prioritize, and promote the value of utility energy efficiency. There is a culture that reinforces the particular policies. These deserve special note even among the top performing states because of the sheer scope, scale, and duration of energy savings achieved. By 2007, California electric utilities had reported cumulative annual energy savings of over 21,000 GWh, more than 30 percent of the total for all 50 states. Two

[8] Decline is due to reallocation of funds for state budget

specific policies that demonstrate the high level of support for sustaining energy savings into the future are:

1.) Loading Order
It is state policy that all cost-effective energy efficiency shall be put in place before making commitment to supply side resources, whether renewable energy or base load power plants. The California Public Utilities Commission takes a strong hand in the resource analysis.

2.) Incentive
The last cycle of the Risk/Reward Incentive Mechanism (RRIM) made up to $450 million potentially available to utilities. The CPUC defined a recent RRIM for investor-owned utilities in the Energy Efficiency Proceeding (CPUC Rulemaking 06-04-010). Decision 07-9-043 (October 2007) establishes a minimum performance standard for the utilities under which incentive earnings accrue only if the IOU energy efficiency portfolio of programs achieves at least 85% of the CPUC's goals. While this incentive mechanism is no longer in effect, a new mechanism is being negotiated.

Non-Utility Energy Savings

Increased funding for utility programs makes the expansion and reinvention of utility efficiency portfolios possible—and therefore, makes reaching stepped-up energy savings requirements placed on the utilities attainable—but not all EERSs rely solely on utility demand-side efficiency programs. In some states, savings from other policies and programs are allowed to contribute toward the total EERS savings goals.

These complementary policies can be significant sources of energy savings that count toward efficiency resource standards Building codes and appliance standards are one large extra-utility wedge of savings that policy makers in a couple of states have added in to meet multi-year and longer term resource needs. For example, the California utilities are eligible to receive credit toward their energy savings goals for their role in advancing state codes and standards. The California Public Utilities Commission has adopted a methodology to assign savings to the utilities for adopted codes and standards called Codes and Standards Enhancements (CASE) (CEC 2009). The Massachusetts utilities are in the process of developing a comprehensive building energy codes support strategy and implementation plan, for which they hope to receive savings credits from the regulators.

In New York, the State Energy Planning Board has projected that almost one-third of the electricity savings in the state's '15 by 15' goal (15 percent reduction in electricity use by the year 2015) will be attributable to codes and standards. Approximately another third will be saved by state agencies other than the New York State Energy Research and Development Authority (NYSERDA), NYSERDA's previously-approved SBC III programs, and through efficiency improvements to transmission and distribution systems. NYSERDA, the investor-owned utilities, cooperatives, and municipal utilities together make up the remainder.

Minnesota has also constructed their efficiency standard to include a substantial share of savings from sources other than utility demand-side efficiency programs. Of the 1.5% annual electric savings, the Next Generation Energy Act only requires that the first 1% must be met with direct utility program energy efficiency savings. Up to 0.5% may be met by efficiency enhancements to a utility's generation, transmission, and distribution infrastructure, and from other non-traditional energy saving sources, such as efficiency enhancements to their own facilities (on the demand side).

Vermont and Connecticut rely on ratepayer funded utility energy efficiency program savings to fulfill their EERSs.

Collaboratives and Stakeholder Processes

In addition to EERS-supporting policies, many states have set up multi-stakeholder groups and processes to enhance collaboration and coordination, share program ideas and expertise, and smooth the path to achieving state EERS policy goals.

Examples are:

- "1.5% Energy Efficiency Solutions Project" in Minnesota, which was created when the Minnesota Division of Energy Resources (DER) contracted with the Minnesota Environmental Initiative (MEI) to lead a multi-stakeholder process to find ways to achieve the 1.5% goal, focusing on four "policy barrier issue areas": behavioral programs, low income, codes and standards, and utility infrastructure improvements. The Project convened technical working groups on the main issues areas to develop proposed solutions.
- Connecticut has a standing Energy Conservation Management Board (ECMB) established, the members of which are appointed by the Department of Public Utility Control (DPUC), that oversees the utilities' efficiency planning and plays a coordinating role.
- Massachusetts' analogous group is the Massachusetts Energy Efficiency Advisory Council (MEEAC), an 11 member stakeholder body chaired by the state Department of Energy Resources (DOER). MEEAC works collaboratively with the utilities to develop coordinated energy efficiency plans.
- New York has several large program administrators to coordinate, including three large state agencies, National Grid, and Con Edison, as well as smaller utilities. A New York Power Authority (NYPA) representative described their overall model toward financing efficiency as a partnership with a very collaborative style, in which they meet frequently with the NYSERDA and the utilities in a "constant effort to reduce market confusion and coordinate [funding sources] [Energy Efficiency Portfolio Standard] EEPS, [Regional Greenhouse Gas Initiative] RGGI, and [American Reinvestment and Recovery Act] ARRA." Additionally, in December 2010, the Public Service Commission established an Implementation Advisory Group (IAG) consisting of Department of Public Service staff and representatives of all the EEPS program administrators. The IAG meets regularly to advise on implementation issues and assist in program coordination among PAs.

Technologies and End Uses

Lighting was the end use category most often cited by respondents as expected to have the greatest impact on achieving future savings goals. CFLs were the technology most often cited.

Efficiency Vermont's Efficient Products Program, with a large share from lighting, made up a quarter of the total energy savings in their portfolio. With high CFL saturation, they are moving toward dimmable, 3-way and specialty CFLs and LED's. From 2009 to 2010, resources were shifted to increase specialty bulbs from 10 to 20 percent of budget.

An approach garnering substantial energy savings in Vermont is the use of lighting designers to decrease lighting density in the commercial sector. Efficiency Vermont has built strong relationships with lighting designers, who can help customers save money that in turn helps to pay for their lighting design audits. Similar dynamics are at work in New York and Connecticut. Electric utilities see the rolling improvement of efficient lighting technologies as creating substantial energy savings opportunities. One utility called the opportunities "almost endless". With the evolution of program management and delivery, Connecticut's United Illuminating could meet their savings goals with lighting alone.

Starting in 2012, the Energy Independence and Security Act (EISA) will begin raising the minimum energy efficiency allowed for light bulbs. As these federal lighting standards go into effect, it will reduce the marginal savings attributable to CFL program. Therefore, as specialty CFLs make up a greater share of savings, and as lighting markets are increasingly transformed—leading to lower attributed savings for the

utility—the search is on for the "next CFL" as a large, cost-effective efficiency opportunity. No one interviewed for this report held the position that the void would be filled by one single technology in isolation; instead, an array of partial solutions are likely to be employed.

One view expressed was that standards related to T-12s and T-8s and ballasts are likely to have a far greater marginal efficiency and program impact than CFLs; however, T-8 and T-12 standards were mentioned less often than CFLs were by those we interviewed for this report.

"Deeper, Then Broader"

Instead of substituting another end use for lighting or a different technology to take the place of CFLs, program administrators are redesigning programs to reduce administrative costs per unit of energy saved and reduce lost efficiency opportunities by capturing savings beyond the "low hanging fruit." ("Lost efficiency opportunities" here means potential energy savings not acquired, which in the future will be cost prohibitive when standing on their own.) The approach pervasive in Massachusetts begins with getting "deep" savings per project, achieving high percentage reductions in energy use by acquiring all efficiency that is cost effective when measured as a package. Then as program participation is expanded, total savings multiply. The alternative—of concentrating on the most cost-effective measures only for each customer in the early years—leaves nothing but the most costly measures for the future when EERS savings requirements will be even higher.

The "deeper, then broader" idea is implicit in the way efficiency is done in Vermont, where it allows Efficiency Vermont to allocate funds where they can buy the most long-term energy savings with each dollar. Relative to other program administrators, they do more custom projects, and they are not limited to working with prescriptive measures and prescriptive projects. This allows incentives to be entirely negotiated with the customer, effectively buying down the cost of the project or measure until it becomes an attractive investment for them.

In New York, NYSERDA's commercial and industrial programs mainly aim toward systems approaches and performance-based programs, rather than device- or rebate-focused approaches.

In Connecticut, bundling lighting measures with less cost-effective measures to get deeper savings per project is a program strategy that the utilities are using in all sectors. For residential, they are using a whole house, fuel-blind approach, featuring instrument-guided weatherization, with gas and electric utilities collaborating under the Home Energy Solutions brand.

In the California 2010-2012 program cycle, for the residential sector, the investor-owned utilities (IOUs) are emphasizing whole house retrofits aimed at reducing the annual energy consumption by 20% through comprehensive retrofits. The IOUs focus on getting the largest savings possible in each particular market. In order to do this, they learn as much as possible about each one through market studies, their account representatives and field engineers. The idea is to create an energy package that works for the customer—using more of the customer's language and less energy efficiency jargon.

Programs for New Technologies/New Customer Market Segments

Another dimension of growth to occur on top of "deeper" and "broader" might be called "wider," or more inclusive and comprehensive. Extending their portfolios, whether by developing new programs to run in addition to existing programs, or by providing rebates and other incentives for added efficiency technologies within existing programs, is a way to gain incremental savings which several established saver states are employing to meet sustained high annual savings goals. Adding new programs to fill niches where there are underserved markets, such as restaurants, or adding new technologies such as LED lighting, open up streams of future savings.

Examples abound of program administrators segmenting markets to target programs to previously underserved customer groups and adding new technologies. In New York, NYSERDA and National Grid

have developed a collaborative program for hospitals and the health care sector; Con Edison is similarly working with NYSERDA, NYPA, and the Electric Power Research Institute (EPRI) on a data center partnership. In Connecticut, heat pump water heaters will be offered through the Home Energy Solutions program and commercial and industrial programs will add new incentives for induction lighting and LED lighting. Massachusetts is adding ENERGY STAR televisions. Xcel Energy in Minnesota created the Data Center Efficiency Program, and CenterPoint Energy has segmented their natural gas commercial sector to hone in on five more narrowly defined industries with the best savings opportunities.

Behavioral and customer behavior-based programs are growth areas for the future, according to respondents from California, Minnesota, and Massachusetts. All three are at least running pilot behavioral programs. However, none are relying on behavioral programs for substantial savings to meet EERS targets in their plans for the next few years.

Promoting Participation: Upstream Rebates, More Rebates and Enhanced Advertising

Program administrators continue to enhance and extend traditional program approaches to motivate more utility customers to save more energy through their efficiency programs. They are doing more advertising, finding ways to make participation easier and more convenient, and offer higher rebates to more customers.

"Upstream" and "midstream" rebates have been increasingly replacing point-of-purchase rebates at retail for efficient products such as CFLs and appliances. Instead of point-of-purchase rebates for the customers, these rebates are to the manufacturers, retailers, and distributors. This enables them to lower prices and enhance merchandising and promotion. Connecticut's electric utilities have made this change and now do upstream promotions for appliances and lighting. CFLs are discounted at the wholesale level in Massachusetts. In Vermont, buying down the price of CFLs has been combined with an effort to work with retailers statewide, so that CFLs are widely available for only $0.99, even at conveniences stores.

The Long Island Power Authority (LIPA), a publicly-owned electric distribution utility, has been expanding their efficiency portfolio at a scale, budget, and pace that makes it comparable on those fronts to an entire Rapid Start state. To ramp up participation, LIPA has shifted their marketing and communications approaches to include video testimonials, more visuals, and YouTube. In the past, customers were notified of available rebates via mailings, tradeshows, bill stuffers, and local papers. Now advertising and marketing are focused on the decision makers—if the customer is a school, for example, the buildings and grounds manager are targeted. Efforts are underway to improve marketing coordination with the trades, because the tradesmen need to both know the efficiency programs and be able to sell them. For example, a local electrician needs to be aware of which rebates are available and how much. NYPA also reports doing marketing that is more aggressive.

As discussed in the section on funding, more and/or higher rebates are available in all twelve states researched for this report. Increased funding for rebates and other customer financial incentives is highly correlated over time with the states' adoption of EERS policies. Minnesota's largest investor-owned gas and electric utilities are planning for higher rebates per measure and more funding for rebates overall as one of their primary strategies. At the other end of the spectrum, Vermont has included only moderate increases in overall funding for customer financial incentives within their current triennial planning cycle. Efficiency Vermont emphasizes long-term planning, relationship building, program implementation flexibility and innovation as means to increase participation instead of increasing rebates. Massachusetts rebate levels are in the middle range among comparable states. Since there is no spending cap, Massachusetts is planning overall funding increases in the hundreds of millions per year as energy savings targets increase steeply over 2011 and 2012. This way, it is less likely that rebate funds will run out with unexpectedly high participation.

Customer Education and Contractor Training

Respondents seldom mentioned either broad customer education programs or contractor training among their primary strategies for increasing and sustaining high levels of energy savings to comply with EERS requirements. Energy savings impacts from education and training are hard to measure, and many states do not give utilities significant credit toward EERS compliance for the energy savings that result from them. The states with the largest efficiency programs have extensive customer education and workforce development and training investment, staffing, and infrastructure, which together play a major supporting role in the long-term efforts to save significant amounts of energy as a system resource. Among the states studied in this report, California and New York invested the most in education and training and acquired the most savings for their EERSs. These states also spent the most on evaluation, measurement, and verification. In California, two of the twelve statewide programs approved as part of the California utilities' 2010-2012 energy efficiency program portfolio that incorporate concepts from the California Long Term Energy Efficiency Strategic Plan are Workforce Education and Training (WET) and Marketing Education and Outreach (ME&O).

Representatives from utilities in other states noted education and training as one component of broader strategic initiatives. For example, in Minnesota, Xcel Energy added a School Education Kits program as one of several new programs added to their portfolio in their 2010-2012 plan filing.

Connecticut's Department of Public Utility Control approved the 2010 joint Conservation and Load Management plan for the state's electric and natural gas utilities, ordering a number of program changes in response, including increased training on code revisions, which the utilities had not originally included in their joint plan proposal.

Market Transformation

When we asked what role market transformation efforts would play in EERS compliance, responses varied. Interpretations of the meaning of the phrase "market transformation," and how it relates to EERS compliance, also varied. Implementation of energy efficiency plans designed to achieve state policy savings goals have long-term market impacts and may lead to transformed markets. The inverse—implementation of market transformation-oriented programs to comply with EERS—was not described as a primary prospective strategy.

The states with the most extensive and long-running efficiency programs place the most emphasis on market transformation. The California Long-Term Energy Efficiency Strategic Plan adopted by the California Public Utilities Commission in 2008 included four Big Bold Energy Efficiency Strategies. Of these, three have transformed markets as their goal: 1) all new residential construction will be zero net energy by 2020, 2) all new commercial construction in California will be zero net energy by 2030, and 3) the Heating Ventilation and Air Conditioning (HVAC) industry and market will be transformed to ensure that its energy performance is optimal for California's climate.

One of the most significant institutional responses to EERSs has been in New York. As the largest program administrator in the state, NYSERDA is re-aligning the administrative structure of their energy efficiency programs and portfolios. They are integrating programs funded and created in response to the EERS order with those existing programs that included Resource Acquisition. NYSERDA has received approval from NYPSC to reorganize Energy Efficiency Portfolio Standard (EEPS) and System Benefits Charge[9] (SBC) III funding and portfolio composition. Effective July 1, 2011, Resource Acquisition programs in the SBC portfolio, and their budgeted funds, will extend for six months and move over to merge into their EEPS counterparts. A second portfolio, Technology and Market Development, will continue to stay within the SBC portfolio, funded with SBC funds. While some energy savings from both areas will contribute to the statewide '15 by 15' goal, this realignment demonstrates the importance of the distinction.

[9] Please note that New York has the SBC *program* and the SBC *collection mechanism*, which includes collections for the SBC, EEPS, and RPS programs.

In Connecticut, as in most states, the utilities currently do not get any credit toward their EERS goals for energy savings achieved through appliance standards, so developing new appliance standards does not help them hit their targets. CL&P does get some savings attribution from a new pilot program, the Business Sustainability Challenge. CL&P holds classes and brings in companies to train them about sustainability and energy efficiency.

In Minnesota, Xcel Energy describes their future efficiency program success as dependent on many factors, the development of methodologies to quantify savings from nontraditional programs and market transformation among them.

Residential and Commercial/Industrial Sector Funding Allocation

While some utilities have changed the allocation of budget funds among residential, commercial and industrial sectors, there are no significant trends across multiple states.

Two states that are expanding established programs have been shifting budget funds among sectors. Efficiency Vermont's Annual Plan for 2011 shows that the planned share of funds budgeted for business efficiency programs will increase from of 66% of spending in 2009 to 70% in 2011. In Connecticut, the allocation of budget dollars from 2007 to 2010 could be roughly described as half of the money goes to Commercial and Industrial sector programs, one third to Residential, and the rest to Administration, Planning and Education. There has been an increase in the Residential share from 34% to 39%.

For the Massachusetts 2010-12 electric joint energy efficiency plan, the allocation of funding among sectors remained constant within a 1% range from year to year: 72% for commercial and industrial, 24% for residential, and 4% for low-income. For New York, none of the respondents volunteered that shifts in sector budget allocations were going to be a major strategy to meet statewide savings goals; however, New York is still testing the market response to these relatively new programs. LIPA stated that most of the growth in savings at Efficiency Long Island was expected to come from business sector programs. Similarly, in Minnesota, Xcel Energy's 2010 Minnesota electric efficiency budget had $28 million for commercial and industrial programs and $8 million for residential, and will continue the emphasis on business as 70% of their retail sales are to business customers.

One exception where there was a larger reallocation of budget dollars was CenterPoint Energy's proposed Minnesota natural gas efficiency budget for 2010-2012, which allocated an increased share of funds to residential sector programs—despite the savings being three times more expensive per unit of energy saved. The industrial natural gas efficiency sector in CenterPoint's service territory is increasingly saturated, and the number of marginally cost-effective efficiency opportunities is declining. The plan increased the budget for residential programs over 35% and the projected energy savings more than 50%.

STRATEGIES FOR INCREASED SAVINGS: RAPID START STATES

Increased Funding

Rapid Start states have expenses that Established Saver states do not. They have to build their program portfolio from the ground up. Hiring, training, and organizing employees and contractors in addition to marketing and advertising to raise awareness, and many other costs, must be incurred before energy savings are realized. Both sets of states multiplied their electric and natural gas efficiency budgets. Table 4 below shows Rapid Start states' budget increases.

Table 4: Rapid Start States Annual Energy Efficiency Expenditures and Budgets, 2006-2010

State (Year EERS Adopted)	Electric Spending ($Million)			Budget ($Million)	
	2006	2007	2008	2009	2010
Arizona (2009)	$16.4	$31.9	$44.6	$49.2	$87.0
Colorado (2007)	$11.0	$15.3	$17.0	$46.7	$64.7
Michigan (2008)	$10.0	$0.0	$1.6	$50.1	$78.0
Ohio (2008)	$28.8	$28.8	$9.7	$18.6	$152.8
Pennsylvania (2008)	$3.8	$4.1	$2.1	$96.9	$110.0
Illinois (2007)	$3.2	$0.8	$8.8	$89.9	$107.4
Total	**$73**	**$81**	**$84**	**$351**	**$600**

State (Year EERS Adopted)	Natural Gas Spending ($Million)			Budget ($Million)	
	2006	2007	2008	2009	2010
Arizona (2009)	$0	$0	$0.9	$4.0	NA*
Colorado (2007)	$2.5	$2.6	$2.4	$13.3	NA
Illinois (2007)	$0	$0	$0.8	$4.1	NA
Michigan (2008)	$0	$0	$12.4	$30.8	NA
Ohio (2008)	$0.5	$2.9	$12.2	$25.5	NA
Pennsylvania (2009)	$0	$0	$5.1	$8.7	NA
Total	**$3**	**$6**	**$34**	**$86**	NA

Sources: Molina et al. 2010; Eldridge et al. 2009; CEE 2009; CEE 2010
*NA = Not Available.

Regulatory Policies

The Rapid Start states had very little in the way of utility energy efficiency programs prior to establishing resource standards, and did not have significant support through policy or utility or government leadership for efficiency programs to become a major energy resource. While all six Big Saver states have some form of revenue decoupling and shareholder or other utility performance incentive, the Rapid Start states are mixed, as shown in Table 5 below.

Table 5: Rapid Start States Decoupling and Incentive Policy Status

State	Electric EERS	Electric Decoupling	Electric Incentive	Gas EERS	Gas Decoupling	Gas Incentive
Arizona	Yes	No	Yes	Yes	NA	No
Colorado	Yes	No	Yes	Yes	Partial/Pilots	Yes
Illinois	Yes	No	No	Yes	Yes	No
Michigan	Yes	Yes	Yes	Yes	Yes	Yes
Ohio	Yes	Yes	Yes	No	No	NA
Pennsylvania	Yes	No	No	No	No	No

Non-Utility Energy Savings

In marked contrast with the policies of several of the largest and most sophisticated states, Rapid Start state EERS policies are structured to acquire almost all the energy savings by administration of ratepayer-funded demand side energy efficiency programs.

In Ohio, the utilities are responsible to meet their proportional shares of the overall statewide retail sales. However, they may include savings from their large industrial ("mercantile") customers in their plans to comply. Michigan's utilities, including municipal and cooperative operators, are the sole contributors to the savings goals. In Illinois, utilities are accountable for 75% of energy savings mandated by the EERS, and the Department of Commerce and Economic Opportunity (IDCEO), which runs programs for government and low- income customers, is accountable for 25%. Colorado has a general statewide multi-year goal, but it does not strictly meet the definition of an energy efficiency resource standard. The Colorado Public Utilities Commission is, however, required to set goals for the utilities.

Collaboratives and Stakeholder Groups

Many of the Rapid Start states established collaboratives to help plan, coordinate, design, and prepare for energy efficiency programs prior to EERSs going into effect. Common early activities involved the evaluation of energy efficiency potentials and research on best practices of successful programs.

The Illinois Energy Efficiency Stakeholder Advisory Group (ILSAG) was established by the Illinois Commerce Commission to review progress toward achieving the electric energy efficiency goals and to strengthen the large-utility efficiency program portfolios (ComEd, Ameren Illinois) and IDCEO's portfolio. Several major environmental and consumer groups meet along with state and utility representatives.

Michigan has a comparable group. In June 2009, under Orders from the Michigan Public Service Commission (MPSC), in cases U-15805 and U-15806, the MPSC staff started a statewide Energy Optimization Collaborative with the mandatory participation of all gas and electric providers. The purpose of the Collaborative is to review and improve Energy Optimization plans to maximize their effectiveness. A variety of other stakeholders were invited to join, and the order stated that energy efficiency experts, equipment installers, and other interested stakeholders should be encouraged to participate.

The structure is different in Ohio, where the Public Utilities Commission of Ohio (PUCO) rules encourage the formation of stakeholder collaboratives, but do not require their formation. Each of the large utilities has an active stakeholder collaborative.

Utility Program Strategies

Technologies and End Uses

Throughout the Rapid Start states, utilities have consistently pursued the most cost-effective and tried-and-true end uses and technologies. Almost without exception, these are lighting and CFLs. For residential programs, CFLs are the dominant technology. For commercial and industrial programs, there are more lighting technologies, each comprising a significant share of savings, yet CFLs continue to be important.

In 2009-2010, the Michigan utilities targeted the "low-hanging fruit," with lighting programs getting the most emphasis. With the aggressive savings increases planned over the next three to four years in Colorado, Xcel Energy's operating subsidiary Public Service Company of Colorado (PSCo) will build on their strong commercial and industrial programs, expanding CFL and commercial lighting.

Illinois' largest electric utility, ComEd, continues to focus heavily on lighting-oriented programs to achieve energy savings and sees lighting efficiency opportunities persisting in the business sector, such as in warehouses and light manufacturing. Both ComEd and Ameren Illinois describe their choice of lighting

and CFLs to be at the core of their portfolios as a result of being risk-averse, with the risk-aversion resulting from the regulatory and policy constraints that they confront, such as net-to-gross attribution of savings and measure-level cost-effectiveness tests. While both have been preparing for and developing non-lighting efforts since the first program year, participant interest in lighting continues to predominate.

Duke Energy Ohio will continue to look to lighting for the next several years. As LED lighting is not yet cost effective under Ohio's cost-effectiveness tests, in 2012 Duke may use an early replacement CFL program—to get residential customers to install the bulbs that they have already bought—in order to be able to count the savings toward their EEPS targets. At Dayton Power and Light (DP&L), during the initial phase of the EEPS, they are implementing a series of traditional energy efficiency programs, heavily emphasizing lighting. In their initial seven-year (2008-2015) plan proposal, 75% of residential savings were from CFLs. The majority of energy savings for DP&L, however, are in the commercial and industrial sectors, which include government customers, and these business programs offer prescriptive rebates for over 100 measures.

Utilities in Arizona, Michigan, and Ohio are running behavioral pilot programs, such as residential feedback systems. DTE Energy was the only one to say they have definite plans to scale up their behavioral programs.

"Deeper, Then Broader"

In contrast to designing programs around the "Deeper, Then Broader" principle exemplified in Massachusetts and in other states with the most energy efficiency experience, the majority of large utilities in Rapid Start states have been aiming for the narrower target of first-year energy savings. Compliance with annual EERS requirements during the first planning cycle is the top priority.

An exception is Xcel Energy, which has operations in several states. Xcel's Public Service Company of Colorado has used a bundled approach to acquiring deeper savings with their large industrial customers, which includes energy planning. By combining efficiency measures that are not sufficiently cost-effective on their own with measures that exceed the cost-effectiveness threshold, large projects with large energy savings are done that otherwise would not. Xcel is replicating this in the commercial sector through PSCo of Colorado's Energy Design Assistance Program for large commercial buildings and new office buildings. Savings have increased 50% for a small group of customers. Respondents have shared that one key is that the annual planning process that has been business as usual is being displaced by a systems thinking approach. Rather than looking at measures or even projects discretely within the context of a single program or budget year, energy efficiency is viewed holistically over multiple years, facilities, and processes.

Duke is another major multi-state utility that is an example of the more typical approach for Rapid Start states. Duke Energy Ohio is not currently offering additional incentives to customers for installing multiple measures per project. Instead, they are emphasizing broad participation rather than deep savings per customer, in part, at least, to capture as much lighting savings as possible before federal standards take full effect and have their full impact. This is also partially because cost effectiveness is determined at the measure level in Ohio, so less cost-effective end use technologies, even if they add an increment of savings to a project, may be screened out as not satisfying the cost-effectiveness test.

Programs for New Technologies/New Customer Market Segments

For states that have had comprehensive efficiency portfolios running for many years, adoption of an EERS often means extending the dimensions of utility efficiency portfolios to seek out new increments of energy savings. It means adding rebates and technical assistance to support specific efficiency technologies and end uses not previously part of the portfolio, segmenting markets to match program offerings to the needs of targeted niches, and adding or extending programs to reach un-served market segments.

Utilities in the Rapid Start states are in a different situation when it comes to adding in technologies or reaching new market segments for several reasons:

- Time available to design, gain commission approvals, and roll out programs is short, so speed is an issue.
- There is more untapped cost-effective efficiency potential in the Rapid Start states.
- Without extensive program implementation experience in their service territories, utilities in Rapid Start states face greater uncertainty and have less incentive to innovate—and more constraints on innovation.
- In anticipation of federal lighting standards becoming effective, some electric utilities see a relative advantage in capturing a greater share of their energy savings from lighting in before 2012.

An observed pattern in Rapid Start states' electric utility programs is to focus on lighting as the largest end use category and CFLs as the technology to rely on, along with a comparatively small number of other tried-and-true programs, during the first program year. Program administrators add new technologies and market segments as they build up their implementation capacity, staffing, contractor relationships, and market knowledge.

For example, after Consumers Energy in Michigan had an initial pilot program conducted in a limited area that demonstrated the effectiveness of their Appliance Recycling Program, they successfully rolled it out statewide. In the Colorado residential sector, PSCo has been running pilot programs for air conditioning, including early retrofits for central air conditioning systems, a tune-up program, and high-performance installation. They are also offering more services, such as small business lighting and process efficiency services. Small business lighting programs, where PSCo hires a lighting auditor for the small business owner, have been very successful.

ComEd provides another template for moving beyond lighting. Looking ahead to the fourth year of the Illinois EERS, they are engaging with more commercial and industrial customers of all sizes to pave the way for increasing participation in large custom programs that stimulate implementation of non-lighting technologies such as efficient industrial processes, variable speed drives and HVAC, as the percentage savings available from lighting opportunities diminishes overall.

In Ohio, Dayton Power & Light (DP&L) made only minor changes from the first program year to the second, adding on programs for government facility audits and new construction efficiency rebates. American Electric Power (AEP) is doing more and more market segmentation, such as adding programs targeted to agricultural energy customers and to restaurants.

Promoting Participation: Higher Rebates and Enhanced Advertising

Greater than anticipated consumer demand for efficiency program services has been a frequent first year experience for utilities among the states with the fastest-growing programs. According to a Michigan Public Service Commission representative, Michigan utilities reported high participation and energy savings in commercial programs, which ran out of funding in June 2010, especially commercial lighting. Some of the utilities had to decrease their rebates because they were so popular. In spite of this initial burst of participation, Consumers Energy filed an amended efficiency plan for 2011-2014 which increases residential program rebates to compensate for federal tax credits expiring in 2010.

In Illinois, ComEd's early experience was similar to Michigan's utilities, with pent-up demand for efficiency leading to trimming rebate amounts to conserve funds. This changed in their third program year as project sizes plummeted. In response, ComEd increased incentives for replacement of T-12 bulbs with high performance T-8 bulbs, occupancy sensors, and de-lamping T-12 fixtures from 3-lamp to 2-lamp. They also increased bonuses to contractors for larger projects and took out full-page print advertisements in trade publications to promote programs to contractors.

Other program administrators are using traditional approaches to motivate consumers to save more energy—offering higher rebates, more kinds of rebates and other financial incentives, and advertising and promoting more widely and through additional channels. In Colorado, PSCo has numerous program efforts and enhancements underway to increase energy savings in the near term (one to three years). PSCo increased rebates across many programs from 20-25% of the consumer's incremental cost to 40%, and they now offer rebates for more products.

Pennsylvania's EERS requires electric savings of 1% of sales by the end of the second program year, a goal Ohio plans to reach in their fifth year, and Colorado is scheduled to reach in their seventh year. Consequently, the Philadelphia Electric Company (PECO) has been advertising and doing outreach for their PECO Smart Ideas program by television, radio, billboard, and magazine. They also conduct programs such as community seminars; meet with customers at information tables; are adding measures to their commercial and industrial programs; are providing rebates for energy efficient televisions; and are revising incentive levels. To get more immediate savings, they are reducing investment in new construction and their Whole Home Performance programs, and shifting more funds to CFL programs.

Customer Education

In our survey, broad-based customer awareness and education campaigns conducted by utility program administrators were seldom mentioned. One exception was in Ohio, where Dayton Power & Light (DP&L) has a school-based educational program delivered and facilitated by the Ohio Energy Project called "Be E-3 Smart". The E-3 program provides energy savings that DP&L can get credit for, but the stated intent is to have a broader impact. The Ohio Energy Project implements a similar program for AEP Ohio.

Contractor Training

In contrast to consumer education, contractor training and certification programs were cited more frequently as making greater savings possible. Ameren Illinois, for example, has met their increasing savings goals. They attribute this to a combination of the economic rebound, incentives paid to the community of energy efficiency contractors, and to the success of the Building Performance Institute's (BPI) training in increasing the number of certified contractors eligible to participate in the programs. Previously, there were only nine qualified contractors available over a service territory of 44,000 square miles. In neighboring Michigan, Consumers Energy has staff experienced with the successful program model used in the early 1990's, which featured a focus on training and working with their trade allies. Consumers Energy and their implementation contractors developed a list of trade allies and provided a general training session for them on efficiency programs, which covered how to assist customers in filling out complete applications. In 2009, their HVAC program had very high participation rates. HVAC trade allies were very motivated to participate due to reduced demand for their services due to the recession. – Similarly, Consumers Energy worked closely with trade allies, especially with the lighting and HVAC rebate programs, to provide business customers with efficiency program knowledge to support and leverage their marketing efforts.

Market Transformation

Rapid Start states have programs and portfolios designed with a shorter time horizon in mind than states with decades of utility energy efficiency experience and the resulting institutional knowledge and perspective. One utility respondent from a Rapid Start state summed up the relationships among market transformation, the state EERS, and their programs saying, "The three year goal is our world." Another gave examples of what people might define as elements of a market transformation program including an upstream CFL buy-down, school-based energy education, or providing contractor training on HVAC tune-up. One of the program managers in a Rapid Start state shared that as far as market transformation goes, "the utility can play a role, but we don't get [EERS] credit for it. There has to be attribution for [full] utility involvement. The California IOUs get paid for their codes and standards work. We could work with builders on codes, but we need money."

Because most of our contacts for this section were with specific utilities, the statewide view of how market transformation relates to EERSs was not emphasized. An Illinois' ComEd manager said that "as a program, our flavor is resource acquisition . . . We do some trainings—Energy Center of Wisconsin does 12 to 14 trainings for trade allies: electrical contractors, retrofit contracts, new construction. ComEd can't claim savings from MT [market transformation], so we pay for our market transformation work from our Marketing budget." IDCEO does not get credit, either. Market transformation activities such as training for contractors and technical assistance do not count for any savings.

Residential and Commercial/Industrial Sector Funding Allocation

Rapid Start states as a group are not making major changes in funding allocation among residential, commercial, and industrial sectors. The large Michigan IOUs are typical. Detroit Edison's approved Energy Optimization plan holds the allocation of funds among sectors constant through 2015, at 45% commercial and industrial and 55% residential. Consumers Energy's amended plan for 2011-2014, increases spending, primarily on residential gas side and a little on the electric.

OBSERVATIONS FROM LEADING INDUSTRY EXPERTS

As a final source of information for this study, semi-structured interviews were conducted with a group of seven distinguished energy efficiency experts from around the nation. Together, these seven individuals have nearly 200 years of experience in the energy efficiency field, and have worked in or are very familiar with all of the states profiled in this report. The opinions and observations of these experts on a number of key issues are summarized below.[10]

Likelihood of EERS Success

After identifying the leading EERS states that each respondent was most familiar with, and briefly discussing the current situation in those states, respondents were asked for their assessment of the probability (on a zero to 100 scale) that these states would be able to successfully meet their EERS savings goals. Interestingly, with few exceptions, the expectations were very high—typically in the range of 70% to 90%. The few states assessed at 50% or less tended to be states where there had been administrative difficulties and/or where there had been recent changes in political leadership that raised some question about the strength of support for the EERS policy.

This issue of 'political will' was a common theme. One expert working in two of the states with very aggressive EERS requirements phrased it succinctly:

> "I'd rate the likelihood of success from a technical standpoint at 90%. The question is on the political side. Will they follow through and invest the necessary dollars to achieve the savings?"

Most Important Policies to Facilitate EERS Success

Respondents were asked what supporting policies were most important to enable states to meet the higher levels of the EERS requirements. The major observations from our experts are summarized below.

Funding

The most common and nearly universal response was the need to ensure dependable and sufficient funding to get the job done. As one expert put it: "You need a firm commitment and the political will to spend the money necessary." Another expert phrased this in a particularly colorful way:

[10] The experts interviewed in this project are listed in the Acknowledgements. However, in order to protect anonymity and allow these experts to offer candid observations, no opinions or comments are attributed to specific individuals.

> "The goals can't be met without raising public benefits funding, or else you have to use 'magical thinking'—as some propose—to meet goals without more money by lowering incentives, finding more private financing, etc."

Regulatory Mechanisms to Address Utility Motivation

The other most common response was the need to have policies to properly motivate and address the financial concerns of utilities—if one expects them to be cooperative partners in striving to meet the EERS savings goals. Interestingly, there was some divided opinion on whether 'decoupling' to address the concern about sales losses from energy efficiency, or 'shareholder incentives' to provide a positive incentive for achieving energy savings, was the most important policy. At least one expert favored each of those options over the other. But the more common response was that both were needed in order to fully engage utilities in the energy efficiency effort.

One noteworthy nuance to this issue is the need to have incentives not just for meeting the EERS goals, but for exceeding them. As one respondent put it:

> "Utilities need to have a vested financial stake for meeting and exceeding the goals. Need upside financial incentives for the utilities if they are the administrators."

Similarly, another expert pointed to an incentive structure in a particular state that keeps increasing the incentive up to 150% of the goal, noting the value of having "a dynamic that works to push beyond goals".

Regarding the issue of goals, one respondent emphasized the important point that the EERS policy itself needs to set clear, firm and measurable savings requirements for utilities—with consequences—and not just talk about vague future goals.

Rate Design

Another interesting and potentially very important policy area is rate design. As one respondent suggested:

> "May also need to introduce more radical approaches—rate structures/designs—like BC Hydro, which has introduced an increasing block rate. The more you use, the more you pay. As you move to a higher energy use bracket, you pay more. In BC Hydro's case, the rate nearly doubles from the base rate….Might use some kind of customer rating factor to determine applicable rate—highly efficient customers pay a lower rate, inefficient customers pay a higher rate."

Other Types of Energy Policies

A couple of the experts commented that other 'non-utility' related policies could also be helpful. As one noted:

> "Other non-utility supportive policies such as disclosure [of building energy use] and labeling [of both buildings and equipment] can help drive demand for energy efficiency programs. Having state 'climate change' goals can also help."

Finally, several of the respondents opined that beyond specific policies, it was particularly important that policymakers and regulators establish a clear 'tone' and expectation that energy efficiency is important. As one stated:

> "You need a culture and ethos of energy efficiency by the state and the utilities. Need a true commitment by all the key players that energy efficiency is important," and he pointed to the widespread consensus support in California for the "loading order" policy that energy efficiency is the first utility resource.

Most Important Program Design Issues

The experts were also asked what aspects and/or improvements in program design would be most important in enabling states to meet the aggressive new EERS requirements. We received a wide range of responses to this, but there were some common themes.

Comprehensive Approaches

One frequently expressed view was the need to move away from single-measure, prescriptive rebate type programs, and move strongly toward more comprehensive whole-building, "system" based approaches—which can achieve much deeper savings per participant. Some illustrative comments include:

> "We are seeing a need for greater complexity in program delivery….we are moving away from relatively simple, routine prescriptive rebate programs."
>
> "Technologies are available to achieve deep reductions—but especially with lighting, it goes more towards overall design, not just technological change-outs and upgrades."
>
> "We have relied on reaching customers and paying for individual technologies, not necessarily targeting entire buildings and systems."
>
> "We've documented deep savings retrofits (greater than 30% savings), but these tend to be more demonstrations than what's being done routinely at this point through existing programs. We're still at an early stage of development of these advanced programs."

In regard to that concern about a lack of experience with deep retrofits, one interesting suggestion was that, wherever feasible, programs should include an enhanced 'super-efficiency' option for participants, with extra incentives and technical assistance, so that we can start gaining more experience with truly 'deep' energy retrofits.

Multi-Year Plans and Programs

Along with the call for more comprehensive and "deep savings" approaches, several respondents noted the need to shift to a multi-year focus for program design and delivery.

> "We need to accommodate multi-year program designs in order to better serve business customers especially…in order to better fit with their time frames and schedules for considering capital improvements."

In addition, several experts noted the need to adopt a multi-year approach for energy efficiency resource planning and budgeting as well. As one respondent stated:

> "Goals and program plans set on an annual basis lead to a short-term focus, rather than on things that will lead to deeper long-term savings…. Need to ensure that objectives such as market transformation are also incorporated into the plan."

Moreover, another observed:

> "If you have multi-year plans and strategies as a focus, you'll design things differently. Annual plans tend to promote a focus on immediate savings and a dependence on fast-payback measures (i.e., cream-skimming). But that approach tends to make it more difficult to later achieve the more comprehensive, slower payback measures that are necessary in order to achieve 'deep' savings in a building. Having a longer-term perspective allows one to design programs for deep savings from the outset."

Rebates

Several experts commented that we might need larger rebate levels in order to achieve these higher EERS savings levels. It was noted that this logically might be required to move past quick-payback measures and achieve deeper savings in participant buildings, but also that it may be necessary, at least in the short term, to help overcome customer reluctance in the current poor economy.

In addition to program participants, an interesting variant on the rebate issue raised by one expert was the suggestion for additional performance-based incentives for *contractors*—to reward achievement of deeper savings.

Relationships with Customers

Our experts also noted that program incentives needed to not just be bigger, but smarter. In particular, the issue of building better relationships with major customers was emphasized by several respondents.

> "We need to get better working with building owners and understanding them—much more human resource intensive than past efforts. Not just 'dollars for metal,' but emphasize building customer relationships."

Furthermore:

> "For large C&I customers, the most important element for successful programs is having strong account management staff well versed in energy efficiency. The biggest need is for people to be able to communicate with customers effectively….establishing and maintaining trusted relationships is essential."

Specific Measures

In general, our experts did not get to the level of discussing specific measures that will be important in program design to reach EERS targets. One interesting exception was the area of lighting, where a couple of our respondents went out of their way to emphasize that in spite of the impending federal standards, lighting efficiency was going to remain a crucial factor. As one respondent put it:

> "We simply can't achieve the levels of savings without pushing lighting as a primary goal."

The other area mentioned by a couple of our experts was the emerging area of behavioral programs. While much is yet to be learned about whether and how much 'behavioral' strategies can contribute, there is a feeling that there will be value in developing cutting-edge programs in the areas of feedback and other behavior-based interventions.

Biggest Challenges to Meeting EERS Goals

Political Will

The biggest single challenge to meeting the aggressive EERS savings goals identified by our experts was sustaining the political will to provide the necessary funding to operate the energy efficiency programs. In the out years, to reach savings in the neighborhood of 1.5% to 2.0% per year, program funding will have to exceed historical levels by a significant amount. While still modest in comparison to introducing a large new baseload power plant into rates, for example, energy efficiency charges of 4 to 8 mills per kWh may be difficult to sustain politically. As one expert put it:

> "The challenges are not technical and economic [in terms of cost-effectiveness]. We have measures that can accomplish the savings—and more new ones coming all the time. The question is the level of political support and the willingness to spend the money."

As another of our experts observed:

> "The biggest challenge is political. There needs to be a commitment by all the key players that energy efficiency is important."

Financing

A second important challenge respondents noted was the need to develop better 'financing' capability. Even with adequate 'program funding,' in order to achieve deep savings in customer facilities, there will need to be convenient and affordable access to sources of financing. As one of our experts put it:

> "We still need to figure out how to make this financing thing work. And all the recent problems in that industry make this even more difficult—due to the 'risk-averse' climate."

Another noted that for smaller customers:

> "On-bill financing tied to the premise would be very helpful."

Shortage of Skilled and Experienced Staff

One non-monetary "resource" challenge mentioned by several of our experts was the need for more experienced technical staff to deliver energy efficiency programs. One of our experts framed this as follows:

> "We have a lot of new entrants into the field [as a result of these new EERS policies]—lots of young, bright people, but they lack history. We really need training for new employees and entrants to the industry….this is an essential piece."

Another added:

> "Also, utility reps aren't really trained sales staff for energy efficiency; we need to re-train existing staff—and try to hire staff with engineering sales backgrounds."

The Federal Lighting Standards

One significant technical challenge our experts felt might hinder the ability to meet the higher-end EERS goals is the effect of the impending federal lighting standards on the ability to obtain new incremental savings in the lighting area. As one expert noted:

> "A lot of savings have come from CFLs—from 25-50% of total savings. It's uncertain if CFLs will continue to deliver—not sure if we can still count on savings as federal standards become effective. Clearly CFLs won't be providing as much—not sure what will meet the gap."

However, a couple of our experts who have followed the lighting issue closely felt that lighting would still be an important element. As one put it:

> "The federal lighting standards will be some impediment. But some folks are over-reacting to how big of a problem it will be. There should still be substantial lighting savings available (especially as new technologies advance)."

Building Codes

An additional important related challenge noted by several of our experts is the effect of increasingly stringent building codes and standards applied to new construction and major renovation projects. As these policies mandate higher and higher levels of efficiency, it leaves less "room" for energy efficiency "programs" to capture incremental savings in new construction.

One policy approach that has been taken in a few jurisdictions is to allow utilities to claim a portion of the new savings from new building codes—if they helped achieve those new codes. Because of the increasing visibility and importance of that issue, we asked our experts whether such a policy approach would be necessary in order to be able to meet the higher-end EERS requirements (e.g., 2% per year savings).

Interestingly, our sample of experts was nearly evenly divided on that issue, with three feeling the energy efficiency programs can achieve those high savings levels without claiming credit for codes and standards, and four feeling it will be necessary to include some portion of the effects of those policies. Upon further discussion, there was more convergence than divergence in opinion around the importance of this issue. For example, one of the "don't need them" respondents qualified his vote by saying that was only true under the status quo situation. If codes and standards continued to advance, it may be necessary to revisit that conclusion.

Similarly, on a very pragmatic level, one of the 'no' vote experts also noted:

> "It's not technically necessary to claim the effects of codes and standards to reach those high savings levels—a couple of states and utilities have already demonstrated that—but it may become necessary politically."

Overall, there seemed to be a good consensus that (a) codes and standards are very important policies for achieving energy efficiency savings; and (b) the effects of those policies must be carefully considered when thinking about savings to be captured from energy efficiency programs.

Regulatory Technical Issues

Finally, a couple of our experts also cited some regulatory technical issues that can present challenges, such as the choice and stringency of application of certain benefit-cost tests, and how regulators define and enforce aspects such as 'net savings' vs. 'gross savings.' As an example, screening out programs on the basis of the Total Resource Cost (TRC) test can disadvantage programs that require large customer investments in longer-payback energy efficiency improvements….which is increasingly necessary in order to achieve deep energy savings. Similarly, prolonged arguments over things like "free-ridership rates" can impede the path toward the types of large scale, multi-pronged energy efficiency efforts that are going to be necessary. If energy efficiency is going to truly be pursued as a serious, large-scale utility system resource, some of these historical regulatory tendencies regarding energy efficiency programs are going to have to be reformed (e.g., concepts such as the TRC test and 'free-ridership' adjustments are never applied to utility supply-side resources).

Carbon Pricing

One last question we asked our experts about is the issue of carbon costs. Specifically, we asked each respondent the following question: "In terms of reaching and sustaining the higher end EERS targets, how important will it be to establish a price or cost for carbon emissions? (On a 1-10 scale, with 1= no effect and 10 = essential)"

Although most considered it very important, there was some variation. There were two '9s'; one '8 or 9'; one '7'; one '5'; one '0'; and one abstention. Even the highest raters, however, felt that EERS goals *could* be reached without explicit carbon costs, but that having a clear policy that incorporates a cost of carbon would be a great help. Interestingly, several also noted that the effect of a good carbon policy is not just in increasing the cost of fossil fuel energy (thereby further enhancing the cost-effectiveness of energy efficiency), but that policies such as the Regional Greenhouse Gas Initiative in New England can also provide valuable additional revenues to support energy efficiency programs.

Concluding Thoughts from the Expert Interviews

Overall, it is fair to characterize our panel of experts as (a) optimistic about the technical capability of achieving the existing EERS goals in the states; (b) concerned about some of the challenges—especially the issue of sustaining political will to fund the necessary programs; and (c) pragmatic regarding the policy and program design improvements that still need to be made to help ensure that the high-end EERS goals can be consistently achieved.

One of our experts may have summarized things best in noting:

> "There are three key elements needed for EERS success:
> - Strong policies
> - Adequate funding
> - Capable infrastructure "

EARLY RESULTS AND OUTLOOK FOR SUSTAINING HIGH SAVINGS LEVELS

Early Results

ACEEE's concurrent publication, *Energy Efficiency Resource Standards: A Progress Report on State Experience* (Sciortino et al. 2011*),* systematically reviews the early energy-saving results for every state with an EERS in effect for two or more years, or twenty of the twenty-six EERS states. Aside from covering a broader range of states, the progress report's primary purpose is to track savings levels compared to targets and discuss general trends affecting states' performance. While there is overlap between the two reports, the two may be differentiated by the primary research questions they ask. The progress report asks, "Are states meeting EERS targets?"; this report asks, "How do states intend to meet aggressive targets?". In this section, we include a subset of the findings from the *Progress Report.*

For some of the Established Savers states, it is not an entirely straightforward question whether or not utilities are on track to continue meeting goals over the long term. Rapid Starts have been meeting early year targets. For both groups, most EERSs have been implemented or increased recently. Publication of energy savings data and reports, such as those of the Energy Information Administration in the U.S. Department of Energy, may lag more than one year after the end of the program year. Measurement and reporting protocols and conventions vary from state to state. Figure 3 below is a compilation of state results in 2010.

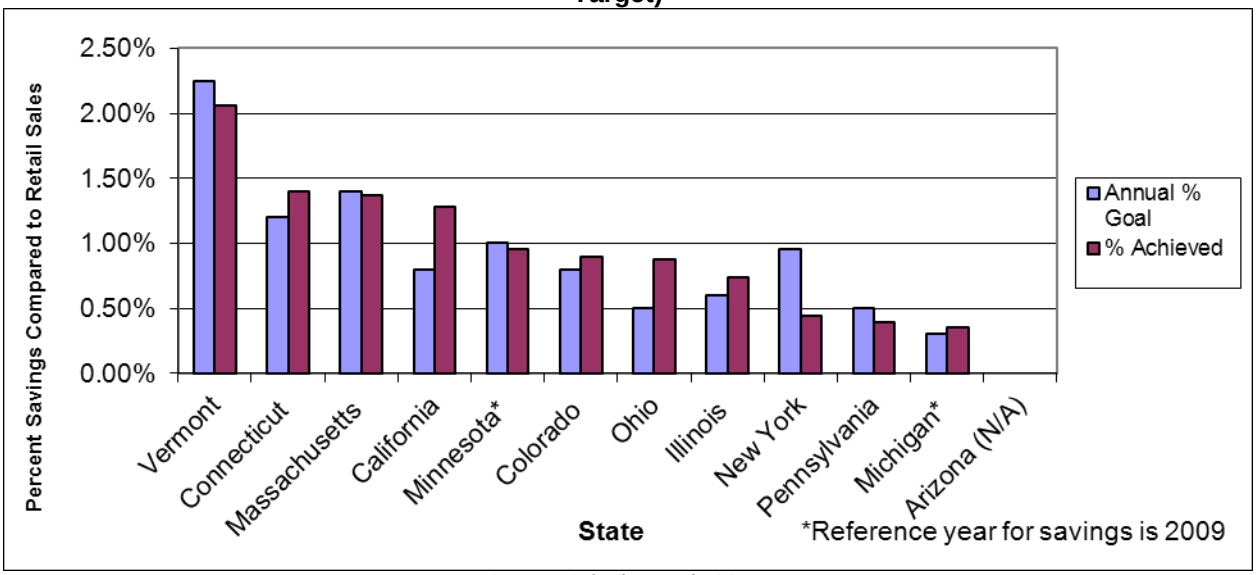
Savings are reported as net annual savings, except for California, which bases current goals and achieved savings on gross annual savings. Saving goals for the California IOU plans must be met over the full 3-year cycle (not annually). Based on non-binding goals for 2010, IOUs are exceeding electricity goals and are close to meeting natural gas goals. [11] The California utilities' evaluated net savings over the three-year 2006-2008 program cycle were much lower, however, and the CPUC report indicated that the utilities fell short of the Commission's adopted goals for that cycle.

California's current EERS policy is embedded in the approved 2010-2012 program portfolios and budgets for the state's IOUs, which call for electricity savings of almost 7,000 GWh, or 3.9% of the IOUs 2008 retail sales, and natural gas savings of approximately 150 MMTh. California IOUs' evaluated net electric savings for the longer period between 2004 and 2008 also fell slightly short of the Commission's adopted goals, achieving 9,442 GWh of savings, or about 1% annually throughout the program period.[12] The utilities plan to make up for these shortfalls in the 2010-2012 program cycle.

[11] Program performance reports to-date for the California investor-owned utilities are posted in a highly usable format at http://eega.cpuc.ca.gov/

[12] Compared to 2008 investor-owned utility retail sales as reported by the Energy Information Administration

Figure 3: Most Recent Year Electric Savings Compared to Goal (or Savings Target)[13]



Source: Sciortino et al., 2011.

New York and Minnesota respondents cited the effects of the recession and the overall state of the economy as factors that contributed to their lower savings levels. As shown below in table XX, Minnesota utilities have been increasing electric savings each year, but had not reached the 1% target statewide by the end of 2009. State policy sets an electric target of 1.5% annual savings beginning in 2010, of which 1% must come from utility programs, and up to 0.5% may be from codes, standards, transmission and generation improvements.

Table 6: Minnesota Statewide Electric Savings Achieved from Conservation Improvement Programs, 2006-2009

Year	Statewide Electric Savings Achieved (MWh)	Savings as % of 2007 sales	IOU Natural Gas Savings (MCF)	Savings as % of average sales[14]
2006	411,999	0.60%	N/A	N/A
2007	468,070	0.68%	N/A	N/A
2008	597,288	0.87%	1,534,121	0.54%
2009	648,163	0.95%	1,777,369	0.63%

Source: [MOES 2010]

In New York, NYSERDA and the investor-owned utilities are performing below the EEPS goals, but trends indicate the state is on track to meet its long-term targets. NYSERDA and the IOUs combined to meet 46.8% of their savings goal through 2010 but spent only 35.9% of what was budgeted for programs. Natural gas programs fared somewhat better, achieving 50.9% of the energy savings goal and spending only 40.9% of the total budget through 2010.

[13] California gross savings and targets adjusted to net savings using 61% of conversion factor. California savings include partial savings from advanced codes and standards adopted in the state. California, Iowa, and Washington savings and targets based on IOUs reporting savings as of 2010 only. New York based on NYSERDA and utility program administrators only. Colorado includes only PSCo. Ohio does not include First Energy.

[14] Based on "average sales" figures presented in CIP Energy and Carbon Dioxide Savings Report for 2007-2008.

Table 7: Electric Savings and Spending as percent of targets through 12/31/2010, by Program Administrator

Program Administrator	Percent of Net MWh Target Achieved	Percent of Budget Spent
Central Hudson	31.5%	37.2%
Con Edison	22.4%	24.6%
Niagara Mohawk	50.3%	72.2%
NYSEG	13.1%	20.0%
Orange and Rockland	23.9%	22.4%
Rochester Gas & Electric	27.9%	26.9%
NYSERDA	54.2%	29.9%
NEW YORK STATE	**46.8%**	**35.9%**

Source: NYPSC

Table 8: Natural Gas Savings and Spending as Percent of Targets Through 12/31/2010, by Program Administrator

Program Administrator	Percent of Net Dekatherm Target Achieved	Percent of Budget Spent
Central Hudson	65.4%	74.2%
Con Edison	8.1%	17.4%
Corning	111.2%	106.7%
KED-LI	77.4%	71.1%
KED-NY	28.5%	30.9%
Niagara Mohawk	137.4%	95.0%
NYSEG	127.0%	126.1%
O&R	157.8%	118.0%
RG&E	166.8%	142.6%
St. Lawrence Gas	55.9%	49.8%
NYSERDA	28.0%	25.6%
NEW YORK STATE	**50.9%**	**40.9%**

Source: NYPSC

In Connecticut, energy savings results have been more variable relative to annual standards. As the table below illustrates, the state's programs funded by the Connecticut Energy Efficiency Fund (CEEF) have been near or above the 1% annual savings for three consecutive years, meeting CLM goals in two of the last three.[15] The dip in savings in 2009 was due to a cut in funding to the CEEF. These figures include programs administered by both IOUs and municipal utilities.[16]

[15] Since CHP is included in the Class III targets, comparing energy efficiency savings to the RPS goals would not be accurate. Currently, there is no analysis of progress towards meeting Class III RPS targets.

[16] For most recent information on municipal utilities' performance, see Energy Efficiency Services 2009 Annual Report, Connecticut Municipal Electric Energy Cooperative.

Table 9: Connecticut Statewide Energy Efficiency Savings vs. Goals 2008-2011

	2008		2009		2010		2011	
	Goal	**Actual**	**Goal**	**Actual**	**Goal**	**Actual**	**Goal**	**Actual**
Electric Energy Efficiency Savings (GWh)	250	368	277	237	360	423	325	N/A
As Percent of Sales*	**0.8%**	**1.2%**	**0.94%**	**0.8%**	**1.2%**	**1.4%****	**1.1%**	N/A

Source: 2009, 2010 and 2011 Conservation and Load Management Plans; CL&P et al 2011
Note: Data includes low-income programs
*Based on same year sales
**Based on 2009 Sales

In 2008 Vermont achieved unprecedented savings levels equal to 2.5% of annual sales, exceeding its MWh goal for the 3-year period. In 2007 and 2008, savings from energy efficiency measures more than offset the average underlying rate of electricity load growth. Savings dropped slightly to 1.6% in 2009, but rebounded significantly in 2010 as the state once again exceeded 2% annual savings. Judging performance on an annual basis, Vermont almost met over 90% of its goal in 2010, but at 3.7% savings over two years, it will need to make up for lost ground in order to meet the three year of 6.75% savings by the end of 2011.

Table 10: Efficiency Vermont Energy Efficiency Savings Achieved vs. Targets

2006-2008 Achieved (MWh)	2006-2008 Goal (MWh)	Percent Attained	2009 Savings Achieved (MWh)	2010 Savings Achieved (MWh)	2009-2011 Goal (MWh)	Percent Attained
311,000	261,700	119%	85,000	114,000	360,000	55%

Sources: Efficiency Vermont, 2009 Annual Report; 2010 Savings Claim; 2011 Annual Plan

According to the fourth quarter report from the Massachusetts Program Administrators in 2010, the state is on track to meet its 2010 electric and natural gas requirements. The preliminary data shows PA's meeting 98% of their MWh goals, 103% of their Therms goals, and spending less than the allotted budget on electric and natural gas programs.[17]

Table 11: Massachusetts Electric Savings Targets and Savings Achieved, 2010-2012

Year	Savings Target as Percent of Sales	Savings Goal (MWh)	Electric Savings Achieved (MWh)	Percent of Target Achieved
2010	1.4%	625,004	609,788	98%
2011	2.0%	897,232		
2012	2.4%	1,103,423		
2010-2012	**5.8%**	**2,625,083**		

Note: Data is preliminary and subject to revision and check.
Source: Quarterly Report of the Program Administrators, Fourth Quarter, 2010. February 3, 2011.

[17] A report with verified savings will be issued in mid- to late-2011.

Table 12: Massachusetts Natural Gas Savings Targets and Savings Achieved, 2010-2012

Year	Savings Target as Percent of Sales	Savings Goal (Therms)	Natural Gas Savings Achieved (Therms)	Percent of Target Achieved
2010	0.63%	13,586,666	13,926,865	103%
2011	0.89%	19,087,301		
2012	1.15%	24,687,219		
2010-2012	**2.67%**	**56,368,432**		

Note: Data is preliminary and subject to revision and check.
Source: Quarterly Report of the Program Administrators, Fourth Quarter, 2010. February 3, 2011.

Rapid Start states are meeting their electric savings targets in the early years. Colorado has exceeded their EERS electric plan savings, led by Xcel Energy's Public Service Company of Colorado. Three out of the four largest IOUs in Ohio are meeting their goals. For the first two program years, Illinois' major IOUs also met the requirements, as did Michigan's. Many Pennsylvania programs were just being rolled out in 2010, yet for some, the program administrators reduced rebate levels due to overwhelming response in order to stay within budget. This suggests that Pennsylvania's experience may be similar to those of Illinois and Michigan. In 2010, Arizona's Tuscon Electric Power (TEP) and Arizona Public Service (APS) reported that they achieved annual energy savings equivalent to 1.1% of retail energy sales. TEP and APS are the two largest electric utilities in Arizona.[18]

In neighboring Colorado, 2009 was the first year that savings goals took effect and the first year in which Public Service Company of Colorado (PSCo), the largest utility in the state, had a complete and comprehensive efficiency plan in place. PSCo's natural gas savings were 308,761 Dth, or 97% of the goal the Commission-approved plan.[19]

Table 13 : Colorado Electric Utility Savings Targets and Results Achieved as % of Sales

Utility	2009 Target	2009 Achieved	2010 Target	2010 Achieved	2011 Target	2020 (Cumulative 2012-2020)
PSCo	0.6%	**0.8%**	0.8%	**0.9%**	0.9%	13.75%
Black Hills Energy	0.53%	**0.23%***	0.76%	N/A	0.80%	

*Program year beginning July 1, 2009 ending June 30, 2010

Leveraging parent company Xcel Energy's years of program delivery experience in Minnesota, PSCo surpassed their planned 2009 and 2010 electricity savings goals, saving 220 GWh at the generator level in 2009 and 253 GWh in 2010.[20] Black Hills Energy (BHE) was less successful in the 2009/2010 program period. BHE notes in its 2009/10 Annual Status Report that it received approval of its programs only a month prior to the July 1st, 2009 start date, which did not give the utility enough time to design and execute programs in time for the 2009 Summer. As a result, savings and spending fell below targets for the year. BHE spent $1.4 million and saved 4,554 MWh—58% and 44% of their respective targets.[21]

In Ohio, according to self-reported data, AEP, Duke Energy, and DP&L exceeded their requirements in 2009 and 2010. First Energy fell far short in 2009 and will report on its 2010 savings in May 2011.[22] Program portfolios for AEP, DP&L, and Duke Energy as a whole were cost-effective in 2010.

[18] SWEEP Regional Energy Efficiency News, http://www.swenergy.org/news/news/default.aspx?Year=2011#331
[19] Docket No. 08A-366EG. 2009 Demand-Side Management Annual Status Report, 4/5/10
[20] Docket No. 08A-366EG. 2009 Savings data from 2009 Demand-Side Management Annual Status Report, 4/5/10; 2010 Savings data from Fourth Quarter Colorado DSM Roundtable Update, 2/15/11.
[21] Black Hills Energy Colorado Electric Annual Status Report Energy Efficiency Programs 2009-2010
[22] PUCO staff has yet to file rulings on the energy efficiency status reports of any utilities, as required, to confirm compliance with benchmarks.

Unable to ramp up programs quickly, FirstEnergy received a waiver from the PUCO allowing it to meet the remainder of its 2009 requirements in future years.[23] Most recently, the PUCO waived annual requirements for FirstEnergy for 2009, 2010, 2011, and 2012. Instead, First Energy will be required to meet a cumulative benchmark by the end of 2012.[24] PUCO ruled that the Portfolio Plan, as filed by FirstEnergy, was not designed to meet the benchmarks in 2010, which PUCO addressed by allowing FirstEnergy to still comply by meeting a cumulative 2012 target (2.3%). FirstEnergy has applied for rehearing regarding whether the plan was designed to achieve 2010 benchmarks, the results of which are pending at the Commission.

Table 14: Ohio Electric Energy Efficiency Performance by Utility in 2009 and 2010

Utility	2009 Requirement (MWh)	2009 Achieved (MWh)	Percent Attained	2010 Requirement (MWh)	2010 Achieved (MWh)	Percent Attained
American Electric Power[25]	136,944	**171,000**	125%	228,125	**306,000**	134%
Dayton Power & Light[26]	43,193	**40,442**	94%	71,781	**101,061**	141%
Duke Energy[27]	68,127	**86,402**	127%	109,420	**310,755**	284%
First Energy[28]	166,310	**22,614**	14%	N/A	N/A	N/A
Total	**414,574**	**320,458**	**77%**	**409,326**	**717,816**	**175%**

Each utility has submitted plans to achieve their requirements through at least 2011, detailing program portfolios, budgets, and expected savings. Utilities also submit long-term plans forecasting their ability to meet targets in 2025. Except for Duke Energy, each utility projected savings levels in line with future requirements (Woodrum, Stephens, & Hollingsworth 2010). In its long term forecast report, Duke Energy projected that it would not be able to cost-effectively achieve the long-term 22% requirement, forecasting that it could only meet 14 to 15 percent.[29] After a series of negotiations with stakeholders, however, Duke Energy agreed to a settlement agreement in which it agrees that "it is reasonable for Duke to assume that sufficient, cost-effective energy savings opportunities exist to allow the Company to meet the energy efficiency and demand reduction benchmarks stated in R.C. 4928.66 over the 10-year forecast period." It also states that CHP is a potentially cost-effective option for assisting Duke to meet its resource requirements.

Illinois utilities faced a rush of demand for their energy efficiency programs in the first two years of the EERS. The Department of Commerce and Economic Opportunity's (DCEO), responsible for 25% of the statewide savings, faced different challenges. One was that goals for the first program years were much higher as a percentage than the IOUs (0.6% vs. 0.2%). The DCEO claims numerous factors prevented outright success for its public sector and low-income programs, such as the economic downturn and its effect on government and school budgets.

Table 15 : Illinois Electric Efficiency Savings 2008-2010

Utility	2008-2009 (PY 1) Requirement (MWh)	2009 Achieved (MWh)	Percent Attained	2009-2010 (PY 2) Requirement (MWh)	2010 Achieved (MWh)	Percent Attained
ComEd	148,842	**163,717**	110%	315,223	**456,151**	145%
Ameren Illinois	62,808	**89,955**	143%	118,288	**142,995**	121%
DCEO	54,572	**27,285**	50%	110,715	**72,331**	65%

Sources: ComEd Year 1 Evaluation Report; ComEd Year 2 Evaluation Report; Ameren Illinois Year 1 Annual Report; Ameren Illinois Final PY2 Monthly Report September 2010; DCEO Program Year 2 Evaluation

[23] Order, January 7, 2010, Docket 09-1004-EL-EEC, et al.
[24] Order, March 23, 2011, Docket 09-1947-EL-POR, et al.
[25] Savings calculated on a pro-rated basis. 2009: Docket No. 10-0318-EL-EEC; 2010: 11-1299-EL-EEC
[26] Savings calculated on a pro-rated basis. Docket No. 10-0303-EL-POR; 2010: 11-1276-EL-POR
[27] Calculated as incremental savings. 2009: Docket No. 10-0317-EL-EEC (Appendix A); 2010: 11-1311-EL-EEC
[28] Requirements for 2009 through 2012 waived. 2009 savings achieved filed in Docket No. 10-0277-EL-EEC
[29] Duke Long Term Forecast Report 2010

Pennsylvania electric distribution companies (EDCs) officially began implementing programs counting towards their EERS on June 1, 2009. The 2nd quarter report of Program Year (PY) 2 indicates all of Pennsylvania's utilities are achieving significant savings.[30] Through November 2010, utilities had achieved approximately 58% of the 2011 goal, roughly on track to meet the 1% savings goal by June 2011.[31] Results for Program Year 2 have been promising given that in Program Year 1 utilities only achieved approximately 20% of the two-year goal. In the cases of Allegheny, Met-Ed, and Penelec, savings in the 1st quarter of Program Year 2 exceeded all of those of PY 1. Twenty-seven programs began in the 1st quarter of PY 2, compared to 38 initiated in all of PY 1. The presence of a Statewide Evaluator (SWE) has been an extremely positive development for the state's utilities. The SWE provides timely reports that allow utilities to gauge performance and verify savings.

Table 16: Pennsylvania EERS Targets vs. Achieved

Program Administrator	Percent of 2011 Target Achieved end of PY 1	Percent of 2011 Target Achieved end of 2nd Quarter, PY 2	Percent of 2013 Target Achieved to date
Allegheny	1.4%	1.4%	0.5%
Duquesne	19.0%	22.4%	7.5%
Met-Ed	8.2%	37.1%	12.4%
Penelec	8.9%	45.4%	15.1%
Penn Power	11.7%	46.0%	15.3%
PECO	40.0%	113.0%	38.0%
PPL	22.0%	62.0%	21.0%
STATEWIDE*	**19%**	**58%**	**19.3%**

Source: Act 129 Statewide Evaluator Quarterly Report, Program Year One and Second Quarter, Program Year Two
*ACEEE Estimate, not endorsed by PA PUC

Overall, Michigan Energy Optimization (EO) program savings for electric and natural gas achieved 129 percent of the statewide target in 2009. IOUs achieved 130 percent of their savings target, while municipal utilities reached 107 percent of their savings targets and electric cooperatives met 17 percent of their target (MPSC 2011). The Commission recently approved EO plans from Detroit Edison and Consumers Energy in which both utilities plan to exceed electric and natural gas savings targets every year through 2015.[32]

Table 17: Michigan Electric Energy Efficiency Requirements and Savings, 2009-2011

	2009 Requirement (MWh)	2009 Achieved (MWh)	Percent Attained	2010 Requirement (MWh)	2011 Requirement (MWh)
Statewide Electric EO Program Savings	326,056	375,652	129%	502,797	742,451

[30] Pennsylvania has a Statewide Evaluator, which reports on implementation status quarterly. As of the drafting of this report, the latest confirmed savings data comes from Program Year 2 (2010-2011) 2nd Quarter Report.
[31] Through six of the eight quarters given for utilities to meet the 1% goal in 2011, the theoretical "on-track" savings figure would be 66.6%.
[32] DTE: U-15806-EO Amended; MichCon: U-16412 Amended December 2010

Prognosis

Established Savers

Looking forward, the most frequent expectation expressed by those in Established Savers states is that EERS goals will be met in coming years, and that this will be done by extending proven approaches and by pursuing innovations in program design, funding, and delivery.

This is the case in California, New York, Vermont, and Minnesota. The CPUC and the utilities are cautiously optimistic about the utilities meeting the 2010-2012 program savings goals. Achievement of the energy saving goals from the California IOU plans is viewed over the full 3-year cycle, not annually. Most of the IOUs met or were close to meeting estimated savings goals for 2010. The largest program administrators in New York all expect the '15 by 15' statewide goal (15% energy savings by 2015) to be reached, in spite of early results below target. The near-term shortfall in program performance can be attributed to delays in program approval, as well as new program administrators ramping-up programs. However, results show that energy savings with respect to funding spent is ahead of targets. Specifically, as of Dec. 31, 2010, only 37% of the budget for 2009-11 had been spent, while 51% of the net dekatherm target had been acquired, and 47% of the MWh net savings goal had been achieved (NYPSC 2011). The 2009-10 and 2011 budgets and savings targets for each utility were combined by the New York Public Service Commission to give program administrators time to overcome barriers resulting from the program ramp-up.

Vermonters were the most optimistic, looking forward to electricity savings above 2% and approaching 3% into the future.

Minnesotans were the least optimistic of the established savers. Current findings of achievable potential do not support saving 1.5% per year beyond 2015 using traditional programs and current technologies, even with up to 75% rebate levels. Xcel Energy, who runs the largest electric utility in the state, will strive to meet the electric 1.5% goal over the long term, possibly during the next triennial planning period from 2013 to 2015.

In Massachusetts and Connecticut, predictions of future savings hinged in large part on how much and how consistently program funding will be available in years to come. Program Administrators will be looking to private investors, possibly federal carbon revenue, and to bringing in banks and local credit unions to expand lending for energy efficiency at zero interest or very low interest.

Rapid Starts

The highest expectations for sustained savings were from respondents in Michigan and Pennsylvania. Detroit Edison and MichCon both expect to be—and have MPSC-approved Energy Optimization Plans for—exceeding EEPS savings levels every year through 2015. Consumers Energy says they will be able to sustain savings levels into the future. They anticipate over the long term that they will need to go to the next tier of higher savings after they get the low hanging fruit.

Pennsylvania utilities could face up to a $20 million fine if savings standards are not met by May 2011 and by May 2013. One representative of a major IOU expressed "absolute 100% confidence" that they will be in compliance.

In Colorado, there is concern that by 2014 or 2015 there may be a gap between the savings targets and what the current portfolio of traditional programs can deliver. Xcel Energy, owner of Public Service Company of Colorado, is trying a number of innovative approaches and pilot projects to prepare for closing that gap.

While the largest IOUs in Illinois have gotten a strong start, all the largest Illinois program administrators agree that when the 2% spending caps are reached, the annual savings goals will not be met. Some believe there will be an effort to raise the spending limits.

The major Ohio utilities with approved efficiency programs in the field have been hitting their targets until now, however, they expressed their views of the future as contingent on many factors. Some of these factors include: the treatment of "Mercantile" customer savings, changes to codes and standards and how utilities may or may not get credit for part of the savings due to them, and possible policy changes to reduce the EERS goals themselves. Mercantile savings are their own category of savings addressed separately in the law. Their regulatory treatment has been a point of controversy.

FINDINGS AND CONCLUSIONS

This report compiles and examines the perspectives of utility program managers and leading industry experts on how states are responding to new EERS policies establishing substantial energy efficiency savings requirements. The project focuses on twelve states with strong EERS requirements—six "Rapid Start" states with little or no prior efficiency activity in the years leading up to the adoption of an EERS, and six "Established Savers" states with extensive, long-running, and comprehensive energy efficiency systems.

As the resource procurement era of energy efficiency enters its tenth year, more than half the states in the United States have enacted energy efficiency resource standards. States have made and are making major changes in energy policy to support the fulfillment of the goals of their energy efficiency resource standards. These legislative and regulatory actions to support EERSs include:

Increasing funding

States have increased funding for natural gas and electric utility energy efficiency programs in sync with stepped-up savings standards by an order of magnitude or more. Many states increased funding from millions to tens of millions per year. California's annual energy efficiency budgets have crossed the $1 billion threshold. For Established Savers, funding for electric efficiency more than doubled from $840 million in 2006 to $1,776 million in 2009. Natural gas efficiency funding almost tripled from $160 million in 2006 to $492 million in 2009. Six Rapid Start states' electric funding exploded from $73 million in 2006 to $351 million for 2009 and $600 million for 2010. Natural gas efficiency funding in those six states increased by an even greater multiple, rising from just $3 million in reported spending in 2006 up to budgets totaling $86 million in 2009.

Enacting and expanding decoupling and shareholder incentives

Established Saver states, many with decades of experience and expertise with energy efficiency portfolios, have learned the importance of regulatory policy for creating the business environment that will move and inspire utility program administrators to save more energy. All six have some form of decoupling and shareholder incentives in place. Utilities with approval for decoupling and shareholder incentives are less prevalent in the Rapid Saver states.

Using approaches beyond utility efficiency programs

Resource standards are not all written to rely solely on utility efficiency programs to achieve their energy savings goals, especially in Established Saver states. Often used in conjunction with, and in addition to, traditional utility energy efficiency programs, other vehicles contribute as well, such as tightening energy use in building codes, raising appliance efficiency standards, and authorizing and encouraging efficiency enhancements to transmission and distribution infrastructure. New York is the leading exemplar of this approach, where the state "15% by 2015" goal will be met by approximately one-third savings resulting from codes and standards and transmission and distribution efficiency

improvements. Rapid Start states currently rely primarily on utility savings to meet their EERS targets.

Creating and supporting stakeholder collaboratives

Many states have set up multi-stakeholder groups and processes to enhance collaboration and coordination, share program ideas and expertise, and smooth the path to achieving state EERS policy goals. Across the map, in both groups of states, respondents valued the contributions of both temporary and standing collaboratives and found their participation useful.

The leadership provided by the states policy makers and regulators in these four areas has changed the field that utility program administrators and implementation contractors play on. It has become a fertile environment for the innovation, growth, and development of utility efficiency programs and portfolios that are needed to achieve the aggressive EERS goals. Utility program administrators are responding. Major trends included:

Capturing lighting savings early and adding new, higher-efficiency technologies to efficiency portfolios beyond CFLs

Many respondents expressed that diminishing savings opportunities for CFLs and the expected impact of higher federal lighting efficiency standards was creating pressure to go beyond past practices, especially after 2012. Rapid Start states in particular have planned programs to capture as much savings as possible from lighting in the first few years of their resource standards. Established Savers, with less available efficiency potential and declining attribution of savings to IOU programs, are shifting toward new technologies. In Vermont and Connecticut, they are shifting program resources into specialty CFLs, three-way, and dimmable lamps. California has a major, multi-year strategy to transform the HVAC markets.

Adopting new program design approaches and strategies, including "Deeper, Then Broader"

Massachusetts has led the way among Established Savers with the explicit creation of a long-term strategy to optimize the achievement of statewide savings by designing programs to get deeper savings per project up front. All six states use some variation of this approach. By considering cost-effectiveness at the project level or higher rather than measure-by-measure, bundling quick-payback measures with longer-term ones, and providing rebates for gas and electric measures on the same project, they get deep savings from the start. As EERS increase, programs can go after building program participation and continue to preserve cost-effective opportunities, as they have avoided the temptation for "cream skimming". Rapid Start states have not taken advantage of similar strategies as widely, often under pressure to meet steep increases in savings goals under relatively restrictive cost-effectiveness tests, spending caps, and time constraints.

Starting programs for new technologies and new customer market segments

In Established Saver states in particular, portfolios are getting "wider" as administrators provide rebates and assistance to support an ever-greater array of efficiency technologies. For example, the New York Public Service Commission had approved plans for 99 different programs by the end of 2010. Simultaneously, there is an observed trend to focus programs on specific industry and customer segments, tailoring rebates and services to procure the most savings from niches such as restaurants, data centers, hospitals and hotels. Rapid Starts are also adding new programs, but for different reasons and in response to different market and regulatory forces. For the most part, they are beginning with a smaller number of core programs selected as the lower-risk, higher savings choices.

Promoting participation through upstream rebates, more rebates and enhanced advertising

In Established Saver states, program administrators continue to enhance and extend traditional program approaches to motivate more utility customers to save more energy through their efficiency programs. They are doing more advertising, finding ways to make participation easier and more

convenient (especially through upstream and midstream lighting and appliance rebates), and offering higher rebates to more customers. Reaching customers through YouTube, making 99-cent CFLs ubiquitously available—and simply paying more to gain the customer's participation—are now widespread. The reverse has sometimes been the case in Rapid Start states such as Illinois, Michigan, and Pennsylvania, where they have seen a rush of pent-up demand during the first program year, leading programs to cut rebates in order to preserve budget dollars.

The input that we received from efficiency program managers and program administrators had much less emphasis on other areas. With some exceptions, respondents did not mention customer outreach and education, contractor training and certification, or broader long-term efforts at market transformation as primary means to comply with EERS requirements. Most of the energy saved from initiatives in these areas is difficult and expensive to measure, and the utilities do not get full credit toward their savings goals for their efforts. While all are important, even critical, for acquiring savings in the long term, in the context of EERS requirements, program administrators must focus their attention on energy savings they will get credit for.

Observations from Industry Experts

The group of seven energy efficiency experts felt that the states about which they were most knowledgeable would be successful in meeting their EERS savings goals. To the extent that this was not the case, they pointed to administrative difficulties or recent changes in political leadership that raised some question about the strength of support for the EERS policy, not a lack of the cost-effective achievable potential. The level of financial investment was a major variable, whereas the inherent potential of programs to perform and attain the energy savings was not specifically called into question.

When asked about the most important factors to facilitate EERS success, experts agreed that funding and regulatory mechanisms to address utility motivation were primary. Rate design, building energy use disclosure, building and equipment labeling, and having state climate change goals also help drive demand for utility energy efficiency programs. Several industry experts also noted that it was particularly important that government officials establish a clear 'tone' and expectation that energy efficiency is important.

The experts confirmed what utilities reported on the importance of the following program design elements:

- Comprehensive approaches that moved beyond single-measure, prescriptive rebate based programs to acquire deep savings
- Multi-year plans and programs, especially for business customers
- Higher rebate levels
- Building better relationships and improvement understanding of customer needs, especially for large commercial and industrial customers
- Continued emphasis on lighting measures

Experts identified corresponding challenges as well, such as political will, financing, shortage of skilled staff, federal lighting standards, building codes, and technical regulatory issues.

Early Results and Outlook

Early results from the first few years of new or expanded EERSs demonstrate growing successes in procuring ever-greater energy efficiency resources. Programs in Rapid Start states are often exceeding their targets in initial years. Established Savers' results have been less consistent relative to their annual efficiency standards in recent years, especially in those states with the longest-running and most extensive programs. In spite of the magnitude of the challenges, with a few exceptions, from the viewpoints of the states and utilities, the prognosis for hitting EERS targets is good.

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APPENDIX A: SUMMARY OF STATE EERS POLICIES

State Year Enacted Electric/Natural Gas Policy Type	Energy Efficiency Resource Standard	Reference
Massachusetts[33] 2009 Electric and Natural Gas EERS	Electric: 1.4% in 2010, 2.0% in 2011; 2.4% in 2012 Natural Gas: 0.63% in 2010, 0.83% in 2011; 1.15% in 2012	Electric: D.P.U. Order 09-116 through 09-120) Natural Gas: D.P.U. Order 09-121 through 09-128
Vermont 2000 Electric Tailored Utility Targets (Efficiency Vermont)	~6.75% cumulative savings from 2009 to 2011	30 V.S.A. § 209; VT PSB Docket 5980; PSB Contract[34]
Arizona 2009 Electric EERS	2% annual savings beginning in 2014., 22% cumulative savings by 2020	Docket Nos. RE-00000C-09-0427, Decision No. 71436
Illinois 2007 Electric and Natural Gas EERS	Electric: 0.2% annual savings in 2008, ramping up to 1% in 2012, 2% in 2015 and thereafter Natural Gas: 8.5% cumulative savings by 2020 (0.2% annual savings in 2011, ramping up to 1.5% in 2019)	S.B. 1918 Public Act 96-0033 § 220 ILCS 5/8-103
New York 2008 Electric and Natural Gas EERS	Electric: 15% Cumulative savings by 2015 Natural Gas: ~14.7% Cumulative savings by 2020	Electric: NY PSC Order, Case 07-M-0548 Natural Gas: NY PSC Order, Case 07-M-0748
Minnesota 2007 Electric and Natural Gas EERS	Electric: 1.5% annual savings beginning in 2010 Natural Gas: 0.75% annual savings from 2010-2012; 1.5% annual savings in 2013	Minn. Stat. § 216B.241
Iowa 2009 Electric and Natural Gas Tailored Utility Targets	Electric: Varies by utility from 1-1.5% annually by 2013 Natural Gas: Varies by utility from 0.74-1.2% annually by 2013	Senate Bill 2386 and Iowa Code § 476

[33] The underlying statute, Mass. General Laws c. 25 § 21, requires gas and electric efficiency program administrators to procure "all energy efficiency and demand reduction resources that are cost effective or less expensive than supply."
[34] Goals for 2009 and 2010 were combined. Efficiency Vermont also set goals in previous years in three-year intervals.

State Year Enacted Electric/Natural Gas Policy Type	Energy Efficiency Resource Standard	Reference
Rhode Island 2006 Electric and Natural Gas Tailored Utility Targets	Electric: ~1.3% in 2010; 1.5% in 2011; Council proposed 1.7% in 2012, 2.1% in 2013, and 2.5% in 2014 Natural Gas: ~0.4% of sales in 2011; Council proposed 0.75% in 2012, 1.0% in 2013, and 1.2.% in 2014	R.I.G.L § 39-1-27.7
Ohio 2008 Electric EERS	22% by 2025 (0.3% annual savings in 2009, ramping up to 1% in 2014 and 2% in 2019)	ORC 4928.66 et seq. S.B. 221
Indiana 2009 Electric EERS	0.3% annual savings in 2010, increasing to 1.1% in 2014, and leveling at 2% in 2019.	Cause No. 42693, Phase II Order
Maryland 2008 Electric EERS	15% per-capita electricity use reduction goal by 2015 with targeted reductions of 5% by 2011 calculated against a 2007 baseline (10% by utilities, 5% achieved independently)	Md. Public Utility Companies Code § 7-211
Maine 2010 Electric and Natural Gas Tailored Utility Targets (Efficiency Maine)	Electricity: Annual energy savings of ~1% in FY2011, ramping up to 1.4% in FY2013. Natural Gas: 130 BBtu annually by FY2013	Efficiency Maine Trust: Triennial Plan
Colorado 2007 Electric and Natural Gas Tailored Utility Targets	Electric: PSCo and Black Hills Energy (BHE) both aim for 0.9% of sales in 2011 and increase to 1.35% (1.0% for BHE) of sales in 2015 and then 1.66% (1.2%) of sales in 2019 Natural Gas: Savings targets commensurate with spending targets (at least 0.5% of prior year's revenue)	Colorado Revised Statutes 40-3.2-101, et seq. ; COPUC Docket No. 08A-518E; Docket 10A-554EG

State Year Enacted Electric/Natural Gas Policy Type	Energy Efficiency Resource Standard	Reference
Wisconsin 2010 Electric and Natural Gas EERS	Electric: 0.75% in 2011, ramping up to 1.5% in 2014. Natural Gas: 0.5% in 2011, ramping up to 1% in 2013	Order, Docket 5-GF-191
Connecticut[35] 2005 Electric	~1% annual savings 2008-2011	Public Act 07-242 of 2007
California[36] 2004 and 2009 Electric and Natural Gas EERS	Electric: ~1% annual savings through 2020 Natural Gas: 150 gross MMTh by 2012	CPUC Decision 04-09-060; CPUC Decision 08-07-047; CPUC Decision 09-09-047
Washington 2006 Electric EERS	Biennial and Ten-Year Goals vary by utility. Law requires savings targets to be based on the Northwest Power Plan, which estimates potential savings of about 1.5% savings annually through 2030 for Washington utilities.	Ballot Initiative I-937 WAC 480-109 WAC 194-37
Michigan 2008 Electric and Natural Gas EERS	Electric: 0.3% annual savings in 2009, ramping up to 1% in 2012 and thereafter Natural Gas: 0.10% annual savings in 2009, ramping up to 0.75% in 2012 and thereafter	M.G.L. ch. 25, § 21; Act 295 of 2008
Oregon 2010 Electric and Natural Gas Tailored Utility Targets (Energy Trust of Oregon)	Electric targets are equivalent to 0.8% of 2009 electric sales in 2010, ramping up to 1% in 2013 and 2014. Natural Gas: 0.2% of sales in 2010 ramping up to 0.4% in 2014	Energy Trust of Oregon 2009 Strategic Plan
Pennsylvania 2004 and 2008 Electric EERS	3% cumulative savings by 2013	66 Pa C.S. § 2806.1; PUC Order Docket No. M-2008-2069887

[35] Connecticut does not currently have long-term energy efficiency savings goals that can be defined as an EERS. It is included in this report because it has very recent experience with an EERS policy.

[36] California's goals presented as gross savings. A rough estimate of California's goal as net savings can be achieved by converting gross savings to net savings using the 2009 net to gross conversion factor of 61% (CPUC 2011). Net goals are approximately 0.8% annual savings for the period 2010-2013, dropping to 0.55% from 2014-2020. California's evaluation and attribution methods are some of the strictest in the country, however, which partly explains the low net to gross conversion factor.

State Year Enacted Electric/Natural Gas Policy Type	Energy Efficiency Resource Standard	Reference
Arkansas 2010 Electric and Natural Gas EERS	Annual reduction of 0.25% of total electric kilowatt-hour (kWh) sales to 0.75% of total electric kWh sales over the next three years (slightly less for natural gas).	Order No. 17, Docket No. 08-144-U; Order No. 15, Docket No. 08-137-U
New Mexico 2008 Electric EERS	5% reduction from 2005 total retail electricity sales by 2014, and a 10% reduction by 2020	N.M. Stat. § 62-17-1 et seq.
Nevada 2005 and 2009 Electric RPS–EERS	5% Renewable energy by 2025—energy efficiency may meet a quarter of the standard in any given year, or 6.25% cumulative savings by 2025.	NRS 704.7801 et seq.
Hawaii[37] 2004 and 2009 Electric RPS–EERS and EERS	Renewable Portfolio Standards include 15% electrical energy savings through 2015. Starting in 2015 all electric utility savings will count towards Hawaii's Energy Efficiency Portfolio Standards (EEPS). EEPS long-term goal is 4,300 GWh reduction by 2030, or 30% of sales.	HRS §269-91, 92, 96
North Carolina 2007 Electric RPS–EEERS	Renewable Energy and Energy Efficiency Portfolio Standard (REPS). Investor-owned: 12.5% by 2021 and thereafter. Energy efficiency is capped at 25% of the 2012-2018 targets and at 40% of the 2021 target.	N.C. Gen. Stat. § 62-133.8 04 NCAC 11 R08-64, et seq.
Texas 1999 and 2007 Electric EERS	20% Incremental Load Growth in 2011 (equivalent to ~0.10% annual savings); 25% in 2012, 30% in 2013+	Senate Bill 7; House Bill 3693; Substantive Rule § 25.181
Florida 2009 Electric EERS	3.5% energy savings over 10 years.	Docket Nos. 080407-EG—080413-EG; Order No. PSC-09-0855-FOF-EG
Delaware Pending Electric and Natural Gas EERS	Electricity: 15% electricity cumulative savings by 2015 Natural Gas: 10% cumulative savings by 2015.	SB 106

[37] Although Hawaii does not currently have a mandated annual goal for energy efficiency, ACEEE estimates that the current 30% goal will result in 1.5% annual savings through utility programs.

APPENDIX B: ESTABLISHED SAVERS CASE STUDIES

California

Background

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

Investor-owned utilities (IOUs) administer energy efficiency programs with oversight by the California Public Utilities Commission (CPUC), which establishes key policies and guidelines, sets program goals, and approves spending levels. IOUs and third-party contractors implement the programs. A share of public benefits funding is designated to go to non-utility organizations to offer programs that supplement and complement IOU-operated programs.

California's publicly-owned utilities (POUs), such as large municipal utilities serving Los Angeles and Sacramento, voluntarily administer and provide programs to their customers. The CPUC does not have regulatory authority over the POUs. California's utilities fund some of their programs and initiatives through resource procurement budgets and recover their costs through rate cases brought before the CPUC. California's utilities also collect a Public Goods Charge (PGC) on customer utility bills to fund utility energy efficiency programs. Public Goods Charge is California's is a public benefits funding mechanism established in Assembly Bill 1890 in 1996. The PGC on electricity consumption is about 0.48 cents/kWh and covers energy efficiency, renewable energy and R&D. About 0.3 cents of this charge support energy efficiency programs. AB 995, which became law in 2000, extended the electric PGC through January 1, 2012. A natural gas PGC was created by AB 1002 in 1999. It funds cost-effective energy efficiency and other public purpose programs.

For the 2006-2008 efficiency program cycle, California's investor-owned utilities (IOUs) budgeted $2 billion for three years of efficiency programs and reported spending $316 million in 2006, $670 million in 2007, and $932 million in 2008. The POUs collectively spent $104 million on energy efficiency programs in 2008, a 65 percent increase from their 2007 reported expenditures. The Consortium for Energy Efficiency reports 2009 electric utility energy efficiency program budgets totaling $998.3 million and natural gas program budgets of $378.4 million.

On September 18, 2008, with support from the Governor's Office, the California Energy Commission, the California Air Resource Board, the state's utilities, local government, and other key stakeholders, the CPUC adopted the California Long-Term Energy Efficiency Strategic Plan. The Strategic Plan was designed to maximize achievement of cost-effective energy efficiency in California's electricity and natural gas sectors between 2009 and 2020, and beyond. The Plan included four Big Bold Energy Efficiency Strategies: 1) all new residential construction in California will be zero net energy by 2020, 2) all new commercial construction in California will be zero net energy by 2030, 3) the Heating Ventilation and Air Conditioning (HVAC) industry and market will be transformed to ensure that its energy performance is optimal for California's climate and 4) all eligible low−income customers will be given the opportunity to participate in low-income energy efficiency programs by 2020.

On September 24, 2009 the CPUC approved the 2010-2012 portfolios and budgets for the IOUs. Originally the companies filed 2009-2011 portfolios and budgets but due to factors including the adoption of the Strategic Plan and the need for significant revision to the original utility portfolio applications, the Commission delayed the commencement of the program cycle and adopted a bridge funding decision (D.08-10-027) to ensure that programs would continue through 2009. The electricity and natural gas savings goals and budgets for the 2010-2012 IOU portfolios are presented in Table 18.

Table 18: California Goals and Budgets for the 2010-2012 Program Cycle

	PG&E	SCE	SDG&E	SoCal	Total
2010-2012 Program Cycle Electricity Savings (GWh)	3,100	3,316	539	-	6,965
2010-2012 Program Cycle Natural Gas Savings (MMTh)	48.9	-	11.4	90	150.3
2010-2012 Budgets (millions)	$ 1,338	$ 1,228	$ 278	$ 285	$ 3,129

California's Energy Efficiency Resource Standard Policy

Following California's 2001 electricity crisis, the main state resource agencies worked together along with the state's utilities and other key stakeholders and developed the California Integrated Energy Policy Report that included energy savings goals for the state's IOUs. The CPUC formalized the goals in Decision 04-09-060 in September 2004[38]. The goals called for electricity use reductions in 2013 of 23 billion kWh and peak demand reductions of 4.9 million kW from programs operated over the 2004–2013 period. The natural gas goals were set at 67 MMTh per year by 2013. This decision called for the goals to be updated every three years.

In July 2008 (Decision 08-07-047), the CPUC established new targets for energy savings for the years 2012 through 2020 for its regulated utilities[39]. For the nine year period, the gross electricity savings goals were set at 16 billion kWh and over 4.5 million kW. Gross natural gas savings were set at 620 MMTh.

California's 2010-2012 Energy Efficiency Plan sets targets for its four major electric and gas utilities.[40] Over the three year period, the plan calls for electricity savings of almost 1,500 MW of peak savings and 7,000 GWh and natural gas savings of approximately 150 MMTh.

Funding and Policy Approaches to Achieve Increased Savings

A number of regulatory and state policies help the IOUs meet their energy savings goals.

California's Consistent Support for Energy Efficiency

California's consistent and long-term support of energy efficiency has provided an environment that has made it safe for the utilities to invest resources in energy efficiency. Over the last 30 years, the CPUC, the state utilities, state businesses, and other interested stakeholders have made energy efficiency an integral part of the state's energy and business infrastructure.

Energy Efficiency First

Energy efficiency is the first priority in California's loading order for energy resources. This was first acknowledged in California's 2003 Final Energy Action Plan I. Under Public Utilities Code Section 454.5(b)(9)(C), investor owned utilities are required to first meet their unmet resource needs through all available energy efficiency and demand reduction resources that are cost effective, reliable, and feasible.

Program and Budget Flexibility

Program and budget flexibility are important California regulatory policies that contribute to the utilities' success in meeting the energy efficiency savings goals. The utilities are permitted to move funding from

[38] http://www.aceee.org/sector/state-policy/california - _ftn1#_ftn1
[39] http://www.aceee.org/sector/state-policy/california - _ftn4#_ftn4
[40] http://www.aceee.org/sector/state-policy/california - _ftn8#_ftn8

unsuccessful programs to successful programs. The utilities agreed that it would be difficult to meet California's savings goals without this flexibility.

Decoupling

California initially implemented decoupling through the Supply Adjustment Mechanism (SAM) for gas utilities beginning in 1978 (Decision 88835). By 1982, similar mechanisms were in place for the three electric IOUs. As the gas industry restructured, gas utilities began to serve large customers under a straight fixed-variable rate design, which continues through today. The CPUC stopped the electric decoupling mechanisms in 1996 due to restructuring of the electric power industry.

In 2001, the Legislature passed Section 739.10, which required that the CPUC resume decoupling. Decoupling resumed for Pacific Gas & Electric, Southern California Edison, and San Diego Gas & Electric beginning with the 2004 revenue requirement. Currently, the revenue decoupling program is combined with performance incentives for meeting or exceeding energy efficiency targets. Revenue requirements are adjusted for customer growth, productivity, weather, and inflation on an annual basis with rate cases every three or four years, varying by utility.

Decoupling mechanisms have been developed and applied in individual cases with the IOU utilities. All of the investor-owned electric and gas utilities have decoupling. It is an important policy for California's "big, bold" energy efficiency initiative. There have been no specific evaluations performed of the decoupling mechanisms as of March 2010 (CA Code Sec. 9 Section 739(3) and Sec. 10 Section 739.10 as amended by A.B. XI 29; Decisions 98-03-063 & 07-09-043).

Shareholder Incentives

The CPUC defined a new Risk/Reward Mechanism for investor-owned utilities in the Energy Efficiency Proceeding (CPUC Rulemaking 06-04-010). Decision 07-9-043 (October 2007) established a minimum performance standard for the utilities under which incentive earnings accrued only if the IOU energy efficiency portfolio of programs achieved at least 85 percent of the CPUC's goals. The incentive formula called for utilities to receive 9% of net benefits if they achieved between 85-99% of savings goals, and 12% of net benefits if they met or exceeded savings goals up to the earnings caps established for each utility. Utilities can earn a percentage of their incentive earnings before evaluation procedures verify their impacts.

In addition to getting energy savings credit for traditional energy efficiency programs, the utilities get energy savings credit when higher state energy codes and standards go into effect. This encourages the utilities to fund programs that impact state codes and standards.

Administrative and Program Strategies to Achieve Sustained Energy Savings

Decision 09-09-047 (October 2009) gives an overview of the California utilities' 2010-2012 energy efficiency program portfolio. The portfolio incorporates program concepts developed as part of the California Long Term Energy Efficiency Strategic Plan.

Twelve statewide programs, and 44 statewide sub-programs are implemented consistently (in terms of program design / logic model, and incentive structure) across the four IOU service areas. The goal is to simplify program participation, reduce customer confusion, and reduce cost of administration and oversight. The IOUs share ideas about the programs and benefit from each other's experience. The 12 statewide programs include: Residential, Commercial, Industrial, Agricultural, New Construction, Lighting Market Transformation, Heating, Ventilation, and Air Conditioning (HVAC), Codes and Standards (C&S), Emerging Technologies, Workforce Education and Training (WET), Marketing Education and Outreach (ME&O), and Demand Side Management Coordination and Integration (IDSM).

In the 2010-2012 program cycle, for the residential sector, the IOUs are emphasizing whole house retrofits aimed at reducing the annual energy consumption by 20% through comprehensive retrofits. In

the commercial and government sector programs, the IOUs are placing more emphasis on benchmarking, the process of measuring performance by using a specific indicator, such as energy usage data, to compare a building to an industry standard, or comparable building. The commercial/industrial/agricultural programs are piloting "continuous energy improvement" (CEI) efforts. CEI provides comprehensive strategic energy planning and consulting services for large commercial and industrial customers.

For electricity savings, the number one end use is lighting. Lighting programs include some basic energy efficient lighting (compact fluorescents—CFLs) installations but the emphasis is on more advanced lighting solutions. It is uncertain whether this shift will result in higher savings since, in the short term, CFLs are the cheapest savings available. It is possible, however that focus on a more diversified offering of advanced lighting solutions will contribute towards the sustainability of savings from lighting in the future by priming the market for next new technology.

The IOUs make efforts to use the right channel to get to the customers. For example, for larger customers, the utilities rely on their account representatives who work with energy service companies, etc. that align the customers with measures and programs that are best for them. For residential and small business customers, the IOUs depend on retailers, contractors and manufacturers (trade allies) to help them promote energy efficient products and the utility programs. The utilities meet regularly with the account representatives, retailers, contractors and manufactures to share information about the programs and the customers.

The IOUs focus on getting the largest savings possible from each particular market. In order to do this, they learn as much as possible about each market—through market studies, their account representatives and field engineers. The idea is to create an energy package that works for the customer—using more of the customer's language and less energy efficiency jargon.

The IOUs leverage programs with other resources (government, trade allies), whenever possible. In general, the IOUs increased funding for industrial programs during the 2010-2012 cycle because of the available savings potential in that sector. For natural gas savings, the industrial sector is key.

Early Results, Responses, and Outlook

Program performance reports to-date for the California investor-owned utility programs are posted at http://eega.cpuc.ca.gov/. The utilities' evaluated net savings for the 2006-2008 program cycle fell short of the Commission's adopted goals. The utilities plan to make up for these shortfalls in the 2010-2012 program cycle.

The CPUC and the utilities are cautiously optimistic about the utilities meeting the 2010-2012 program savings goals. Saving goals for the California IOU plans must be met over the full 3-year cycle (not annually). It appears, however, that most of the IOUs met or were close to meeting estimated savings goals for 2010. It is likely that, with time, the programs will continue to improve. Also, the utilities can move funding around—from less successful to more successful programs, if necessary.

In April and May 2010, the CPUC held day-long "Knowledge Transfer" meetings with the IOUs and evaluators to discuss policy lessons learned from the 2006-2008 evaluations. These sessions discussed design changes, trade allies and more, with an eye toward making programmatic improvements that would increase the realized savings levels in the long term.

The CPUC and the IOUs are in the process of hammering out short term and long term Program Performance Metrics (PPMs) for each of the statewide program areas. PPMs will provide qualitative and quantitative means of tracking the programs' achievements at one-year and three-year intervals. This process has reinforced program design changes and collaborative planning efforts.

Prognosis

In general, the IOUs plan on continuing to do what they are doing: looking at the programs from a long-term perspective and continuing to build the necessary infrastructure to maintain the programs over time.

In California, the IOUs recognize that the programs must be well-planned and well-organized; the employees, contractors and trade allies must be knowledgeable and trained; and there needs to be a good evaluation process in place that provides feedback on how the programs can be improved.

As the California energy codes and standards improve, it is more difficult for the utilities to meet savings goals. (The current portfolios have benefit-cost ratios of approximately 1.1–1.2—uncomfortably close to 1.0). The utilities, however, with the support of the CPUC and other parties, continue to push forward. Examples of the utilities efforts to increase savings include:

1) funding emerging technologies (for example, SDG&E and SoCalGas are active participants in developing best practices natural gas programs at the Consortium of Energy Efficiency),
2) tracking implementation of audit recommendations over time—looking at what customers are installing and what they aren't installing to figure out what the utility can do to increase implementation of recommendations, and
3) focusing more on behavioral changes (for example, providing feedback mechanisms to the customers on energy consumption. The CPUC is working on how to evaluate these programs so the companies can get credit for them).

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Connecticut

Background

Connecticut utilities have provided energy efficiency programs for their customers since the 1980's. Today, Connecticut is a leader in utility energy efficiency. Electric and natural gas programs are required by statute. Through 2004, Connecticut electric utilities had reported cumulative annual savings of 2,651 GWh[1], the eleventh highest of all states, and the sixth highest as a percent of retail sales. In June 2005, the Connecticut legislature adopted legislation that added "Class III" requirements to the state's renewable portfolio standard (RPS), covering energy efficiency and combined heat and power plants (CHP). Natural gas efficiency programs were required in PA 05-1, An Act Concerning Energy Independence, passed during the June Special Session as House Bill No. 7501, July 21, 2005. Residential natural gas programs began in 2006 and commercial and industrial sector programs began in 2007.

Connecticut's electric distribution companies, natural gas investor-owned utilities, and municipal electric companies all provide portfolios of energy efficiency programs to their customers. Connecticut Light and Power Company (CL&P), owned by Northeast Utilities, is the largest electric distribution and transmission utility, with retail sales over 14,000 GWh annually. United Illuminating Company (UI) is the other major electric investor-owned utility, with retail sales of 3,000 GWh annually. There are three natural gas distribution utilities: Connecticut Natural Gas Corporation, Southern Connecticut Gas Company, and Yankee Gas Services Company.

Funding for utility electric energy efficiency programs reached almost $50 million in 1993, but then participated in the national trend downward to approximately $30 million per year in the late 1990's. Spending remained in the same range during the first few years after 2000, spiking up from $35 million in 2003 to $58 million in 2004.

The Energy Conservation Management Board (ECMB), appointed by the Department of Public Utility Control (DPUC), is responsible for overseeing the natural gas and electric distribution companies' planning. The ECMB administers the Connecticut Energy Efficiency Fund (CEEF), which is primarily supported by monthly charges on customers' bills. CEEF was created in 1999 to address increasing energy demand and rising costs. The utilities administer the energy efficiency programs. The utilities, with the contractors they hire, implement the programs.

Connecticut has had various types of utility performance incentives for demand side management since 1988. The exact mechanism has changed over time. Gas and electric revenues were not decoupled from sales volume prior to the energy efficiency resource standard policy going into effect.

Energy Efficiency Resource Standard Policy

In 2007, the Connecticut legislature enacted Public Act 07-242, An Act Concerning Electricity and Energy Efficiency, placing new energy efficiency requirements on utilities and establishing regulatory mechanisms, such as electric and natural gas decoupling, to support achievement of these goals. While natural gas efficiency is addressed in the statute, Connecticut does not have an EERS for gas.

The Act requires the electric distribution utilities to procure all cost-effective energy efficiency as their first-priority resource. The combination of complementary policies buttresses the savings requirements, making a very strong energy efficiency resource standard. Under the 2005 law Class III requirements, electricity suppliers must meet 1% of their demand through using efficiency and combined heat and power (CHP) by 2007 and 4% by 2010. The cumulative targets increase by 1% per year. Distribution utilities and other power distributors are responsible for meeting the goals. Existing energy efficiency programs (starting in 2006) may be used to help meet the goals. Third-party providers are also authorized to earn savings certificates and sell these to power providers that have Class III obligations. Under the legislation, certificate values can range between $0.01 and $0.031 per kWh of savings.

The 2007 Act strengthened these requirements through enacting complementary policies, including policies allowing energy savings from waste heat recovery to count toward savings goals. These policies support achievement of greater levels of energy efficiency in Connecticut. In its 2008 decision approving the combined 2009 Conservation and Load Management Plan submitted by the states' major utilities and the Energy Conservation Management Board, the DPUC ordered that the 2010 plan establish broader, longer-term goals in Docket 08-10-03. Connecticut utilities did not include long-term goals in the joint 2010 Plan, but goals for programs of 1.5% savings (of total sales) in 2009 and 2010.[41] The 2010 Conservation and Load Management Plan was approved, but the Department expressed concern that long-term goals were not adopted.[4] However, utilities are reluctant to include long-term goals without commitment from the DPUC to increase levels of funding necessary for aggressive long-term energy efficiency goals. The DPUC has shown no indication it will approve additional ratepayer funding for electric programs beyond the current statutorily-mandated ratepayer charge. Recent energy efficiency budget raids described below have fostered uncertainty that limits the utilties' desire to plan out energy efficiency over a long period of time.

Resource needs are first to be met through "all available energy efficiency resources that are cost-effective, reliable and feasible." The act requires electric distribution companies to review the state's energy and capacity resource assessment and develop a comprehensive plan for procurement of energy resources, considering a full array of supply and demand resources. The act requires resource selection and procurement to be done so as to minimize the costs and to maximize consumer benefits consistent with the state's environmental goals. The distribution companies must submit annual assessments of energy and capacity requirements for the next three, five and ten years, as well as plans to "eliminate growth in electric demand" and to achieve other demand-side and environmental objectives. The DPUC has interpreted this mandate with an emphasis on capacity needs, and has not approved funding increases to achieve all cost-effective energy efficiency. (Docket 10-02-07)

The distribution companies must submit biennial assessments of energy and capacity requirements looking forward three, five and ten years, as well as plans to "eliminate growth in electric demand" and to achieve other demand-side and environmental objectives. The Connecticut Energy Advisory Board (CEAB) reviews the plans before they are submitted to the Department of Public Utility Control (DPUC), along with CEAB comments and analysis. In a separate proceeding, the DPUC reviews the annual Conservation and Load Management Plan, which is developed by the utilities with oversight by the Energy Conservation Management Board (ECMB), which is appointed by the DPUC. The ECMB oversees the Connecticut Energy Efficiency Fund (CEEF), which is primarily supported by monthly charges on customers' bills. CEEF was created in 1998 to address increasing energy demand and rising costs. With oversight by the ECMB and its consultants, the utilities administer the energy efficiency programs.

Decoupling

The law requires the Department of Public Utility Control to order the state's electric and natural gas distribution companies to decouple distribution revenues from the volume of natural gas or electricity sales through one or more of three strategies: (1) a mechanism that adjusts actual distribution revenues to equal allowed distribution revenues, (2) rate design changes that increase the amount of revenue recovered through fixed distribution charges, and/or (3) a sales adjustment clause. Currently, United Illuminating uses a full decoupling mechanism, adjusted annually.

Shareholder Incentives

During annual hearings, the Energy Conservation Management Board (ECMB) reviews the past year's results relative to the established goals and determines a performance incentive for the distribution utilities for achieving or exceeding the goals. The incentive, referred to as a "management fee," can be from 1-8% of the program costs before taxes. The threshold for earning the minimum incentive (1%) is 70% of the goal. At 100% of the goal, the incentive would be 5%. At 130% of goals, it would be 8%. Anticipated incentives are built into the annual budgets (Docket 07-10-03)

[41] See Docket 09-10-03, Conservation and Load Management Plan.

Funding and Policy Approaches to Achieve Increased Savings

Within the new framework created by the Electricity and Energy Efficiency Act, including decoupling and incentive policies described above, spending increases have been a major factor enabling and sustaining the attainment of higher energy savings.

The utility energy efficiency programs have the infrastructure and capabilities in place to acquire all cost-effective savings, but now these funding increases have been stopped and in some cases reversed. Program plans—designed by the utilities to meet the explicit legal requirement for all cost effective energy savings—have been approved by ECMB, but funding increases have been blocked at the DPUC. At UI, the efficiency program budget is dropping.

One policy issue at the center of this is the application of cost effectiveness tests: in a state where statute requires the acquisition of "all cost effective energy efficiency," determining the measure makes all the difference. One utility representative described the debate over cost-effectiveness test as a tug-of-war. Using the Total Resource Cost cost effectiveness test indicates that the utility gas and electric programs are highly cost effective. The Commission uses electric system tests, which results in a lower benefit-cost ratio for the programs proposed by the utilities, and, in turn, indicates that fewer programs are needed to meet the standard of all cost-effective energy efficiency.

Overall state budget deficits work against established energy efficiency program funding. Public Act 10-179 will reallocate approximately $19 million from the Conservation and Load Management Fund in 2012 and $27 million annually from 2013 through 2018 to cut the state deficit. These developments reverse a significant upward trend in energy efficiency program investment in Connecticut shown in Table 19 below:

Table 19: Utility Energy Efficiency Funding

Electric	$35,231	$58,098	*NA*	$69,600	$95,716	$104,152	$73,446	$115,300	
Gas				$1,400	$2,600	$7,500	$9,400		$16,900
	2003	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**

Sources: Eldridge et al. 2006; Eldridge et al 2009; Molina et al. 2010; CEE.

Administrative and Program Strategies to Achieve Increased Energy Savings

Both CL&P and UI representatives emphasized the fuel-blind, integrated, and coordinated aspects of program delivery as critical to their success in delivering energy savings. Many efficiency contractors work with multiple utilities, both gas and electric, which reduces overhead costs and leverages the benefits of shared promotions and branding. At CL&P, only a few projects are electric-only or gas-only; both retrofit and new construction are fully integrated with natural gas utility programs. UI customers use a lot of oil, and how to integrate that is a big question for program managers and designers.

Connecticut's Department of Public Utility Control (DPUC) approved the 2010 joint Conservation and Load Management plan for the state's electric and natural gas utilities. The DPUC ordered a number of program changes, including expanding the rebate for high efficiency gas water heaters, creating a financing pilot program for natural gas customers, recalculating certain energy savings based upon updated buildings codes, and increasing training on code revisions. The full decisions are available on the DPUC's Web site.

More recently, the changes listed below to electric and natural gas efficiency programs, begun in 2009 and 2010, were expanded in the 2011-12 statewide Conservation and Load Management Plan submitted jointly by the utilities (CL&P et al. 2011). Program enhancements listed in the report include:

Residential:

- Low income programs were made a part of Home Energy Solutions (HES), enabling consolidated promotion.
- LED lighting has been kept on the table as a potential program offering with ENERGY STAR developing a specification in August 2010.
- A pilot for residential and small business customers providing energy savings reporting and feedback, started in September 2010, will be fully launched for electric in early 2011 and for natural gas later in 2011.
- Heat Pump Water Heaters will be offered through the Home Energy Solutions program.
- ENERGY STAR 2.5 and 3.0 requirements will be implemented in 2011 and 2012 respectively, resulting in deeper savings per home in the Residential New Construction Program.

Commercial and Industrial:

- Induction lighting and LED lighting technology installation will be encouraged by the addition of new incentives intended to stimulate markets and facilitate early replacement of less-efficiency lighting including T-12 fluorescents and High Intensity Discharge (HID).
- New low interest loans to support businesses that replace T-12's and HID systems.
- Changes to the Comprehensive Initiative to get business customers to implement both broader and deeper projects to capture more total savings.
- Shifts to control systems projects designed to get more significant savings within the Energy Opportunities program by aligning them with other parts of the program.

Technology

The primary technology category for energy savings continues to be lighting at both investor-owned utilities. At UI, they replaced T12 lamps with T8 lamps until those efficiency opportunities began to diminish, and then they moved toward relamping metal halide lights with T5 lamps, and now Super T8 lamps. They see the rolling improvement of efficient technologies as creating almost endless energy savings opportunities. With the evolution of program management and delivery, UI could meet savings goals with lighting alone. However, they are using it to raise project cost effectiveness for greater savings per project by packaging lighting with HVAC and other measures with lower benefit-cost ratios.

Sector Portfolio Allocation

The allocation of budget dollars has not changed drastically from 2007 to 2010: half of the money is goes to Commercial and Industrial sector programs, one third in Residential, and the rest to Administration, Planning and Education. There has been an increase in the Residential share from 34% to 39%.

Program Design

Bundling in lighting measures to get deeper savings per project is a program strategy the utilities are using in all sectors. For residential, they are using a whole house, fuel-blind approach, featuring instrument-guided weatherization, with gas and electric utilities collaborating under the Home Energy Solutions brand. This targets rebate dollars to where they can make the most difference saving energy. Connecticut electric utilities have shifted away from point-of-purchase rebates for appliances and now do upstream promotions for appliances and lighting.

CL&P offers an enhanced incentive package to commercial and industrial customers to facilitate deeper savings per project. They will pay business customers up to 40% of installed cost for some measures, and to encourage more measures per project they will pay up to 50% of the cost for the entire project. Similarly, for small businesses that implement refrigeration controls, lighting, and HVAC measures together, the overall project will provide a reasonable financial payback period. CL&P provides a financial bonus if they implement natural gas efficiency measures too.

Early Results, Responses, and Outlook

A major challenge to sustaining high levels of energy savings in Connecticut is inconsistent levels of funding. In 2009, electric efficiency program budgets dropped from $104 million to $73 million, while

savings dropped from 354 GWh to 237 GWh. Program administrators explained that unplanned shifts create customer confusion. Some projects are cancelled that had been planned with the expectation of getting funding. The impact for commercial and industrial customers is significant because they need longer project lead times. Even as the budgets rebounded in 2010, businesses face uncertainty about whether the money will be there. Utility program administrators need the flexibility to access funds from the next budget year to support programs that are succeeding beyond expectations—if that money is not there, some of the most effective areas energy savings may be dampened. Legislative and regulatory decisions to restrict and reduce efficiency funding are against the trend in the Northeast, where adjacent states are tripling electric efficiency budgets or more.

Another force working against utilities getting credit for the savings targets has been declining net-to-gross ratios. UI explained that independent program impact evaluation and research into free ridership has shown that realization rates and attribution have been going down. One possible explanation for this is that consumers have been exposed to energy efficiency messages from multiple sources, such as the Governor's advertising campaign, so it is more challenging to attribute all savings to the program activities.

Market Transformation

When asked about market transformation efforts, both IOU representatives spoke about the retail CFL market as their biggest focus. In 2007 and 2008 the number of CFLs sold took off when large retailers changed stocking practices. The perception was that the market had been transformed, but when the economy went into recession there was a drop-off in CFL sales. When efficiency program support of the level of CFL sales declined, sales volume also declined. The utilities have since reinstated their levels of support for CFLs so that they can count the energy savings from the number of lighting sockets. As appliance standards come into effect, utilities have seen a shift in the buying habits of consumers and increased recognition of the ENERGY STAR label. However, the utilities currently do not get any credit for energy savings achieved through appliance standards, so it does not help them hit their targets.

CL&P does get some savings attribution from a new pilot program, the Business Sustainability Challenge. CL&P holds classes and brings in companies to train them about sustainability and energy efficiency. One example is buying printers that use less paper and less energy. While some efficient hardware measures are installed, the emphasis is on changes in behavior. For large businesses, CL&P also works with approved contractors to provide the Process Reengineering for Increased Manufacturing Efficiency (PRIME) program for large industrial manufacturing customers. With funding provided by the Connecticut Energy Efficiency Fund (CEEF), the program provides training in lean manufacturing techniques, enabling businesses to reduce electrical energy use while cutting waste from their operations using a systems approach.

Prognosis

The largest variable for Connecticut is how much funding will go into programs. Funding hinges on political and regulatory policy choices, especially technical interpretations of cost-effectiveness.

The growth of behavior-based programs will be a much smaller factor. While behavioral programs will not make up a high percentage of savings over the next three years, one Connecticut utility efficiency manager explained that as the incremental benefits become smaller, each new generation of efficient technologies provides a smaller increment of energy savings. In this context, energy savings from behavioral programs become significant because they are relatively larger.

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Massachusetts

Background

Massachusetts is a leading state for utility energy efficiency programs with a successful implementation record spanning over 30 years and across all customer sectors. By 1993, electric utilities in Massachusetts had saved a cumulative annual 1,619 GWh. From 1996 to 2000, spending on electric energy efficiency programs increased steadily every year, from $72 million to $99 million. The state created an aggressive funding mechanism and required electric distribution companies to provide energy efficiency programs during its restructuring of the industry in 1997. The law governing these programs is Massachusetts General Law, Chapter 25 §19. Natural gas utilities in the state have offered energy efficiency programs to customers since the late 1980s. Prior to the implementation of the Green Communities Act, Massachusetts utilities spent $25.6 million on natural gas efficiency in 2007 saving 8 million therms; electric utilities spent $120 million that year.

The largest electric utilities are National Grid, NSTAR, and Western Massachusetts Electric Company, owned by Northeast Utilities. Major gas utilities include National Grid and Columbia Gas of Massachusetts. There are five electric energy efficiency program administrators and seven gas program administrators. More than 90% of all customers in the state are eligible to be served by these energy efficiency programs.

Massachusetts has a restructured utility industry with competitive generation and retail markets. The distribution companies remain regulated and are required to offer energy efficiency and other demand-side management programs. The distribution utilities administer their own energy efficiency programs with collaborative input and oversight from the state Department of Energy Resources (DOER) and Department of Public Utilities (DPU).

More specifically, DOER describes the program administration model as a two stage process, with the Massachusetts Energy Efficiency Advisory Council (MEEAC) at the center. MEEAC is an 11 member stakeholder body, chaired by DOER, that works collaboratively with the utilities to develop coordinated energy efficiency plans. Three-year plans are submitted to the Department of Public Utilities (DPU) for approval based on cost-effectiveness and the extent to which administrators use competitive procurement for energy efficiency products and services. DOER acts as the Chair to the Counsel and works to

oversee the programs on track to meet their energy savings goals. Administrators may modify their plans midyear or annually through a mid-term modifications process.

Massachusetts' Energy Efficiency Resource Standard Policy

The Green Communities Act of 2008 ushered in a new era for greatly expanded efficiency programs by establishing an "efficiency procurement" approach to EERS policies. That is, the Green Communities Act requires electric and natural gas distribution utilities to invest in all cost-effective energy efficiency that is cheaper than supply resources. Starting in the fall of 2009, and triennially thereafter, the distribution utilities are now required to propose a joint, comprehensive, fully funded state-wide 3-year efficiency plan (for 2010-2012) to satisfy the all cost-effective efficiency procurement requirement for input and review by a new diverse stakeholder efficiency council.

This new Massachusetts Energy Efficiency Advisory Council (EEAC) plays a central role in planning and overseeing the utilities' program administration. The EEAC is an 11 member stakeholder body, representing commercial, industrial, residential, low income, labor, and environmental interests, chaired by Massachusetts Department of Energy Resources (DOER), which works collaboratively with the utilities to develop state-wide coordinated energy efficiency plans. After EEAC review and approval, plans are submitted to the Department of Public Utilities (DPU) for analysis and cost-effectiveness testing. The EEAC and DOER help to keep programs on track to meet their energy savings goals. Plans are updated annually and may be modified mid-term. There are five electric energy efficiency program administrators and seven gas program administrators, whose work is overseen by the EEAC and approved by the DPU.

The Green Communities Act requires that electric and gas utilities procure all cost-effective energy efficiency before more expense supply resources, requiring a three year planning cycle. On January 28th, 2010 the DPU approved the first 3-year (2010-2012) electric and gas energy efficiency plans under the Green Communities Act, paving the way for the realization of the goals and efficiency procurement requirement established in the Act. The electric efficiency procurement plan is fully funded and ramps up savings each year, from a starting point of 1.0% in 2009, to 1.4% in 2010, 2.0% in 2011, and then to 2.4% of retail electricity sales in 2012. 2.4% is equivalent to a first year savings of 1,103 GWh in 2012. The energy efficiency investments in 2010-2102 will save 2,625 gigawatt-hours (GWh) of electricity in 2012 (the cumulative annual impact in 2012). The statewide totals are comprised entirely of the individual program administrator savings.[42]

The rate of increase, level, and duration of annual savings place Massachusetts standard as one of the most if not the most ambitious EERSs of any state. With annual electricity savings of 2.4 percent per year going forward from 2012, the Massachusetts programs would achieve cumulative annual energy savings equivalent to 30 percent of retail electricity sales in 2020. Customers will use 23.4% less electricity in 2020 than they were forecasted to use (based on the April 2009 revised ISO-NE CELT forecast). Retail energy use in 2020 will be 12.5% less than what customers used in 2009, thereby reducing customer energy use over the next 11 years. (In visual terms, this will bend the curve of projected demand down.)

The natural gas plan will save 24.7 million therms in 2012, equivalent to 1.15 percent of retail natural gas sales in 2012. The energy efficiency investments in 2010-2102 will save over 57.3 million therms of natural gas in 2012 (the cumulative annual impact in 2012). The lifetime energy savings for the gas three-year plan will be almost 897 million therms.

Each efficiency program must be cost effective with a benefit cost ratio greater than one on both a program and sector basis. While rare, it is possible that an efficiency measure could be part of an approved program and fail to meet the test. Cost effectiveness is measured using a version of the Total Resource Cost (TRC)Every year a annual report is filed with the DPU on annual savings and evaluation findings. Every two years the DPU requires that administrators provide an updated avoided energy supply component study, in which avoided costs are updated through a collaborative study funded for the entire New England region.

[42] D.P.U. Order on Electric Three-Year Energy Efficiency Plans, 2010-2012 (D.P.U. 09-116 through D.P.U 09-120)

Funding and Policy Approaches to Achieve Increased Savings

A major input required to make steep increases in energy savings attainable and sustainable will be unprecedented funding increases. According to the State of Massachusetts Department of Energy Resources (DOER), electric utilities budgeted $183.8 million for 2009 electric energy efficiency programs from ratepayer-funded sources, a 46 percent increase over 2008 spending. Sources of funding include the System Benefits Charge on customer bills, an adjusting charge approved by DPU, revenues from the ISO New England (ISONE) Forward Capacity Market, and proceeds from the Regional Greenhouse Gas Initiate (RGGI). The Green Communities Act dedicates 80% of RGGI funds to energy efficiency.

For the 2010-12 electric joint energy efficiency plan, the allocation of funding among sectors remained constant from year to year: 72% for commercial and industrial, 24% for residential, and 4% for low-income.

Decoupling

Massachusetts is currently implementing decoupling for all of its gas and electric utilities pursuant to DPU Docket 07-50-A (July 2008). Gas and electric utilities must now include decoupling proposals as a component of their rate cases. Target revenues are determined on a utility-wide basis, and can be adjusted for inflation or capital spending requirements if necessary. The Massachusetts DPU has approved decoupling plans for National Grid Electric Company (DPU 09-39), Bay State Gas Company (DPU 09-30), National Grid Gas Company (DPU 10-55) and Western Massachusetts Electric Company (DPU 10-70).

Shareholder Incentives

A shareholder incentive currently provides an opportunity for investor-owned utilities, who administer the efficiency programs, to earn up to 5.5% of program costs as an incentive for meeting program goals. The incentive is based on a combination of elements including energy savings, net benefits, and metrics that measure market transformation. The order that approved the incentive is DPU 08-50. The electric and gas utilities have negotiated statewide incentive dollars with the MEEAC. Those funds are allocated to each utility based on goals for dollar value of benefits and of net benefits. This common incentive mechanism is applicable to all of the utilities.

Administrative and Program Strategies to Achieve Increased Energy Savings

To stay on track to get the increased energy savings, Massachusetts recognizes the importance of piloting new programs, services, and delivery mechanisms to achieve the state's ambitious energy efficiency objectives. EEAC has been advocating for this more experimental and innovative approach to environmental, consumer and other stakeholder groups, emphasizing the importance of looking beyond the three year planning cycle and that in the short run not every new program effort will succeed, and that it should be acceptable for some initiatives to fail.

EEAC's overall approach to saving more energy is to "go deeper, then broader": to reduce the creation of lost efficiency opportunities and implementation costs per project by designing programs to capture a greater share of potential savings on each project first, and then to expand participation. In practice, they are doing both simultaneously because reaching the goals over short and the long term will require it.

Massachusetts efficiency leaders in the legislature and agencies including DOER recognized that to reach such aggressive energy savings goals, they would need to take an approach through the EEAC working with the utilities that would be flexible, action-oriented, learning, and adapting. The three-year planning horizon gives everyone involved more certainty about what they are doing. For example, program administrators may need to hire new staff. With a 30-year record of running very effective programs in Massachusetts that have been planned, evaluated, and refined every year, they have been able to create a structure that will obtain and sustain high energy savings. Key elements in the portfolio design are:

1) Expand the existing programs,
2) Integrate electric and gas programs,
3) Remove the funding cap and invest all the resources necessary, and
4) Each customer sector gets the money they pay in for Commercial and Industrial, Residential, and Low Income.

Some individual programs and pilots that have been added include: behavior-based programs, ENERGY STAR televisions, Deep Energy Retrofit, and the Office of the Future in the Commercial sector. All of these are within the rubric of MEEAC's priority of deeper savings per customer before aiming for broader participation. Moreover, DOER has included overarching initiatives, such as US DOE funded building labeling pilot, and the US DOE Save Energy Now industrial program to help in the promotion of energy efficiency improvements.

The relative allocation of spending and savings to each sector and program correspond very closely to the joint three-year plans. There is a standard set of cost-effective measures for all sectors. CFLs are discounted at the wholesale level in Massachusetts, so customers do not need a coupon or get a rebate at point of purchase.

At the request of DOER, the program administrators hired an evaluation consultant to study the amounts of rebates for various measures compared with other states and found that Massachusetts utility efficiency rebates were in the middle of the measured ranges. For residential, 75% of the cost of efficiency measures is available as rebates, up to a limit of $2000. Commercial rebates are often custom, but are in a similar range. For low income customers, who than earn 60% of the median income, energy efficiency is free.

Early Results, Responses, and Outlook

According to the fourth quarter report from the Massachusetts Program Administrators in 2010, the state is on track to meet its 2010 electric and natural gas requirements. The preliminary data shows PA's meeting 98% of their MWh goals, 103% of their Therms goals, and spending less than the allotted budget on electric and natural gas programs.[43]

Table 20: Massachusetts Electric Savings Targets and Savings Achieved, 2010-2012

Year	Savings Target as Percent of Sales	Savings Goal (MWh)	Electric Savings Achieved (MWh)	Percent of Target Achieved
2010	1.4%	625,004	609,788	98%
2011	2.0%	897,232		
2012	2.4%	1,103,423		
2010-2012	**5.8%**	**2,625,083**		

Note: Data is preliminary and subject to revision and check.
Source: Quarterly Report of the Program Administrators, Fourth Quarter, 2010. February 3, 2011.

[43] A report with verified savings will be issued in mid- to late-2011.

Table 21: Massachusetts Natural Gas Savings Targets and Savings Achieved, 2010-2012

Year	Savings Target as Percent of Sales	Savings Goal (Therms)	Natural Gas Savings Achieved (Therms)	Percent of Target Achieved
2010	0.63%	13,586,666	13,926,865	103%
2011	0.89%	19,087,301		
2012	1.15%	24,687,219		
2010-2012	**2.67%**	**56,368,432**		

Note: Data is preliminary and subject to revision and check.
Source: Quarterly Report of the Program Administrators, Fourth Quarter, 2010. February 3, 2011.

The utility program administrators are implementing the strategic principle of accessing deeper savings first with statewide coordination and the active involvement of DOER. Deeper savings begins with planning for increased budgets for rebates and other financial incentives combined with increased one-on-one customer contact. For businesses, program administrators have dedicated account executives. They also bring in outside consultants to help with O&M and retrocommissioning projects. Residential customers get in-person meetings on how they can obtain program benefits.

Two of the areas that have posed a challenge to designing efficiency portfolios that will deliver the increased cost-effective energy savings were described. The first is a split-incentive problem for rental properties. In one to four family residential rental properties it is difficult for program managers to get the landlords interested in energy efficiency projects. The same pattern is evident with tenant businesses. Second, the Green Communities Act is not singularly focused on energy savings as its only purpose. Another area of the law is job creation. Interest groups such as labor unions and small independent contractors are very vocal on this issue. How to comply with the intentions of the policy impacts how to design programs to achieve savings goals.

Summarizing the factors contributing to EERS success through November 2010 in Massachusetts, one DOER representative identified four:

1. Leadership
2. Long term perspective
3. Transparency and stakeholder participation. "We made the critics a part of the process and made them see the benefits for their constituencies."
4. Innovations to address the challenges involved in the customer experience, such as customer bringing contractors into their homes.

Prognosis

The second triennial planning cycle will be beginning with annual savings requirements having increased to 2.4% for electric and 1.15% for natural gas. Efforts to expand existing programs in the first and second year have been tremendous. Respondents observed that it is not clear how program portfolios will exceed 2.4% savings. (Smaller states are planning on it. Vermont has done it; Rhode Island's statewide electricity savings goal will be even higher, at 2.5% per year.) In Massachusetts, one very significant factor to reaching 2.4% and sustaining that level of performance will be to attract additional sources of financing and to maintain greater total funding. Program Administrators will be looking to private investors, possibly federal carbon revenue, and to bring in banks and local credit unions to expand lending for energy efficiency at zero interest or very low interest.

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Minnesota

Background

Minnesota has a long record of customer energy efficiency programs offered by both investor-owned and publicly-owned utilities. These programs have achieved significant energy savings for well over two decades, without any of the interruption or upheavals that occurred in most other states that restructured their electric utility industries. Prior to the Next Generation Energy Act going into effect fully in 2010, Minnesota utilities were required to spend a percentage of gross operating revenue (0.5% gas, 1.5% electric and 2.0 % for electrics with nuclear power) on energy efficiency programs rather than to achieve a set amount of energy savings.

Regulated electric utilities are required to file integrated resource plans with the Public Utilities Commission (PUC). The plans identify the potential resources the utilities intend to use to meet consumer energy and demand in future years, including significant energy efficiency and conservation savings.

The program administration model centers on the Conservation Improvement Program (CIP).). CIPs are utility-administered programs with regulatory oversight by the Division of Energy Resources (DER), a state agency housed in the Minnesota Department of Commerce and serving as the state energy office. It was formerly known as the Office of Energy Security. Each gas and electric utility proposes their own CIP, which is reviewed and approved by DER. CIPs have been the main vehicle for efficiency efforts in Minnesota since the 1990's. Goals of the CIP system are to promote use of efficiency technologies, reduce energy costs, defer utility capital investments, and reduce pollution and conserve resources. Until recently, most utility efficiency programs were designed to provide rebates and other financial incentives for customers to buy energy-efficient products instead of standard efficiency products.

The largest investor-owned electric utilities are Xcel Energy, operating as Northern States Power; Minnesota Power Company; and Ottertail Power. Xcel has almost half the MWh retail sales in the state, more than three times as much as Minnesota Power Co., and more than the combined sales of the state's 170-plus public- and cooperatively-owned electric utilities. The largest generation and transmission cooperative, Great River Energy, serves 645,000 people through its 28 distribution co-op members. The largest natural gas utilities in Minnesota are CenterPoint Energy, Xcel Energy, and Minnesota Energy Resources Corporation. Together they comprise about 90% of the natural gas consumption in the state.

Nonprofit organizations have contributed to the development and success of energy efficiency programs in collaboration with the state and utilities. The Center for Energy and Environment, for example, has been involved with advocacy, and has provided technical engineering and finance research, assistance and services since 1979.

The DER reported in 2009 that the investor-owned utilities overall had achieved energy savings of 1.0 percent and 0.5 percent, electric and natural gas respectively, of 2007-2008 retail sales. Over those two years, OES reported that the utilities spent a total of $230 million, which yielded savings of more than 1 million MWh of electricity and 3.5 million MCF of natural gas. Funding is provided via tracker accounting , allowing utilities to recover their costs, which are trued-up annually or in the course of a rate case proceeding. . The $111.2 million electric budget for 2009 eclipsed previous years' utility energy efficiency program spending, which had not exceeded $56 million in any year from 1993 to 2006. While some of the smaller electric utilities had saved over 1.5% of retail energy sales on average from 2004 to 2008, Xcel Energy averaged 0.9% during the same period. This is significant because Xcel has over 80% of the

annual sales of the investor-owned utilities. Statewide, the total electric savings attributed to utility energy efficiency programs in 2008 was 540,805 MWh, 0.79% of sales.

Decoupling
The Public Utilities Commission (PUC) is authorized by state statute to approve one or more rate-regulated utilities' proposals for rate-decoupling pilots of up to 3 years. In June 2009, the PUC issued an Order adopting criteria and standards for pilot proposals for revenue decoupling (Docket No. E,G-999/CI-08-132, Issue date June 19, 2009). All utilities planned to file non-binding notices of intent about their plans for filing decoupling pilots by June 1, 2010; filings for pilot proposals are due by December 30, 2011. CenterPoint Energy has an approved natural gas decoupling pilot along with inverted block rates on the distribution side, which began in January 2011.

Shareholder Incentives
Utilities may earn performance incentives for energy savings, set such that at 1.5% of retail sales, electric utilities will earn an incentive of $0.09 per kWh saved while gas utilities will earn between $4.50 to $6.50 per thousand cubic feet saved (except for decoupled utilities who are capped at $3/MCF saved). The threshold level of savings is set at the lower of 50% of the utility's average achievements from 2004-2008 or at 0.4% of retail sales. The percentage of net benefits to be awarded to each utility at different energy savings levels is set at the beginning of each year based on approved goals.

Minnesota's Energy Efficiency Resource Standard Policy

All utilities in the state are subject to the energy savings requirements of the Next Generation Energy Act (NGEA), passed by the Minnesota Legislature in 2007 (Minnesota Statutes 2008 § 216B.241). Among its provisions, the Act set energy-saving goals for utilities of 1.5% of retail sales each year, commencing with the first triennial plan period that began January 1, 2010. Of the 1.5%, the first 1% must be met with direct energy efficiency energy savings, or conservation improvements. This may include savings from efficiency measures installed at a utility's own facilities. Up to 0.5% may be met by efficiency enhancements to each utility's generation, transmission, and distribution infrastructure. The Act originally provided that utilities may apply to the Public Utilities Commission for reduced goals, but that they may not be reduced below 1%. In 2009, the state legislature amended the Act to reduce the level of savings during the first three years for natural gas utilities, establishing an in interim average annual savings goal of 0.75 percent over 2010-2012 (Minnesota Session Laws 2009, Ch. 110, Sec. 32).

The statute does not mandate that all the savings come from conservation improvement plans and traditional rebate-based programs. Statute 216B.2401 states:

> It is the energy policy of the state of Minnesota to achieve annual energy savings equal to 1.5 percent of annual retail energy sales of electricity and natural gas directly through energy conservation improvement programs and rate design, and indirectly through energy codes and appliance standards, programs designed to transform the market or change consumer behavior, energy savings resulting from efficiency improvements to the utility infrastructure and system, and other efforts to promote energy efficiency and energy conservation.

It is the responsibility of the utilities and retail suppliers to meet their own goals, which are currently the only means of meeting the statewide goals. There are no savings from government agencies, codes or standards in addition that contribute to meeting the statewide goal at this time.

For the largest investor-owned utilities during the first triennial period, CenterPoint Energy's natural gas energy efficiency plan is to increase savings from 0.73 to 0.78%, averaging the minimum 0.75%. Xcel Energy electric savings goals included in their approved triennial plan are 1.15% in 2010, 1.2% in 2011, and 1.3% in 2012.

The Societal Cost Test is the measure of cost-effectiveness that is predominantly used, although results from four types of cost effectiveness tests are included in proposed program plans. The assessment of cost effectiveness is very important to the entire EERS and CIP system.

Funding and Policy Approaches to Achieve Increased Savings

All experts interviewed agreed that it will be a serious challenge for Minnesota overall to achieve the energy savings required after 2010.

Electric
The NGEA policy allows for utilities to count supply-side savings above the first 1.0% in order to reach the 1.5% target. Some supply-side efforts utilities are undertaking include enhancements to the efficiency of distribution lines, feeders, transformers, and transmission lines.

To sustain and increase energy savings necessitated increased funding levels. The $111.2 million statewide budget for electric efficiency programs in 2009 eclipsed 2008 levels by $51.2 million. Spending levels will continue to rise as goals ramp-up and programs attempt to reach new sectors and achieve deeper levels of savings. Overall CIP spending by investor-owned utilities was projected to increase from $77 million in 2008 to $127 million in 2010, an increase of 65 percent. Xcel Energy's Minnesota subsidiary Northern States Power proposed 2010-12 combined gas and electric plan includes a budget of over $281 million and electric energy savings of 1,121 GWh. The proposed electric efficiency and demand annual budgets increase from $75 million in 2010 to 84 million in 2012.

Natural Gas
CenterPoint Energy spent approximately $16 million on efficiency programs in 2010, more than double the pre-EERS 2009 expenditures. Their initial 2010-2012 Triennial Conservation Improvement Program Filing from June 2009 budgeted for increases for both in 2011 and 2012, with only slight decreases in energy saved per dollar budgeted in spite of a 30% decline in savings per participant. The gap is made up by sharp year-over-year increases in program participants, from 104,000 planned in 2010, up by approximately 80% to 187,000 in 2012. Xcel's approved budget for natural gas efficiency programs was $13.9 million.

Significant barriers to extend and maintain natural gas savings into the future include the limited number of technologies in the residential sector, the fact that homes are already very efficient due to a cold climate that makes insulation the norm, and limited efficiency potential in many industries due to past program successes. For example, for turkey processors, there is one measure to install and the businesses have installed it already. Not all of the savings achieved are credited to utility programs to count toward savings goals. While CenterPoint Energy has increased the number of furnace rebates from 10,000 to 18,000 in one year, and many of the furnaces replaced were older, less efficient models, only the savings above code are attributed to the program. The furnace might have gone from 80 to 94 percent efficiency, but if code is 90%, most of the savings are not being counted toward the savings goal.

The three largest natural gas utilities hired Navigant Consulting to conduct a market potential study to assess these challenges to meet the energy savings goals of the NGEA. Results indicated that while there were energy efficiency opportunities to be had, at higher levels of savings the incremental costs climb. Based on the potential study findings, in 2009 the state legislature changed the law to reduce the savings goals for the 2010-2012 CIP triennial planning period. For CenterPoint Energy, the savings goals was reduced from 1.0% to .75%.

Administrative and Program Strategies to Achieve Increased Energy Savings

Electric
Examples of efforts underway to maintain and increase demand-side energy savings beginning in the current triennium include:

1. Increased rebates across all sectors and enhanced financial incentives to increase program participation.

2. One-stop services for residential customers to make participation easier and more accessible and therefore to increase participation. These initiatives to achieve savings in the residential sector, where the transaction cost per house is high, aim to get high-volume participation and savings for electric and natural gas through the "Home Energy Squad" brand. The largest investor-owned utilities are working with the Minnesota Center for Energy and Environment (MNCEE) Community Energy Services to use social marketing and direct installation of low-cost measures toward this end. The goal is to reach 50,000 households per year; in 2010, 6,000 households have participated.

3. The Trillion BTU program, run by the St. Paul Port Authority, brings funding from the Federal economic stimulus, the Minnesota Department of Commerce OES, and Xcel Energy in to improve overall efficiency, including energy efficiency. One trillion BTU's is just under 300,000 MWh. An explicit goal of the program is to help utilities achieve some of their savings goals under the NGEA of 2007. The funding sources are leveraged through a business loan program. The businesses agree to energy audits paid for by Xcel Energy Co.; engineering studies are performed on at the firms' facilities; 25% of the cost is paid by the business and 75% paid by Xcel. Installation of necessary physical improvements will be covered by a Port Authority Loan and an Xcel Energy Rebate.

4. Early pilot programs such as billing comparisons and expanding emphasis on behavioral program approaches. The contractor implementing the pilots is OPower. OPower sends energy use reports by mail and email to homeowners, comparing the homeowners' energy use with their neighbors and suggests energy savings ideas. This use of "normative messaging" has the benefit of engaging large numbers of people and motivating them to take action, boasting higher participation rates

Xcel Energy is going after increased savings in the industrial sector and working with top management on long-term energy saving investments. Historically, Xcel has emphasized business efficiency far more than residential. They see the biggest opportunities with large industrial customers over the long run. 70% of Xcel's retail electric sales are to commercial and industrial customers. New business sector programs added in Xcel's 2010-12 plan filing include: Turn-Key Services, Data Center Efficiency and Energy Advisory Service.

Xcel's short term plans start with increasing rebates. Most of their energy efficiency programs in Minnesota will offer a higher contribution to the customer's incremental cost of each efficiency measure, although they do not foresee this being a sustainable long term strategy by itself. They will put development effort into improving existing programs, leveraging holistic program success, and strengthening mid-market sales channels. Additional residential programs proposed in Xcel's plan filing include: Conservation Kits for Low Income customers, Energy Efficiency Support Services, Home Insulation Rebates, Refrigerator Recycling, Residential Quick Fix Service and School Education Kits.

Natural Gas

CenterPoint Energy, Xcel Energy, and Alliant each filed petitions to modify their previously-approved Natural Gas Conservation Improvement Programs in 2010. Alliant was granted approval to offer a rebate option for its Shared Savings program for the purpose of increasing participation; Xcel got permission to reduce the minimum qualifying efficiency of gas water heaters due to the lack of market availability.

Growth in savings in the near term at CenterPoint Energy—who serves two-thirds of the natural gas customers in the state—will come from the residential programs, with rebate programs for faucet aerators, low flow showerheads, furnaces, and water heaters. A CenterPoint Energy representative stated that all of the growth in next 3 to 4 years is expected to come from the residential sector, and this growth will cost more per therm of saved energy. Four new programs were added in 2010: insulation, air sealing, pilotless hearth rebates, and three tiers of furnaces (Kline).

The business side faces limitations. The industrial natural gas efficiency sector in CenterPoint's service territory is increasingly saturated and the number of marginally cost-effective efficiency opportunities is

declining. One approach to increasing participation has been to increase commercial market segmentation, focusing on K through 12 education, health care, multi-family housing, higher education, and restaurants. While food service was an important part of the portfolio, it is a diffuse area, similar to single family residential in that the total savings per project are relatively low and administrative costs relatively high.

Previously, the 2007-9 plan that was approved included no new incremental technologies, only increases in participation.

Early Results, Responses, and Outlook

Minnesota electric utilities have been increasing their savings each year, as show below in Table 22

Table 22: Minnesota Statewide Electric Savings Achieved 2007-2009

Year	Statewide Electric Savings Achieved (MWh)	Savings as % of 2007 sales
2007	463,999	0.68%
2008	600,179	0.88%
2009	649,379	0.95%

Source: Annual Legislative Report on GHG Reductions, January 2011

Several hurdles remain for utility energy efficiency programs to meet their savings goals into the future, most of which are policy-driven, although they all have implications for program administration, design, and implementation.

The Minnesota Division of Energy Resources has contracted with the Minnesota Environmental Initiative (MEI) to lead a multi-stakeholder process to find ways to achieve the 1.5% goal. They are focusing specifically on four "policy barrier issue areas": behavioral programs, low income, codes and standards, and utility infrastructure improvements noted above in this report. The "1.5% Energy Efficiency Solutions Project" has convened technical working groups on each of the four main issues to develop proposed solutions. The Project concluded on schedule in February 2011, issuing a self-titled final report with their findings.[44]

On the demand side, the impact of higher appliance standards and building codes on utility savings and how this will be addressed will be important considerations. MEI described the problem like this:

> … passage of more stringent codes and standards can have a negative impact on utility programs. As codes change the baseline conditions for energy efficient equipment that exceeds the code minimum is adjusted, which can reduce a utility's ability to claim savings and reduce the cost effectiveness of program portfolios.

In short, higher baselines mean lower savings attributable to utility efficiency programs. The technical working group on codes and standards has been looking at that this from multiple perspectives. They are investigating how quickly new baselines would be applied, methodologies (for the state as well as utilities) to track savings resulting from implementation of new codes and standards, and developing the business-as-usual scenario for code implementation. The recommendation is that the baseline be the codes that were in effect in 2007 at the time of NGEA enactment. Utilities may have a role to play in the implementation of codes and standards, possibly operating a code-compliance program within its service territory, and getting credit for some of the resulting energy savings.

The NGEA policy requirement measures annual "first year" savings, not cumulative energy savings, which constrains which efficiency opportunities utilities may use. Measures with lives of 12 to 15 years result in greater energy savings than, for example, behavioral programs with a one year measure life. So, while

[44] 1.5 Percent Energy Efficiency Solutions Project: Final Report. Minnesota Environmental Initiative. March 2011.

the incentive structure encourages utilities to pursue expanded and additional behavioral programs, the actual cumulative energy resource savings in future years will be less than if measures with more-persistent savings had been adopted.

Xcel Energy describes their future efficiency program success as dependent on many factors, including the growth of their existing program portfolio, emerging energy efficient equipment technologies, the development of methodologies to quantify savings from nontraditional programs and market transformation. Two key energy savings areas Xcel is looking at that fit squarely with the 1.5% Energy Efficiency Solutions Project are behavioral programs and codes and standards.

Prognosis

Xcel Energy will strive to meet the electric 1.5% goal over the long term, possibly during the next triennial planning period from 2013 to 2015. Current findings of achievable potential do not support saving 1.5% per year beyond 2015 using traditional programs and current technologies, even with up to 75% rebate levels. Long-standing, leading energy efficiency programs have captured much of the most cost-effective energy savings. Xcel will be looking to a new electric efficiency potential study in 2011 to identify additional efficiency opportunities. Over the long run, their strategic planning and modeling will consider current trends in existing programs as well as expected changes in lighting standards, motor standards, and possible changes to cooling and new construction codes.

For CenterPoint Energy's Minnesota natural gas operations, one representative conceded that the goal of 1% annual savings might not be reached until 2015.

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New York

Background

Second only to California in total spending on utility energy efficiency programs, New York has arguably one of the most extensive and complex utility energy-efficiency infrastructures of any state. The overall effort is designed to support a broad spectrum of activities including technology research and development, business and market support, and expansion of market opportunities for energy efficiency products and services. New York's energy efficiency program spending was almost double the "third place" state every year from 2006 to 2009. New York was one of the first states to establish a system

benefits charge (SBC) to support energy efficiency and other public benefits energy programs. The current and more recent generations of programs are required by regulatory orders issued by the New York Public Service Commission (NYPSC) and are the result of NYPSC cases dating back to 1996. The state, and the New York Power Authority (NYPA) in particular, have played pioneering roles in energy efficiency since the 1970's, including staples such as on-bill financing, whole building systems, and energy management systems. In the 1980's, NYPA ceased providing rebates and direct financial incentives for energy efficiency projects entirely and since then has lent investment capital, partnering with utilities' programs.

One of New York's longest running energy efficiency programs is New York Energy $mart^{sm}, initiated by the NYPSC for the 13-year period from 1998 to 2011. The program is administered by the New York State Energy Research and Development Authority (NYSERDA) and was designed as a market transformation effort, while simultaneously supporting resource acquisition. The current NYSERDA five-year funding cycle of SBC programs, known as "SBC III," ends in June 2011.

While NYSERDA has been the largest energy efficiency program administrator since the 1990's, there are three additional major energy efficiency institutions in New York State, each with their own functions and roles. NYPA, the largest state public power organization in the U.S., operates more than a dozen generation facilities, primarily hydroelectric plants, as well as over 1,400 miles of transmission lines. NYPA provides financing for energy efficiency investments and low-cost power for economic development, as well as supplying electricity to distribution utilities and cooperatives. Long Island Power Authority (LIPA), while also a state agency with substantial transmission and distribution assets, is structured as a non-profit municipal electricity provider. LIPA does not own any generation plants on Long Island.

In the fourth category are the investor-owned utilities. The largest of these are Consolidated Edison in New York City and National Grid upstate, through its operating company, the Niagara Mohawk Power Corporation. Historically, since the initiation of large-scale energy efficiency program efforts at NYSERDA, the utilities had not had major energy efficiency programs of their own. That changed recently when. the PSC issued an order to create the state energy efficiency portfolio standard (EEPS) in 2008.

From 2006 to 2008, ratepayer funding through the SBC for electric energy efficiency programs was relatively steady in the range of $220 to $240 million per year. Natural gas funding was $50 million in 2008.

Decoupling

Following an April 2007 order (Cases 03-E-0640 and 06-G-0746), electric and gas utilities must file proposals for true-up based decoupling mechanisms in ongoing and new rate cases. A revenue-per-class decoupling mechanism has been approved for both Consolidated Edison and Orange & Rockland electric utilities. True-ups occur annually under these mechanisms. Con Ed's revenue-per-customer gas decoupling program received approval to continue from the Department of Public Service (Case 06-G-1332, May 19, 2009). National Fuel Distribution also implements revenue-per-customer decoupling.

Shareholder Incentives

On August 22, 2008, the PSC established incentives for utility energy efficiency programs (Case 07-M-0548). The maximum potential incentives will be determined by the percentage of estimated overall program costs. The metric for utility performance is achieved megawatt-hour reductions. A unique trait of this incentive mechanism is the infusion of the risks of negative adjustments for utilities that achieve less than 70% of its efficiency target. Utilities achieving more than 80% of their targets receive incentives. On achieving 100% of its target, a utility is rewarded the maximum incentive.

New York's Energy Efficiency Portfolio Standard Policy

On June 23, 2008, the NYPSC issued a decision creating the New York Energy Efficiency Portfolio Standard (EEPS), part of a statewide program to reduce electricity usage by 15% of forecast levels by 2015, with slightly lower goals for natural gas savings. The Commission set interim energy savings goals and approved funding through the year 2011. The State's utilities were mandated to file proposed energy efficiency programs, and NYSERDA was invited to submit energy efficiency program proposals for approval. The savings targets began in 2008 at 0.5% savings relative to 2007 forecast sales and ramp up for several years, achieving an annual average of over 2% each year through 2015. From the initial order, the annual electric savings targets were set as shown in Table 23.[45]

Table 23: New York Annual Electric Savings Targets, 2009-2015

2009	2010	2011	2012	2013	2014	2015
2.10%	2.12%	2.16%	2.18%	2.20%	2.23%	2.26%

State agency and utility program administrators all contribute to New York's '15 by 15' goal, as well as savings derived from other state agencies, codes and standards, and improvements to transmission and distribution. LIPA and NYPA, however, are not bound to the EEPS targets by regulation since they are not under the jurisdiction of the NYPSC. Thus while total electricity sales under the 15% by 2015 standard would require savings of roughly 29.4 million MWh annually in 2015, the NYPSC has approved program targets that leave roughly 7.7 million MWh to be achieved by programs outside its jurisdiction.

NYPSC also approved natural gas efficiency targets in May 2009. The targets aim to save 4.34 Bcf annually through the end of 2011 and 3.45 Bcf annually beyond 2011. The downward revision of the target reflects a likely change in program balance following the exhaustion of federal stimulus funding. The natural gas targets are estimated savings goals and do not represent binding commitments, but rather will be used for planning purposes. Combined with reductions from other sources, this target will result in a 14.7% reduction in estimated gas usage by 2020.

Funding and Policy Approaches to Achieve Increased Savings

Funding Increases

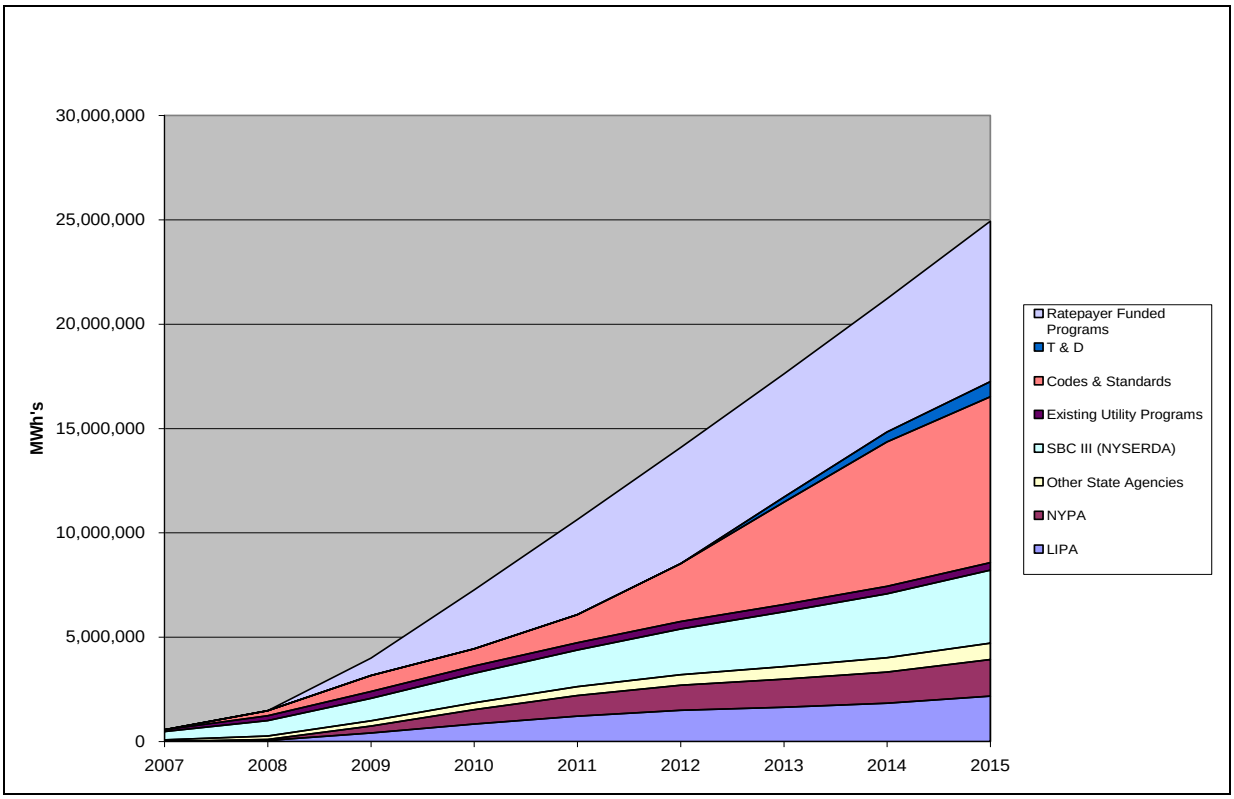
One of the primary changes made in order to facilitate achievement of New York's EEPS energy savings goals has been a major increase in funding for energy efficiency resource acquisition programs, from the SBC (going into NYSERDA and utility EEPS programs) and other sources. The 2008 PSC order directed New York's investor-owned utilities to commence collection, through the System Benefits Charge (SBC), of additional funds to support the EEPS through 2011. For electric energy efficiency programs, the total budget for 2009 increased to $378 million. LIPA's new ten-year, expanded energy efficiency plan will be funded by an efficiency fee on customer bills that the ELI Web site compares to the SBC. NYPA continues to expand their volume of lending.

Savings from Other State Policies

EEPS funding increases will not need to pay for the acquisition of all MWh energy savings needed to reach the statewide "15 by 15" goal. Electricity savings will come from a variety of sources in addition to the expansion or modification of traditional energy efficiency programs at utilities and state agencies, including efficiency gains through transmission and distribution systems, and, most significantly, building codes and appliance standards. This is illustrated in Figure 4 below, from the State Energy Plan.

[45] CASE 07-M-0548, June 23, 2008

Figure 4. Achieving New York State's '15 by 15' Goal



Source: NYSERDA

Source: New York State Energy Plan, Volume I. December 2009.
http://www.nysenergyplan.com/final/New_York_State_Energy_Plan_VolumeI.pdf

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In the chart above, four of the larger savings "wedges" correspond to portfolios of relatively traditional electric efficiency programs: New Ratepayer Funded (Utility Administered) Programs, Existing Utility Programs, the resource acquisition components of SBC III (NYSERDA), and some of the LIPA programs. The above graph was made prior to the currently-pending re-alignment of "resource acquisition" programs and Technology and Market Development programs.

Additional Utility Programs

Regarding Ratepayer Funded Programs, program administrators submitted plans in 2009 to the PSC for "Fast Track" programs under the EEPS, for both natural gas and electric programs. During the next year and a half following the EEPS Order, the PSC approved 85 electric and natural gas programs. For example, Consolidated Edison and Orange & Rockland Utilities jointly filed for residential electric HVAC, residential gas HVAC, and Small Business Direct Install program plans. These EEPS plans were for the 2009-2011 three year period. Con Edison's Small Business Direct Install Program plan as proposed was to save 289,909 MWh, the sum of the first-year savings in each of the three years. Their residential gas HVAC was slated to save 188,632 dekatherms over the same period.

LIPA

LIPA is functioning under an overall ten-year Electric Resource Plan that runs from 2010 to 2020; their energy efficiency organization, Efficiency Long Island (ELI), has a 10 year, $924 million energy efficiency plan that began at the start of 2009 and will continue through the end of 2018. ELI substantially expands the portfolio of energy-efficiency programs and funding beyond those that were in place through its predecessor, the Clean Energy Initiative (CEI). CEI ran from 1999 to 2008, with a total budget of $355 million, which included renewables, research and development, and conservation in addition to efficiency spending.

NYPA Efficiency Investment Financing
NYPA does not provide traditional incentive-based efficiency programs, but instead makes energy savings possible via their lending efforts. Their plans to achieve greater energy savings are based on increased investment. They currently have $300 million in loans outstanding. Over the course of the EEPS period from 2008 to 2015, NYPA will have provided $1.5 billion in financing for energy efficiency projects, almost as much as their total since inception. NYPA borrows short-term commercial paper notes and does not receive funds from the SBC. Customers are large, stable institutions such as the City of New York and the state university campuses, and therefore represent extremely low default risk. This enables NYPA to lend at rates as low as 0.7%.

Administrative and Program Strategies to Achieve Increased Energy Savings

Institutional-Level
On September 20, 2010, NYSERDA petitioned the NYPSC to accept its *Vision for the Future*, a four point plan covering the next five years of the SBC funded energy efficiency programs. In spite of the diversity of organizations that contribute to the statewide EEPS goals, NYSERDA efforts overall still account for approximately two-thirds of the electric savings and about sixty percent of the natural gas energy savings. NYSERDA's proposal would continue SBC funding at the increased levels that have been in place since the 2008 Order establishing the EEPS.

As the largest program administrator, NYSERDA is re-aligning the administrative structure that houses energy efficiency programs and portfolios. NYSERDA has received approval from NYPSC to reorganize EEPS and SBC III funding and portfolio composition. Effective July 1, 2011, Resource Acquisition programs in the SBC portfolio, and their budgeted funds, will be extended for six months and moved over to merge into their EEPS counterparts. A second portfolio, Technology and Market Development, will continue to stay within SBC and continue to be funded with SBC funds.

These re-aligned programs are both gas and electric and include Residential Multi-Family Building Performance, Low Income Multi-Family Building Performance, EmPower NY, Existing Facilities, High Performance New Buildings, and Technical Assistance.

Two other SBC III resource acquisition programs that have not had parallel EEPS programs running concurrently are the Single Family Home Performance program and the Low Income Single Family Home Performance program. These make up $17 million ($11 million electric, $6 million gas) of NYSERDA's $98 million annual resource acquisition budget. The NYPSC ordered EEPS staff to decide whether the programs will continue and if so, to propose new operating plans.

The natural gas measures that have been funded by electric ratepayers in the past under the System Benefits Charge will be funded by gas ratepayers when the extension period begins in July 2011.

Sector-Level
Among the major program administrators contacted for this report, LIPA volunteered its expectation that most of the growth in savings in the coming years at Efficiency Long Island will come on the commercial side, from prescriptive lighting, custom, and whole-building comprehensive programs.

Program-Level
Program offerings at LIPA which they are confident will achieve their planned energy savings levels in the near term include Home Performance with ENERGY STAR, direct install (HP Direct), central air conditioning, low income REAP, and a wide array of product and appliance incentive programs such as air conditioners, pool pumps, and a refrigerator bounty program.

LIPA has shifted its marketing and communications approaches to include video testimonials, more visuals, and YouTube. In the past, customers were notified of available rebates via mailings, tradeshows, bill stuffers, local papers. Now advertising and marketing are focused on the decision makers—if the customer is a school, for example, the buildings and grounds manager would be targeted. Efforts are underway to improve marketing coordination with the trades, because the tradesmen need to both know

the efficiency programs and be able to sell it. For example, a local electrician needs to be aware of which rebates are available and how much.

NYPA also reports marketing more aggressively. For its large downstate electric customers, including the City of New York, NYPA is developing sophisticated tools such as internet-based energy management systems.

Consolidated Edison, after having some programs implemented for over one year, does not anticipate any major changes during this program cycle to the mix of measures that are included in programs because of the time it takes to petition the PSC for modifications. As of late 2010, it was considering increasing rebates for residential sector programs.

Early Results, Responses, and Outlook

Although some results have been inconsistent and there have been challenges to overcome during the first two years since the EEPS Order in 2008, there have been many initial successes.

Due to the scale and complexity of utility energy efficiency institutions and programs, one common element linking successful efforts to ramp-up savings is collaboration—especially collaboration across institutions that enables integration, coordination, and standardization. Everyone interviewed for this report mentioned how important collaboration is to the structure and effective functioning of the state system as a whole.

Several challenges arose which influenced the effectiveness of the initial EEPS program ramp-up, many of which are being addressed through collaborative approaches.

Challenges

In the first years of the EEPS, the investor-owned utilities as a group were not on target to meet their goals. Con Edison reported falling short of their goals for 2010, in spite of having built the infrastructure to achieve required savings going forward, and they attribute this to effects of the economic recession. The investor-owned utilities have petitioned the PSC to change the incentive structure, which currently penalizes them if they acquire less than 70% of the target savings level. New York's largest utilities—including Con Edison, National Grid, and LIPA—are in a "rapid start" situation, as they are new administrators of some of the largest efficiency portfolios in the nation on a steep growth curve. They are working alongside NYSERDA and NYPA, two of the most well-established and sophisticated administrators and implementers.

Table 24:Statewide Portfolio through December 31, 2010[46]

	All Utilities	NYSERDA	New York State
Percent of 2009-11 Net MWh Target Acquired	35%	54%	**47%**
Percent of 2009-11 Net Dekatherm Target Acquired	80%	28%	**51%**
Percent of 2009-11 Budget Spent	44%	29%	**37%**

Several people interviewed for this report identified market confusion as a concern. Since NYSERDA had been the sole supplier of energy efficiency for so long, customer awareness of the IOU programs is and has been low. When consumers are aware, having two options makes their decisions more complicated. However, customers in general are not complaining because it provides them with multiple financial incentive options from which to choose, allowing them to choose those that best meet their needs. A NYPA representative described their overall model toward financing efficiency as a partnership with a very collaborative style in which they meet frequently with NYSERDA and the utilities, in a "constant effort to reduce market confusion and coordinate [funding sources] EEPS, RGGI, and ARRA" [New York energy

[46] Energy Efficiency Portfolio Standard Program Implementation Status Through the 4th Quarter of 2010. Prepared by: Office of Energy Efficiency and Environment. March, 2011

efficiency portfolio standard, Regional Greenhouse Gas Initiative, and American Recovery and Reinvestment Act].

A third challenge has been that program plans had initially been designed to meet cost-effectiveness standards at the program level. The PSC interpretation shifted toward measure-level tests after many initial program plans had already been approved. This may have the general effect of improving savings-per-dollar in the short run, but disallowing some of the less cost-effective energy-saving measures that would otherwise be implemented by being bundled in with highly cost-effective measures.

Positive Developments

One approach to coordination has been the alignment of programs by industry. For example, National Grid and NYSERDA have a collaborative effort in the health care sector effort centered on hospitals. NYSERDA has a new, fast-growing program focusing on data center efficiency with Consolidated Edison, which has the service territory with the highest concentration of data centers in the state. NYPA and the Electric Power Research Institute are also involved in the data center partnership.

Con Edison has also collaborated at the program level, working with NYPA, New York State Electric and Gas Company (NYSEG), National Grid and others to develop a common delivery platform for their Small Business Direct Install Program.[47]

In a major move toward standardization, on October 18, 2010, the NYPSC issued an Order Approving Consolidation and Revision of Technical Manuals, in which they approved the "New York Standard Approach for Estimating Energy Savings from Energy Efficiency Programs—Residential, Multi-Family and Commercial/Industrial Measures." The order updated and consolidated five separate technical manuals that had been approved since the issuance of the EEPS order, covering all major energy efficiency sectors.

NYSERDA's New York Energy $mart^{sm} Commercial Lighting Program, recently recognized by ACEEE in *States Stepping Forward: Best Practices For State-Led Energy Efficiency Programs*, exemplifies the benefits available when programs are integrated and aligned. The program saves 78.6 GWh annually. In our report, we write:

> For market transformation programs to remain viable and effective, they must evolve and address the changing needs of participants and end-users. . . . Integration and conformity with other related programs, emerging technologies, and ever-changing best practices are also critical.(Sciortino 2010)

Prognosis

Program administrators state that the outlook is good for New York to achieve '15 by 15' EEPS energy savings goals. A NYSERDA representative said that there is pent-up demand for energy efficiency projects, and that NYSERDA can meet savings goals for commercial and industrial sectors. This is significant because business sector savings historically make up between two-thirds and three-quarters of the total cumulative savings. Consolidated Edison claims they will meet their full goals by 2015. NYPA, while not mandated to do their proportional share of the '15 by 15' EEPS as utilities are, predicts they will continue to meet or exceed their lending goals for energy efficiency investments.

Reference

Sciortino, M. 2010. *States Stepping Forward: Best Practices For State-Led Energy Efficiency Programs.* Washington, D.C.: American Council for an Energy-Efficient Economy.

[47] Expedited Fast Track Electric and Gas Energy Efficiency Programs Implementation Plans, Consolidated Edison Company of New York, Inc. and Orange and Rockland Utilities, Inc. Case 08-E-1007, 08-G-1008, 08-E-1003, 08-G-1004

Vermont

Background

Vermont has had extensive energy efficiency programs since 1990. Originally, programs were run by the state's utilities under jurisdiction of the Vermont Public Service Board (PSB), but in 1999 the PSB transferred operations to Efficiency Vermont, a statewide[48] "energy efficiency utility" supported by public benefits funding. Efficiency Vermont offers energy efficiency programs and services in the electricity sector as well as in the unregulated fuels sector including wood, propane, and heating oil. There are also natural gas efficiency programs administered and implemented by one utility, Vermont Gas Systems, Inc. Natural gas efficiency programs are supported by legislation and regulation of heating and process fuels (30 V.S.A. section 235(d); Docket No. 5270 VGS-1, 2) and began in 1993.The natural gas programs saved 97,924 MCF in 2008 and have saved over 800,000 MCF since their beginning in 1993.

Prior to the ramp-ups in funding and savings levels over the last few years that are discussed below, Vermont's energy efficiency programs through Efficiency Vermont had already been yielding significant results. By 2005, savings had cumulatively met over 5% of Vermont's electricity requirements already. In 2006, efficiency savings were about 1% of sales.

Vermont pioneered the model of a statewide "energy efficiency utility" (EEU) after Vermont enacted legislation in 1999 authorizing Vermont Public Service Board (PSB) to collect a volumetric charge on all electric utility customers' bills to support energy efficiency programs. Volumetric charges are assessed on a per kWh or per therm basis. Vermont PSB created the EEU, Efficiency Vermont, to use these public benefits funds to provide programs and services that save money and conserve energy.

The PSB role is similar to that of a Commission in other states; the Department of Public Service is separate and is part of the executive branch. Vermont is one of two states that established statewide public benefits funding without electric utility restructuring. The program administration model has the PSB at the top. Until recently, Efficiency Vermont was run by a competitively-selected contractor, the nonprofit Vermont Energy Investment Corporation (VEIC), but now VEIC has a long-term appointment. The previous structure was that the PSB also employed a contract administrator and a fiscal agent, with an advisory board to provide oversight. The fiscal agent received monies collected by the electric distribution companies and disbursed funds to Efficiency Vermont. Now, VEIC is much more similar to a distribution utility, and the contract administrator and advisor board have been eliminated.

Decoupling

Green Mountain Power (GMP) has an Alternative Regulation Plan, implementing partial revenue-per-customer decoupling, which was approved for a three year period by the PSB on December 22, 2006, and extended three times since then, most recently for the three years beginning October 1, 2010 (Order 7585). The plan includes two annual adjustments to rates, the Earnings Sharing Adjustor and the base rate adjustment, both calculated on a yearly basis (Docket Nos. 7175, 7176. Order 7438). Central Vermont Public Service (CVPS) received approval for an alternative regulatory plan in September 2008, under which it may adjust rates every year based on forecast costs and sales. The plan period ends December 31, 2011 (Docket No. 7336).

Performance Incentives

Shareholders of investor-owned utilities such as GMP and CVPS are not eligible for shareholder incentives because those utilities do not implement the energy-efficiency programs. VEIC, a nonprofit organization, is eligible to receive a performance incentive for meeting or exceeding performance goals established in its Order of Appointment. They do not receive compensation until the achievement has been confirmed by the DPS and the PSB has made a final ruling.

[48] Burlington Electric Department runs its own efficiency programs within its jurisdiction.

Energy Efficiency Portfolio Standard Policy

Vermont does not have energy efficiency portfolio standard legislation with a set schedule of energy-savings percentages for each year as most states with portfolio or resource standards do. Instead, Vermont law requires EEU budgets to be set at a level that would realize "all reasonably available, cost-effective energy efficiency." Until recently, specific energy-savings levels—not “soft” goals or targets—were then fixed contractually as part of the negotiation process with EEU contractor VEIC. Under the new structure, there is a “demand resources plan” to set goals and budgets for the next 20 years, corresponding with the long-range transmission plan. These goals and budgets are revised every 3 years.

Much of the legislative and regulatory framework that provides the foundation for demand-side resources to play the major role that they do in meeting the state’s energy needs has been in place since the 1990’s. State statute (30 VSA Sec. 218c) mandates all electric and natural gas utilities to prepare and implement least-cost integrated resource plans:

> . . . at the lowest present value life cycle cost, including environmental and economic costs, through a strategy combining investments and expenditures on energy supply, transmission and distribution capacity, transmission and distribution efficiency, and comprehensive energy efficiency programs.

Vermont has a well-established regulatory process to factor the Energy Efficiency Utility's energy savings into utility companies' load forecasts.

Funding and Policy Approaches to Achieve Increased Savings

Substantial funding increases through the Energy Efficiency Charge (EEC) included within customer rates have built on this foundation to enable the unprecedented energy savings achieved over the last five years.

One turning point came from the state legislature in the form of Act 61 of 2005, which removed the spending cap on the EEU annual budget. This gave the PSB the flexibility to determine appropriate funding levels in the context of the integrated resource planning process. Vermont already had the highest per-capita investment in electric efficiency of any state at $22.54 per person in 2004, prior to the two most recent performance cycles, despite having reached their spending cap. A 2006 PSB Order increased funding from the previous maximum of $17.5 million up to $30 million per year for the next three years. The current plan for 2009-11 increases that to approximately $33 million per year from ratepayers. Including Regional Greenhouse Gas Initiative (RGGI) and Forward-Capacity Market (FCM) funds used for nonregulated fuels efficiency programs pushes the annual total into the $40 million range. In late 2006, Efficiency Vermont began to expand its programs again and targeted four areas of the state with significant transmission and distribution constraints, called geo-targets, for concentrated efforts to reduce peak demand. These areas have also achieved incremental energy savings because of the concentrated efforts on the community level.

The EEU structure ensures that as an efficiency program implementer, VEIC does not have conflicting incentives. They are not an investor-owned for-profit utility, have no rate base, and thus, no throughput incentive. The positive incentive is very strong: for the period from January 1, 2009 to December 31, 2011, VEIC can earn up to $2,180,000 in awards for meeting electric energy saving goals, calculated by a weighted formula.

Another important feature of the policy environment for efficiency in Vermont is that long-term planning and long-term perspective for are accorded great importance. This is being demonstrated by the Investigation into Energy Efficiency Utility Structure (Docket 7466) at the PSB. The investigation considered switching from a 3-year energy efficiency utility performance contract to a 12-year Order of Appointment. The new structure has 20-year electric energy efficiency budgets and 10-year goals.

Natural gas comprises a comparatively small fraction of the energy used in Vermont relative to other states. Still, the scope, funding, and impacts of the energy efficiency programs administered and implemented by Vermont Gas Systems have grown over the last ten years. Annual program spending on all natural gas DSM has increased from $800,000 in 2000 to $1.98 million in 2009. Annualized energy savings have increased from 42,000 MCF in 2000 to over 60,000 each year since 2006.

Administrative and Program Strategies to Achieve Increased Energy Savings

Within each three-year performance contract period, Efficiency Vermont has program plans that are updated annually. The 2011 plan builds on 2010's established strategies in five markets: business new construction, business retrofit, residential new construction, residential retrofit, and efficient products.

Efficiency Vermont has as many if not more staff per dollar of budget than any comparable efficiency organization in the country, such as Energy Trust of Oregon or Wisconsin Focus on Energy. Consequently there is much less emphasis on rebates and financial incentives and more on people. EV gives this approach credit for a greater yield of energy savings.

EV has consolidated business Account Management, which now account for a quarter of total portfolio savings. They emphasize a long-term, relationship-based approach that addresses market opportunities, not urging retrofit. The 300 largest accounts will always be working with the same person at EV, so customers build relationships with individuals, not only with the organization. For example, if a plant or facility manager is planning investments, they will call their EV Account Manager first, early in the planning and budgeting process. They can access money and advice from EV, technical assistance with process improvements, and actively build-in more efficiency savings into their construction or retrofit projects. With this approach the customers know they have a trusted resource to bring in on major projects to increase energy efficiency. There is much less resistance in the interactions between business customers and Efficiency Vermont Account Managers. This is the counter to an approach that says, in effect, "I'm here to do an audit, in order to get your business, to make changes you did not expect."

The Efficient Products Program, with a large share from lighting, makes up another quarter of total portfolio savings. With high CFL saturation, they are moving toward dimmable, 3-way and specialty CFL's and LED's. From 2009 to 2010, resources were shifted to increase specialty bulbs up from 10 percent to 20 percent. Much of this has been done by going upstream, buying down the price of CFL's to 99 cents and making them more widely available at retail, even including convenience stores and gas stations.

Within lighting, an approach gaining substantial energy savings is upstream commercial efforts featuring the use of lighting designers to decrease lighting density. EV has built strong relationships with lighting designers, who can help customers save money that in turn helps to pay for their lighting design audits. Working under a performance-based appointment allows EV to allocate funds to where they can buy the most energy savings with each budget dollar. Relative to other program administrators, they do more custom projects, and are not constrained to work off of prescriptive measures and prescriptive projects. This allows for incentives to be entirely negotiated with the customer, with EV effectively buying down the cost of the project or measure until it becomes an attractive investment for them.

The evaluation, measurement, and verification environment they operate in may be a contributing factor toward their nation-leading levels of savings achieved: Efficiency Vermont gets credit for approximately 90 percent of the energy savings they report to the State. As the primary and clearly dominant efficiency entity in Vermont for more than a decade, there is little competition for energy savings attribution, and evaluated energy savings include spillover that compensates for free-ridership. A related issue is the use of the Societal Cost Test to measure cost-effectiveness, which allows some efficiency measures to be deemed as having a positive benefit-cost ratio, which may not be the case under other cost-effectiveness tests. The VEIC appointment does, however, require a 1.2:1 factor of gross electric benefits to spending, which they far exceed.

Results, Responses, and Outlook

Efficiency Vermont has saved 311 GWh between 2006 and 2008, exceeding its three-year savings goal of 261.7 GWh. In 2007 and 2008, savings from energy efficiency measures more than offset the average underlying rate of electricity load growth. The GWh savings goal for the current period established in the contract is 359,700, a thirty-seven percent increase over the prior goal. They surpassed 2009 savings of 85,000 MWhs in 2010 by 29,000 MWhs, savings 114,000 MWhs for a 34% increase.[49]

The aggressive electric energy efficiency measures have proven to be consistently cost-effective. In 2007, Efficiency Vermont saved 103 GWh at a cost of 2.7 cents per kilowatt-hour (over the life of the measures) according to its annual reports. In 2008, Efficiency Vermont saved 150 GWh at a cost of 2.9 cents per kilowatt-hour, spending $31 million on efficiency programs. Vermont plans to reduce its electricity consumption by 2% per year during the current three-year cycle, according to plans for 2009-2011. In 2009, the annualized natural gas savings attained by Vermont Gas Systems dropped from 97,924 mcf to

Efficiency Vermont essentially does not offer traditional energy efficiency programs at all. As they operate under a performance contract model, they have flexibility and wide latitude relative to program administrators in other states to change their approaches to achieve their savings targets. Barriers to achieving energy savings faced in other states are much smaller, have been addressed effectively, or are nonexistent in Vermont. According to one staff member at EV, “We don’t have a set of twelve programs with clever names to give customers rebates. We get paid for results.”

Staff attribute their success to the alignment between their non-profit structure and their mission: to reduce the environmental and economic costs of energy use. They contrast this with an investor-owned utility having the primary purpose of serving shareholders, and with for-profit program implementers that may have mixed motives and incentives. EV, on the other hand, has a deep culture of innovation and experimentation centered solely on saving energy.

Prognosis

Vermont has achieved highest percent energy savings in the electric sector of any state. In recent years the GWh savings noted above correspond to more than 2% of total sales. Efficiency Vermont is now aiming for 3%, staking out territory in a class by itself ahead of the next tier of states. This track record of energy savings is a result of the combined effect of the legislative and regulatory policies Vermont has in place and by the overall design, approach, and management innovation of Efficiency Vermont (EV).

[49] Efficiency Vermont 2010 Annual Savings Claim. April 1, 2011
http://www.efficiencyvermont.com/about_us/information_reports/annual_reports.aspx

APPENDIX C: RAPID STARTS STATES CASE STUDIES

Arizona

Background

Under the Arizona Administrative Code, electric and gas utilities must file energy conservation plans that must, at a minimum, include customer education and assistance programs to help the public reduce energy consumption and bolster participation in energy conservation programs sponsored by governmental agencies.

Two of the major investor-owned electric utilities in Arizona, Arizona Public Service Company and Tuscon Electric Power Company, operate a variety of demand-side management and energy efficiency programs, applicable to a range of customers. Programs are administered by individual utilities and funding varies by utility. Programs are submitted to and approval is required from the Arizona Corporation Commission (ACC).

Arizona Public Service (APS) operates a number of successful DSM programs for residential and non-residential customers. APS Request for Rate Increase, Docket No. E-01345A-08-0172S, was approved in January, 2010, as Decision Number 71460, which included its energy efficiency implementation plan. According to its 2009 resource plan that maps a strategy for the years 2009-2025, energy efficiency programs will continue to grow. Tucson Electric Power Company (TEP) received approval for its 2011-2012 Energy Efficiency Implementation Plan in February 2011 (Docket No. E-01933A-11-0055).

Southwest Gas and UniSource Energy, the two natural gas utilities in Arizona, also operate energy efficiency programs—primarily rebates for installation of certain energy efficient equipment. Salt River Project (SRP), a public utility, recently released plans to ramp up its energy efficiency programs. Over the next five years, the company plans to invest more than $200 million in electric energy-efficiency and demand response programs.

Arizona's Energy Efficiency Resource Standard Policy

On December 18, 2009 the ACC ordered that all investor-owned utilities and rural electric cooperatives achieve 1.25% annual savings as a percent of the retail energy sales in the prior calendar year, ramping up to 2% beginning in 2014. By 2020, the state should reach 20% cumulative savings, plus up to a 2% credit for peak demand reductions from demand response programs, for a total standard of 22%. Electric distribution cooperatives are required to meet 75% of the standard in any year. Utilities can count energy supply from combined heat and power systems that do not qualify under the state's Renewable Energy Standards towards the standard, as well as 1/3 of the measured savings from new building codes. Utilities are allowed to credit energy savings achieved during 2005-2010 towards the requirements beginning in 2016. See Docket No. RE-00000C-09-0427, Decision No. 71436.

Utilities must submit an annual implementation plan to detail progress in meeting goals and estimate cost and energy savings for programs over the next two calendar years. Utilities may recover the prudent costs of energy efficiency programs through a DSM tariff and the decision also allows utilities to request the Commission to consider the use of performance incentives to assist in achieving the goals.

Arizona has natural gas efficiency standards aiming to achieve 6% cumulative savings by 2020 (Docket No. 000009B-09-0428 Dec. No. 71855). The companies are allowed to reach this goal through both demand side management (DSM) and renewable energy resource technology (RET) programs.

SRP's publicly elected Board sets the company's energy efficiency and renewable energy. Based on a Feb 2006 Resolution, the energy savings goal is currently 15% of retail requirements from any combination of the sustainable resources (renewable, hydro and energy efficiency) by 2025. The 15% includes the persistence (life of measures) of programs run in previous years. SRP must meet 5% of

retail requirements by 2015. The Board will be revisiting these goals in the Spring of 2011 and open the resolution to public process and comment.

Funding and Policy Approaches to Achieve Increased Savings

Energy efficiency programs offered by investor-owned utilities in Arizona are funded through a systems benefits charge, collected through a non-bypassable surcharge on electricity bills, or through an adjustor mechanism, depending on the utility. A non-bypassable charge is a charge applied to all customer bills in a given region whether they receive service from a local utility or from a competitive supplier. The Consortium for Energy Efficiency reports 2009 electric program budgets totaling $49.2 million, and natural gas program budgets of $4 million.

SRP's programs are funded through an Environmental Cost Adjustment Factor ($/kWh). The company plans on spending approximately $40 million per year on energy efficiency and demand response programs over the next five years.

Decoupling

The ACC recently provided authority for disincentive removal (revenue decoupling) and/or shareholder incentives for natural gas utilities (Docket No. 000009B-09-0428 Decision No. 71855). None of the electric utilities have revenue decoupling.

Shareholder Incentives

APS and TEP have shareholder incentives in place, set at 10% of DSM program net economic benefits and capped at 10% of total DSM expenditures. APS proposed modifying this incentive mechanism in a new rate case filed in 2008, requesting recovery of net lost revenues as well as removal of the cap on the incentive. The cap on the incentive was modified via Settlement Agreement. See ACC Docket No. E-01345A-08-0172, Decision 71448, at page 28 of the agreement, for the new tiered approach.

Administrative and Program Strategies to Achieve Increased Energy Savings

TEP

TEP currently has a residential HVAC program, a Residential Audit and ENERGY STAR program, a full-range commercial program with many different measures, a CFL buydown program, a shade tree program, a low-income weatherization program and a new home construction program.

TEP worked with its stakeholders (cities, counties, SWEEP, large customers, etc.) to get input on its energy efficiency implementation plan. The company continues to work with its measurement and evaluation group to make sure that the programs being proposed make sense for the community.

The company makes sure it gets a good mix of people to work on the programs—both utility staff and the implementation contractors. The philosophy is to hire some people who understand energy efficiency programs and some people who come from different backgrounds that bring their contacts with them. For example, a marketing contractor from the new home sector will contribute to the success of the program through their existing business relationships. TEP works with its trade allies to get feedback on ways to improve its programs.

APS

One of APS' very successful programs is Home Performance with ENERGY STAR. This program includes a whole house check-up for $99 including direct installation of CFLs and an efficient showerhead. The program also offers incentives up to $1000 for air and duct sealing, insulation, etc. Forty percent of participants go on to install larger measures. To date, program participation has surpassed program goals.

APS is partnering with local banks to provide third party financing for energy efficiency measures. Interest rates are between 6.5% and 8%. The banks provide the capital and APS puts up the reserve account.

APS is piloting the OPOWER program. This program allows customers to compare their energy consumption to their neighbors, assists them with setting energy efficiency goals, and informs them of their progress on reaching their goals.

SRP

SRP has a preference for programs with robust and long-lived savings. Powerwise Homes, for example, is a residential new construction program with a 30 year persistence. Comprehensive programs, like Home Performance with ENERGY STAR, are also very important. In this program, a residential customer is offered rebates on multiple measures after receiving a whole house audit.

Fifty-five percent of SRP's total incremental savings comes from its M-Power program. This prepay program, targeted to "credit-challenged" customers and students, provides energy consumption feedback on a display inside the customer's home. The program has over 100,000 participants out of 850,000 residential customers. SRP has determined that this program helps customers save an average of 12% over the company's basic or time of day plans and that 90% of participants are satisfied with the program.

SRP is a member of EPRI and participates in E-source and Chartwell. Employees make a concerted effort to exchange experiences with others on programs that work and programs that do not work. In particular, employees talk to their counterparts at APS. The company has a product development group that is always looking at new programs, ways to overcome adoption barriers, and collaborate to solve problems. SRP also has an internal measurement and evaluation group to provide the company feedback on its programs. The company talks to its customers. The SRP Communications group conducts focus groups. SRP also has a plugged-in panel of about 50 incentivized customers that have agreed to do surveys. This allows the company to get survey results in 2 weeks.

Early Results, Responses, and Outlook

TEP

TEP savings 1% of its retail sales in 2010. In 2011, the company needs to meet the 1.25% energy savings goal.

A large portion of TEP's portfolio comes from lighting. The company is undergoing a risk analysis to see what other end uses are out there that could possibly replace these savings. They are working with Southwest Gas, Unisource Gas, Unisource Electric and APS on this.

On the horizon, Tuscon Electric Power is branching out in several new directions. Among these initiatives under consideration or active development are:

- Evaporative Cooling. In the TEP area, 30% of the homes have evaporative cooling. Weatherization programs do not affect this end use. The company wants to come up with a good evaporative cooling program.
- There are many tele-centers in TEP's service area. The company is looking at offering a program that lends itself to commercial leasing.
- TEP may look at an upstream buy down program model with end uses besides CFLs (like ENERGY STAR appliances). This is a volume-related program that reaches a lot of people.
- The company is looking into a comprehensive behavioral type program—like the Home Energy Report by OPOWER. This is the program that compares a customer to their neighbor.
- TEP is considering in-home energy-use displays—probably combined with a direct load program.
- Direct install program for multifamily residential customers.

The company would like get decoupling and a better performance incentives mechanism.

SRP

SRP is currently exceeding the savings goals of its Sustainability Portfolio Standard. However, the company wants to be realistic about savings expectations—what savings goals can be reached with a reasonable amount of money. Customer satisfaction is a principal goal so it is important that the programs continue to be cost-effective.

SRP is going to focus more on commercial energy efficiency programs. For example, SRP is working on developing specialty programs (compressed air, new construction, metro commission, custom programs, etc.) for commercial customers. The company is also looking at lighting rebates for small business customers.

SRP had a few words of advice:

> "Don't be afraid of trying new approaches; try better, faster, less costly approaches; have an exit strategy if something isn't working; and keep senior management and the Board informed."

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Colorado

Background

Colorado utilities have administered and implemented efficiency programs for their customers for decades, but until recently the overall scope of the portfolios has been modest relative to the top tier of leading states. After the electric utilities spent $15 million on efficiency programs in 1996, Colorado programs were scaled back in the late 1990's, with electric efficiency spending dipping below $3 million in 1998. This was in line with the national trend of reduced efficiency investments corresponding to deregulation and restructuring. The years 2000 to 2005 also had relatively little utility energy efficiency activity in Colorado. During that period Public Service Company of Colorado (PSCo), owned by Xcel Energy, agreed to provide some efficiency programs as part of an agreement that earned them approval to build a coal-fired power plant. In 2004, Colorado ranked 17th among states as ranked by cumulative annual GWh of utility electric savings based on Energy Information Administration data.

Xcel Energy, through their operating subsidiary Public Service Company of Colorado (PSCo), is the largest utility with over 1.3 million customers, two-thirds of the state's retail electric sales, and substantial natural gas sales. Their programs and those of the other investor-owned utilities are funded by a demand-side management Cost Adjustment Mechanism rate rider, also known as a tariff rider. PSCo is allowed to recover the costs for its energy efficiency and demand programs. The second largest electric utility is Colorado Springs Utilities, a municipal utility serving more than 550,000 customers. Statue requires that the Colorado Public Utilities Commission (COPUC) report annual to the state assembly on utility demand side management.

There are five regulated gas utilities: PSCo, Atmos Energy, Black Hills Energy (formerly Aquila), SourceGas, and Eastern Colorado Utility Company. For Colorado natural gas utilities, each utility may recover its program expenditures either through expensing or by adding program expenditures to base rates as a part of, or outside of, a rate case. The gas utilities' overall efficiency budgets had been consistently at or near $2.5 million per year from 2006 to 2008.

As of fall 2009, all Colorado investor-owned gas and electric utilities were implementing PUC-approved energy efficiency programs. PSCo and Black Hills Energy together account for more than 80% of the total projected GWh savings and over 58% of retail electricity sales in the state; municipal utilities and electric co-ops also implement efficiency programs, but make up a smaller proportionate share relative to sales. These projections are under the Colorado Climate Action Plan, an effort to reduce greenhouse gas emissions that relies on energy efficiency to achieve 41% of the emissions reductions.

Prior to the adoption of energy efficiency resource standard policies in 2007, Colorado did not provide alternative business models for regulated utilities, such as revenue decoupling, nor were there shareholder incentive mechanisms for investor-owned utilities.

Colorado's Energy Efficiency Resource Standard Policy

In April 2007, in passing HB-07-1037, the Colorado legislature amended Colorado statutes C.S.R. 40-1-102 and 40-3.2-101-105, requiring the Colorado Public Utilities Commission (COPUC) to establish energy savings goals for electric and gas utilities as well as provide utilities with financial incentives for implementing cost-effective energy-saving programs. The bill requires the COPUC to annually report on the progress made by investor-owned natural gas and electric utilities in meeting their demand side management goals.

The statute does not directly set a fixed schedule of statewide percentages of energy savings to be achieved by particular years, so it is not strictly speaking a resource *standard*. The law does not require the acquisition of all cost-effective energy efficiency resources. Instead it sets an overall multi-year statewide goal for investor-owned utilities of least five percent of the utility's retail MWh energy sales in the base year (2006) to be met by the end of 2018, counting savings in 2018 and including savings from

DSM measures installed starting in 2006. The law empowers COPUC to set interim goals for utilities and to modify goals.

Electric Goals

In a May 2008 decision, the COPUC set energy savings goals for PSCo, superceding the targets established in an earlier Least Cost Planning Settlement, which called for cumulative savings of 800 GWh by the end of 2013.[50] The Commission accepted PSCo's current goals in a Settlement Agreement in Decision R08-1243 in February 2009, which allowed PSCo to amend its original set of goals. The updated goals for 2009 and 2010 were designed to save approximately 0.6% (176 GWh) in 2009 and 0.8% (237 GWh) in 2010, exceeding the mandated savings in both years.[51] It plans to achieve 240 GWh in 2011.[52] PSCo filed new long term savings goals with the Commission in late 2010 that would increase cumulative electric savings for the period between 2009 and 2020 from its original 11.49% goal to 13.61%.[53] These goals are under review by the Commission and some interveners such as the Southwest Energy Efficiency Project (SWEEP) have proposed even higher energy savings and peak demand reduction goals. The Commission is expected to render a decision in this docket by early April.[54]

The Commission accepted a Settlement Agreement in Decision R08-1243 in February 2009 that allowed PSCo to amend its goals. The updated goals for 2009 and 2010 were designed to save over 400 million kWh, or approximately 0.8% in 2009 and 1.0% in 2010, more than the mandated savings for both years.[6] PSCo filed new long-term savings goals with the Commission in late 2010, which would increase cumulative electric savings by 2020 from 11.49% to 13.61%.

Natural Gas Goals

For investor-owned natural gas utilities, the legislation structured the requirement in two parts. First, the natural gas IOUs must set DSM spending targets of more than 0.5% of revenues from customers in the prior year. Then energy savings targets are established by COPUC commensurate with spending and stated in terms of quantity of gas saved per dollar of efficiency program spending.

The legislation directed the COPUC to establish use of a modified total resource cost (TRC) test for evaluating DSM program cost effectiveness. It is considered modified because it includes valuation of emissions reductions.

Table 24: Colorado Natural Gas Energy Savings Targets, 2009-2011

	Savings Target (Dekatherms)		
	2009	2010	2011
Public Service Company of Colorado	318,141	402,808	368,227
Atmos[55]	13,503	19,385	
Black Hills Energy[56]	37,227	48,283	59,302
SourceGas[57]	18,565	23,643	
Eastern Colorado[58]	171	202	

[50] Colorado Public Utilities Commission, Docket Nos. 04A-214E through 216E

[51] Based on 2009 retail sales. Xcel Energy/Public Service Company of Colorado 2009/2010 Demand-Side Management Biennial Plan, Electric and Natural Gas, Docket No. 08A-366EG. Originally filed August 2008, revised February 2009. In this profile, Xcel goals and savings are given at the generator level; these values need to be reduced by about 7% to get savings at the customer level.

[52] PSCo 2011 DSM Plan

[53] Personal Conversation with Deb Sundin, Xcel, 10/27/2010

[54] Docket 10A-554EG

[55] Atmos DSM Plan, pg. 14

[56] Black Hills NG DSM Plan, pgs 69-70. Docket No. 08A-541G

[57] SourceGas DSM Plan, pg. 15

[58] CPUC Docket No. 08A-541G

Funding and Policy Approaches to Achieve Increased Savings

One of primary ways utilities are using to achieve greater energy savings has been to invest more money. Funding for utility energy efficiency has increased rapidly in Colorado under the EERS. According to the revised 2009/2010 Demand-Side Management Biennial Plan, PSCo increased their investment in gas and electric efficiency and demand programs from $63 million in 2009 to $80 million in 2010. Spending on utility natural gas energy efficiency programs was increased from the 2006 to 2008 annual average of $2.5 million to $13 million in 2009 and $18.4 million in 2010.

The Colorado Legislature enacted two laws along with the EERS to align the utility incentive structure—and the business and regulatory model utilities operate in—with achievement of the EERS goals: natural gas decoupling and shareholder incentives for gas and electric utilities.

Decoupling

On June 18, 2007, the Public Utilities Commission approved a partial revenue decoupling adjustment for residential gas customers as part of a three-year pilot program. The proposed mechanism is implemented through a rider applied to the company's base rate gas service revenues to compensate for the prior year's changes in weather-normalized use per customer. This is a three-year pilot program, initially set to run from October 1, 2008 to September 30, 2011. If revenue per residential customer declines more than 1.3% per year, the rate adjustment is updated to recover reduced weather-normalized revenues due to reduced usage per customer. This value (1.3%) was chosen because it equals 1/2 of the historic rate of decline referenced in PSCo's testimony (Docket No.'s: 06S-655G and 08L-413G). Colorado has not implemented decoupling for electric utilities.

Shareholder Incentives

The law gives broad authority to COPUC to allow for "a utility's investments in cost-effective DSM programs to be more profitable to the utility than any other utility investment that is not already subject to special incentives" and instructs COPUC to consider allowing a rate of return on DSM investments higher than on other investments, accelerated depreciation or amortization periods for DSM investment, an incentive to allow the utility to retain a portion of the net economic benefits from a program for shareholders, and an incentive to allow the utility to collect program costs through a cost adjustment clause.

The PUC has implemented a performance-based incentive for PSCo, enabling them earn a return of 0.2-12% of net benefits on its demand-side management expenditures as long as it achieves at least 80% of its energy savings goal in any one year. The incentive is tied to energy savings achieved and the net economic benefits of the programs. The incentive is capped at 20% of PSCo's DSM expenditures. Black Hills Energy has adopted the same mechanism. For natural gas utilities, the incentive bonus is capped at 25% of the expenditures or 20% of the net economic benefits of the DSM programs, whichever amount is lower. For PSCo, the actual award was $9.65 million in 2009, or 17.4% of their $55.45 million in program costs.

Administrative and Program Strategies to Achieve Increased Energy Savings

PSCo has numerous program efforts and enhancements underway to increase energy savings in the near term of one to three years. They have had success with ENERGY STAR New Construction in the Residential sector. PSCo has increased rebates across many programs from 20-25% of the consumer's incremental cost to 40%, and they have begun offering rebates for more products. Also in the Residential sector, PSCo has been running pilot programs for air conditioning, including early retrofits for central air conditioning systems, a tune-up program, and high-performance installation. They are also offering more services, such as small business lighting and process efficiency services. Small business lighting programs in which PSCo hires a lighting auditor for the small business owner have been very successful.

PSCo expects Commercial and Industrial programs to drive most of their energy efficiency, offering a full complement of programs that they describe as among the best in the nation, comparable to those in the Pacific Northwest. These include all the standard prescriptive rebate programs for all the end-uses. They

also offer a very robust Custom program for industrial and large commercial customers; if there is no rebate for the measures, the customer many initiate a proposal for what they would like to do.

Xcel Energy has had successful Industrial energy efficiency programs in other states, such as Minnesota. These have included a bundled approach, which includes energy planning. By combining efficiency measures that are not sufficiently cost-effective on their own with measures that do exceed the cost-effectiveness threshold, large projects with large energy savings may be accomplished that otherwise would not. Xcel is replicating this in the Commercial sector through PSCo in Colorado through their Energy Design Assistance Program for large commercial buildings and new office buildings. Savings have increased 50% for a small group of customers. One key is that the annual planning process that has been business as usual is being displaced by a systems thinking approach. PSCo brings in a consultant (Inventa 1 to 5, an Australian company) to work with the customer, who does a facility walk-through, and then develops a three year commitment document. PSCo brings in energy analysis, a Bundle Rebate form, and a bonus financial incentive for the bundled project, and provides project management help. The process helps to build working relationships between Xcel Account Managers and large commercial customers, and to establish multi-year planning as the norm.

Early Results, Responses, and Outlook

With PSCo contributing such a large part of the energy efficiency activity statewide, their success has a major impact on the progress of the state as a whole. Leveraging parent company Xcel Energy's years of program delivery experience in Minnesota, PSCo surpassed their planned 2009 and 2010 electricity savings goal of 175 GWh each year, saving 219 GWh in 2009 and 237 GWh in 2010. For natural gas, Xcel had already budgeted 250% of the minimum spending requirement prior to the EERS, as gas prices had doubled due to suppliers building a pipeline out of the Rocky Mountains. Now that prices have declined again, energy efficiency measures are much less cost effective, many with a total resource cost of 1.1. In 2009, the first EERS year and the first year in which PSCo had a complete and comprehensive efficiency plan in place, savings were 308,761 Dth, or 97% of the goal the Commission-approved plan.

Prognosis

With the aggressive savings increases planned over the next three to four years, PSCo will build on their strong commercial and industrial programs, expanding CFL and Commercial Lighting. By 2014 to 2015, however, there is expected to be a gap between the savings targets and what the current portfolio of traditional programs can deliver. In addition to continuing and expanding existing programs, PSCo will be exploring new directions. Pilot behavioral programs in the Residential Sector are now in the field. Using more customer education and providing more data, these programs give customers more control over their household energy use. As smart grid technologies such as advanced metering infrastructure and others evolve, PSCo may be able to provide features such as two-way communication, specialty rates to incentivize efficiency for customers, and enabling technology by 2014-2015.

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Pennsylvania

Background

Pennsylvania is in the process of ramping up from virtually no efficiency programs at all to a major, multi-sector portfolio within three years. This is one of the fastest expansions of any state in the country. Before Act 129, Pennsylvania had Four Sustainable Energy Funds that had been created as a result of individual settlements with the state's five major distribution utilities to promote both renewable energy and energy efficiency. In 2007, approximately $6.5 million was distributed in the form of loans and $2 million was provided in grants from all SEF's. West Penn Power SEF is the only fund still collecting funds through distribution and transmission rates, currently at $0.001/kWh. With the implementation of Act 129, utilities will spend hundreds of millions in three years.

According to the Energy Information Administration, Pennsylvania utilities reported efficiency program savings of 2,715 MWh in 2008, less than 0.01% of total retail sales. This number is improving dramatically as the state ramps up its energy efficiency efforts.

Of the eleven electric utilities, there are seven major companies, and the largest of those are First Energy, Philadelphia Electric Company (PECO) and Pennsylvania Power and Light (PP&L) as shown in table XX below. First Energy Corporation acquired Allegheny earlier in 2011 and will operate it under the operating company West Penn Power. First Energy also owns Pennsylvania Power and Pennsylvania Electric.

Table 25: Largest Electric Operating Utilities in Pennsylvania

Utility (Parent Company)	2009 Retail MWh sales (1,000's)	Planned MWh savings (1,000's)	Percent Planned 3-year Savings
PECO (Exelon)	37,723	1295	3.43%
Allegheny (First Energy)	NA	646	NA
PP&L	36,659	1362	3.72%
Duquesne	NA	576	NA
Penn Power (First Energy)	2,063	146	7.08%
Metropolitan Edison	13,481	448	3.32%
Pennelec (First Energy)	13,090	447	3.41%

For this case study, we only conducted one interview. The emphasis on PECO is only to provide an example case and is not meant to be representative of other electric distribution utilities.

Regulatory Policies

Pennsylvania does not have any policy that decouples utility profits from sales volume and no policy that rewards successful energy efficiency programs through shareholder incentives.

Pennsylvania's Energy Efficiency Resource Standard Policy

Act 129, passed in October 2008, established an energy efficiency resource standard in Pennsylvania. Each electric distribution company (EDC) with at least 100,000 customers must reduce energy consumption by a minimum 1% by May 31, 2011, increasing to 3% by May 31, 2013.[59] Peak demand must be reduced by 4.5% by May 31, 2013. PECO's share of the statewide goal translates to 394,000 MWh by 5/31/11 and 1.2 million MWh by 2013. The percentage consumption reductions are solely applicable to the seven EDC's, not relative to total state electric use. Less than 5% of savings were planned to come from non-program sources including conservation voltage reduction, distributed resources, and energy savings resulting from time-of-use rates.

Ten percent of both consumption are to come from federal, state, and local government, including municipalities, school districts, institutions of higher education and nonprofit entities. The PUC must also set targets for the period beyond 2013. Failure to achieve the reductions required (load and/or peak demand) subject the EDC to a civil penalty of not less than $1M and not to exceed $20M.

Under the new legislation, the electric distribution companies' energy efficiency and conservation plans have a cost-recovery tariff mechanism to fund the energy efficiency and conservation measures and to ensure recovery of reasonable costs. The utilities can also recover the costs through a reconcilable adjustment mechanism. This will bring in over $200 million per year by 2011. However, the law also institutes an annual spending cap of 2% of the total annual EDC revenues as of December 31, 2006 for Energy Efficiency and Conservation (EE&C) programs.

There is no natural gas EERS in Pennsylvania.

Programs and portfolios must have a benefit cost ratio greater than 1.0 as measured by the Total Resource Cost Test. Evaluation, measurement, and verification are done through a statewide evaluator. The statewide process was initiated in September, 2009 by GDS Associates, Inc., Nexant and Mondre Energy are also on the evaluation team.

Penalties

Pennsylvania has no "carrots" such as performance incentives or shareholder incentives to reward successful energy-saving on the part of the utilities, but the state does have strong "sticks" in the form of financial penalties. This is an uncommon policy among states with energy efficiency resource standards. Utilities face civil penalties starting at $1 million and going up to $20 million if they do not meet targets by May 31, 2011 and May 31, 2013.

Funding and Policy Approaches to Achieve Increased Savings

In October 2009, the PUC approved Energy Efficiency and Conservation (EE&C) plans for the seven electric distribution companies covered under Act 129.[60] The PUC supported the utilities in meeting extremely aggressive and rapid efficiency goals by allowing flexibility in the design of the EE&C plans, setting rules that allowed EDC's to craft plans that would work for their service territory and customers.

Funding is prerequisite to succeeding in the accelerated development of comprehensive energy efficiency program portfolios. Pennsylvania had the third largest absolute growth in electric efficiency program budgets of any state from 2009 to 2010, rocketing from $1 million to $151 million[61]. Only New York and California increased budgets more.

Administrative and Program Strategies to Achieve Increased Energy Savings

[59] Implementation Order http://www.puc.state.pa.us/electric/pdf/Act129/EEC_Implementation_Order.pdf
[60] http://www.puc.state.pa.us/general/publications_reports/pdf/09-10_PUC_Ann_Rpt.pdf
[61] State of the Efficiency Program Industry: Expenditures, Impacts & 2010 Budgets, Consortium for Energy Efficiency.

The utilities' planned allocation of program budget funds and expected savings from residential and business sectors varied widely. Met Ed and Penelec committed 50% and 43% of their EE&C Plan funding to residential. Both expect over 46% of plan benefits to come from these residential programs. Duquesne, Allegheny and PPL budgeted the most for commercial and industrial programs, and committed only 29% to 39% of EE&C Plan funds to residential.

PECO began the first program year with a portfolio of programs for electric customers. The company combined program introduction with trade ally outreach to make sure the market was aware and to prepare contractors for informing customers about the energy efficiency offerings available. PECO initiated an awareness campaign for their Smart Ideas brand with advertisements and outreach through a diverse array of media including television, radio, billboards, magazines, bill inserts, programmatic events such as community seminars and tabling talks.

After the initial rollout, more measures were added to the programs for commercial and industrial customers. Efficient televisions were added in the residential sector. PECO also revised incentive levels. In order to get more immediate savings, they will be shifting more money into the CFL program, and cut funds flowing to Residential New Construction and Residential Whole Home Performance (comparable to Home Performance with ENERGY STAR).

The PUC created a registry of qualified Conservation Service Providers (CSP's). Each utility EE&C plan must include a contact with at least one CSP to implement at least part of their programs.

PECO's structure for energy efficiency relies heavily on implementation contractors, one for each program or area. Jayco is the contractor for refrigerator pick-up and recycling, ECOS implements CFL and Smart Home rebates, and Navigant Consulting does evaluation, working closely with the statewide evaluator hired by the PUC. For initial energy efficiency plan development, PECO worked with outside consultant Global Energy Partners.

Early Results, Responses, and Outlook

Pennsylvania utilities officially began implementing programs counting towards their EERS on June 1, 2009. Because EE&C plans were not approved until October, there was some delay for utilities to implement programs. So far, there has been a major discrepancy between the performance of major utilities (PECO, PPL) and that of smaller utilities with less experience implementing efficiency programs. The 1st quarter report of Program Year (PY) 2 seems to indicate, however, that all of Pennsylvania's utilities are now achieving significant savings levels, which may put the state on track towards meeting their EERS goals.[62] In the cases of Allegheny, Met-Ed, and Penelec, savings in the 1st quarter of Program Year 2 exceeded all of those of PY 1. Twenty-seven programs began in the 1st quarter of PY 2, compared to 38 initiated in all of PY 1.

[62] Pennsylvania has a Statewide Evaluator, which reports on implementation status quarterly. As of the drafting of this report, the latest confirmed savings data comes from Program Year 2 (2010-2011) 1st Quarter Report.

Table 26: Pennsylvania Energy Savings as Percent of Targets 2011-2013

Program Administrator	Percent of 2011 Target Achieved end of PY 1	Percent of 2011 Target Achieved end of 1st Quarter, PY 2	Percent of 2013 Target Achieved
Allegheny	1.4%	8.9%	0.50%
Duquesne	19.0%	33.0%	11.0%
Met-Ed	8.2%	18.7%	6.2%
Penelec	8.9%	25.5%	8.5%
West Penn Power	11.7%	22.5%	7.5%
PECO	40.0%	83.0%	28.0%
PPL	22.0%	39.0%	13.0%
STATEWIDE	**19.0%**	**38.54%**	**12.85%**

PECO customers responded overwhelmingly to initial program offerings, which were done on an appliance-by-appliance basis for dishwashers, refrigerators, air conditioners, heat pumps, dehumidifiers, and others. In order to stay within budget, they reduced rebate levels.

Early lessons learned from PECO highlight that it is important to:

- have the evaluation, measurement, and verification provider and the database for savings and project tracking in place before programs are rolled out.
- ensure that the Commission is in alignment with the Statewide Evaluator on how savings projections will be made and the assumptions going into the savings claim. Elements such as measure lives, M&V protocols, the technical resource manual and sampling plans should be agreed on.
- stay in close, frequent communication with implementation vendors on a daily basis concerning customer experience, timelines, and management.

Prognosis

In 2010, PECO had exceeded the first savings checkpoint. A PECO representative expressed "absolute 100% confidence" that they will continue to meet their energy savings objectives for total MWh. In 2009, they expected to exceed targets by 50% in 2010 and by 10% Program Year 2012, a cumulative savings of 1.3 billion kWh. Government and non-profits had been moving slower due to budget issues. PECO is addressing this with special outreach.

At PECO, market transformation has been discussed, however, they have not set specific objectives in that area. PECO operates their energy efficiency programs in the context of their three-year goal, whereas market transformation requires a long-term perspective. Statewide, this emphasis on hitting annual and three year is encouraged in Act 129, which asks the Public Utilities Commission to assess the first four years of programs (2009 to 2012).

References

Pennsylvania Public Utility Commission. 2011. *Pennsylvania Public Utility 2009-10 Annual Report* http://www.puc.state.pa.us/general/publications_reports/publications_reports_yearly.aspx

Illinois

Background

Prior to legislation passed in 2007, there was limited funding and little associated utility energy efficiency administration infrastructure in Illinois. The state had minimal involvement with utility energy efficiency

programs, other than a small annual funding requirement (~ $3 million/year) created in the Illinois restructuring legislation (HB262) in 1997 to support some small programs administered by the state Department of Commerce and Economic Opportunity (DCEO).

Commonwealth Edison (ComEd) and Ameren Illinois Utilities (Ameren Illinois) are the largest electric utilities in Illinois. ComEd service territory covers most of northern Illinois, overlapping with Nicor Gas across northernmost third of the state, except for the City of Chicago, which is served by Peoples Gas, and Integra company. Integra also owns North Shore. Ameren Illinois is comprised of Illinois Power, Central Illinois Public Service, and Central Illinois Light Company. Ameren Illinois is also the third largest Illinois natural gas distribution company by number of customers.

Illinois Energy Efficiency Resource Standard Policy

The scope of energy efficiency activity began a dramatic expansion in July 2007, when the Illinois legislature passed the Illinois Power Agency Act (IPAA), which includes requirements for energy efficiency and demand response programs. Under the new law, utilities, with help from the Illinois Department of Commerce and Economic Opportunity (IDCEO), are directed to implement cost-effective energy efficiency programs and measures sufficient to achieve annual energy savings in order to reduce direct and indirect costs to consumers. The targets of Public Act 095-0481 are 0.2% of energy delivered in 2008, increasing by 0.2% per year until 2012 and increasing 0.4% from 2012 until 2014 and reaching 2% savings in 2015.

SB1592 authorized utilities to recover the costs for providing energy efficiency programs and directs utilities to design and implement cost-recovery tariffs. Funds from the tariffs cover both utility- and state-administered programs. These are referred to as Energy Efficiency Plan (EEP) charges.

Savings may be accomplished by avoiding or delaying the need for new generation, transmission, and distribution infrastructure. Because Illinois is still technically a "restructured" state—with distribution utilities purchasing power in competitive wholesale markets, it is not clear how energy efficiency would be factored into resource planning decisions. Customers also purchase power directly from Retail Electric Suppliers (RES).

Individual electric utilities are required to administer 75% of the total energy efficiency program funds. The Illinois Department of Commerce and Economic Opportunity (IDCEO) administers 25% of the funds, which are used to for efficiency programs serving government facilities, low-income households, and market transformation-oriented information and training programs. In 2008, Illinois set up requirements for natural gas energy efficiency programs.

Rate Cap and Penalty

The total charge to customers is limited to 0.5% of their total rate base in year one. The cost increases year until it reaches 2.0% per year in 2015. If, after 2 years, an electric utility fails to meet the efficiency standard it must make a contribution to the Low-Income Home Energy Assistance Program. The combined total liability for failure to meet the goal shall be $1,000,000, which is assessed as follows: a large electric utility such as ComEd shall pay $665,000, and a medium electric utility shall pay $335,000. A large electric utility is an electric utility that, on December 31, 2005, served more than 2,000,000 electric customers in Illinois while a medium electric utility served 2,000,000 or fewer but more than 100,000 electric customers in Illinois on December 31, 2005. If a utility fails to meet their goals (or modified goals), then programs could be transferred to the Illinois Power Authority. Utilities have expressed concern that the if that were to happen then the programs might not be deployed as effectively for customer benefit.

Illinois established a natural gas EERS in SB 1918 establishes a natural gas savings target that begins with 0.2% savings by May 31, 2011 and ramps up to 1.5% in 2019, providing cumulative savings of 8.6% in 2020. For all programs, there is a rate impact cap of 2% of overall rates over the three-year reporting period.

Decoupling

In February 2008, North Shore Gas and Peoples Gas and Coke were both approved for four-year revenue-per-customer decoupling pilots. Monthly adjustments began in March 2008. To continue the program after four years, the utility must make a general rate filing in which the commission extends the program. (Cases 07-0241/07-0242 (consolidated) and 09-0166/09-0167 (consolidated)). Electric utilities are not authorized for decoupling or lost revenue recovery.

Shareholder Incentives

Illinois does not have a mechanism in place for utility shareholder incentives for energy efficiency. SB1592 does not address the issue

Under the EEPS, cost-effectiveness is determined at the measure level using the Total Resource Cost (TRC) test. Duel-fuel utilities such as Ameren Illinois are permitted to count the avoided costs of both gas and electric energy impacts from each measure. The law requires that the benefit cost ratio using the TRC be greater than 1.0 in the annual filings, which are done after the program evaluation reports are completed, and which are calculated using net energy savings, not gross.

The energy savings goals are net savings overall: every efficiency program is evaluated for impact. Utility representatives state that how to use net-to-gross is not explicit in the law. Whether prescriptive values for net savings are set in advance versus measured retrospectively—through impact evaluation–has important implications for program design. Ameren Illinois has argued that retrospective application of net-to-gross will result in lower savings attribution for their CFL programs.

Funding and Policy Approaches to Achieve Increased Savings

Massive budget increases for energy efficiency programs have paved the way for comprehensive energy efficiency portfolios to be developed and stepped-up annual energy savings goals to be realized. Funding for electric efficiency programs shot up from less than one million in 2007 to $89.9 million in 2009 and then to $107.4 million for 2010. Natural gas efficiency budgets went from zero in 2007 to over $4 million in 2009.

Table 26: Electric Energy Efficiency Spending

2006	2007	2008	2009	2010 (budget)
$3,222	$829	$8,818	$89,900	$107,400

ComEd alone reported spending $37 million on efficiency in 2009; their budget for 2010 more than doubled, to $81.8 million. Of that, $18.2 million was for general portfolio costs, such as education, administration, R&D, and on-line tools.

The Illinois Energy Efficiency Stakeholder Advisory Group (ILSAG) was established by the Illinois Commerce Commission to review progress toward achieving the electric energy efficiency goals and to strengthen the large-utility efficiency program portfolios (ComEd, Ameren Illinois) and IDCEO's portfolio. Several major environmental and consumer groups meet along with state and utility representatives. ILSAG is highly regarded as a very good stakeholder group engaging in healthy dialog each month and having a lot of positives in the structure.

Administrative and Program Strategies to Achieve Increased Energy Savings

ComEd acquires more than 70% of their electric savings from lighting programs. This portfolio design was a response to the combined effect of the policy requirement placed on them, to develop and expand energy saved rapidly, cost-effectively, and within the cost cap. They are doing a pilot program for midstream CFL rebates, increasing market segmentation to add in nontraditional segments, and adding in program elements such as commercial real estate. A ComEd cross-cutting effort to obtain higher energy savings is underway to clean their project tracking and reporting data to improve data management.

For residential programs, early evaluation of the air conditioning measures included in their programs were deemed to save significantly less savings than planned due to the Illinois climate and the discretionary nature of customer cooling habits. ComEd has struggled to find measures that meet the cost-effectiveness test. They are exploring new measures and incentives mechanisms such an HVAC equipment early retirement, and customer based incentive features. The largest and most successful program is ENERGY STAR Lighting, which has been providing nine million bulbs per year. Since June, 2010, ComEd has been doing joint residential pilot programs with the gas utilities as an addition to their residential direct install programs. Multifamily has been up and running and they have completed 15,000 units. ComEd plans to complete another 15,000 units of multi-family direct installations by June, 2011. Similarly, single family retrofits are highlighting the cost effectiveness issue with insulation measures for reducing cooling costs (electric avoided costs). For avoided air conditioning energy use, the cost of saved energy could approach a $1 per kWh, which is almost 4 times the average cost per kWh for their portfolio. Given that the potential savings from these retrofit-type programs are in heating (which is mostly provided by natural gas systems), ComEd is working closely with the gas IOUs to deliver these programs jointly and to allocate program costs equitably.

Ameren Illinois does more Home Performance with ENERGY STAR projects in proportion to their size compared with ComEd because they provide both natural gas and electric services to their customers. 40% of Ameren Illinois's customers are in the St. Louis area where electric space heat, air conditioning, and electric heat pumps are more prevalent, which acts to reduce the cost-effectiveness of single family retrofits. According to the Illinois Power Agency Act, savings counted toward the EEPS goals are first year savings, not lifetime savings, which gives utilities an incentive to design their energy efficiency portfolios and programs to maximize short-term savings rather than overall savings.

Ameren Illinois also has a major emphasis on lighting programs, although they have significantly decreased plans for CFLs from 3 million to 500,000 due to how kWh savings are attributed. Ameren Illinois does not have a stipulation with the ICC to make adjustments to attribution, and CFLs savings are not deemed to be a set amount of kWh per bulb in advance. Instead of including the additional CFLs in their program plans, they are shifting more program resources to provide upstream rebates for high performance T-8 bulbs and high efficiency motors for commercial and industrial customers.

Early Results, Responses, and Outlook

Results to date among the major program administrators in Illinois have been mixed.

Table 27: Illinois Electric Efficiency Savings 2008-2010

Utility	2008-2009 (PY 1) Requirement (MWh)	2009 Achieved (MWh)	Percent Attained	2009-2010 (PY 2) Requirement (MWh)	2010 Achieved (MWh)	Percent Attained
ComEd	148,842	**163,717**	110%	315,223	**456,151**	145%
Ameren Illinois	62,808	**89,955**	143%	118,288	**142,995**	121%
DCEO	54,572	**27,285**	50%	110,715	**72,331**	65%

Sources: ComEd Year 1 Evaluation Report; ComEd Year 2 Evaluation Report; Ameren Illinois Year 1 Annual Report; Ameren Illinois Final PY2 Monthly Report September 2010; DCEO Program Year 2 Evaluation

ComEd savings in Year 3 have not materialized easily, which represents a major change from the first year, which was oversubscribed and under-funded to meet pent-up demand for energy-efficiency program services. Average business sector project size has been shrinking, from $16,000 to $9,000 and then to $5,000 in spite of incentive budgets increasing every year. In response, ComEd has been increasing incentives for replacing T-12 bulbs with high performance T-8 bulbs, for occupancy sensors, and for de-lamping T-12 fixtures from 3-lamp to 2-lamp. They have also increased bonuses to contractors for larger projects and taken out full-page print advertisements in trade publications to promote programs to contractors.

Ameren Illinois has been meeting their goals so far, exceeding the Year 1 goal of 0.2%, meeting the Year 2 goal of 0.4%, and on track to surpass the goal of 0.6% in Year 3. They attribute the savings increases to the economic rebound, to incentives paid to the community of energy efficiency contractors, and to the success of Building Performance Institute (BPI) training in increasing the number of certified contractors eligible to participate in the programs. Previously there had only been nine qualified contractors available over a service territory of 44,000 square miles.

IDCEO did not meet their savings goals, which were triple the percentage of the utilities in the first year, at 0.6% compared with 0.2%. There have been several forces working against realizing savings goals. These included the overall lagging effects of the economy and the recession's effect on government and school budgets; a prior agreement that market transformation activities such as training for contractors and technical assistance did not count for any savings during the first three years; and public entities that are IDCEO's efficiency customers also require substantial technical assistance with completing paperwork which increases the administrative costs of running the programs. Another important issue for IDCEO is that the independent evaluation companies use the same methods to attribute savings for government agencies as for investor-owned utilities. The resulting blended realization rate/net-to-gross ratio for IDCEO electric energy efficiency programs was 36%. Of particular concern is that the baseline energy efficiency is too restrictive. For example, a state correctional facility may be 20 years beyond its estimated useful life, and only a fraction of the actual energy savings for appliances, motors, and other measures are credited to the program. Yet another impediment to increased savings has been the impact of federal energy efficiency funds used by municipalities, which supplanted, rather than supplemented the state government programs.

In response to these challenges, IDCEO has adopted some new approaches. They have hired more contractors to assist government agency customers with paperwork and moving through the process. They are doing more direct partnering, such as with the Community Colleges and Illinois Green Economy Network, who administer a technical assistance program. IDCEO is also working directly with the State Board of Education to promote IDCEO energy efficiency programs, and with Regional Planning Agencies who are helping to administer Energy Efficiency Community Block Grants (EECBG).

ComEd continues to find great potential in lighting-oriented programs to get savings and sees efficiency opportunities persisting in the business sector, such as in warehouses and light manufacturing. Because Chicago has been a freight center for the entire country for a long time, there are many buildings with old, inefficient lights in them. ComEd has 300,000 business customers. For Year 4, ComEd is engaging with more of these businesses to pave the way for increasing participation in large custom programs such as high speed drives and HVAC, which will be a major focus as the percentage savings available from lighting opportunities diminishes overall.

Prognosis

All the major program administrators agree that when the spending caps are reached, the annual savings goals will not be met. The spending limit stays fixed after it reaches 2%, but the MWh requirements increase. In the long term, all the program administrators agree that new funding will be required and that there will be an effort to raise the spending limits. Environmental and consumer stakeholders assert that annual savings above 1% can be reached and sustained statewide and they want to increase the rate cap as well. There are still funds for natural gas efficiency available from Year 1 which stakeholders advocate using. The focus is on the first three years—one utility representative shared that Year 4 was the farthest into the future for which they have discussed plans.

Michigan

Background

Under a progressive Republican Governor in the late 1970s, Michigan became one of the first states to initiate utility energy "conservation" programs (as they were then referred to) in response to the natural gas crisis. By the mid-1990s, Michigan had substantial utility energy efficiency programs, with electric utilities reporting a cumulative annual savings of 770 GWh. In 1995, under a conservative governor,

demand-side management and integrated resource planning were discontinued during the move toward electric restructuring. That remained the situation until 2008.

The largest electric utilities are Detroit Edison, owned by DTE Energy, and Consumers Energy, making up over 80% of the retail electric sales. Consumers Energy is also one of the largest natural gas utilities. With Michigan Consolidated Gas Company (MichCon), owned by DTE Energy, they provide the majority of gas service in the state. SEMCO Energy Gas Company and Michigan Gas Utilities Corporation serve almost all of the remaining 15% of gas customers. Including smaller investor owned utilities, electric cooperatives, and publicly owned utilities, there are 66 utilities in Michigan.

In 2006 and 2007, Michigan electric utilities did not report any savings to the Energy Information Administration. In 2007 there was no reported spending on electric or natural gas efficiency programs.

Michigan's Energy Efficiency Portfolio Standard Policy

This changed beginning in October 2008, when the Clean, Efficient, and Renewable Energy Act was signed into law, requiring all types of electric and natural gas utilities to provide "Energy Optimization Programs". Electric utilities were mandated to achieve 0.3% savings in 2009; 0.5% in 2010; 0.75% in 2011; and 1.0% in 2012 and each year thereafter. Percentages are savings relative to the prior year's total retail electricity sales. Natural gas utilities must achieve 0.1% savings in 2009; 0.25% in 2010; 0.5% in 2011; and 0.75% in 2012 and each year thereafter. Percentages are of the prior year's total annual retail natural gas sales in decatherms or equivalent MCFs. For the first triennial cycle, the Michigan Public Service Commission (MPSC) projected electric energy savings targets to be[63]:

2009	0.3%	326,056 MWh
2010	0.5%	502,797 MWh
2011	0.75%	742,451 MWh
Total	1.55%	1,551,317 MWh

Regulated investor-owned utilities are responsible for 88.9 percent of the statewide electric savings targets; municipal utilities represent 7.8 percent of savings; and electric cooperatives, 3.4 percent. Most efficiency programs are administered by the utilities, although some fund a state program. The utilities contract out program implementation. Large electric customers, as determined by their peak use, may administer their own programs.

Another provision of the Act requires the MPSC to submit reports annually each November to the standing energy- and environment-related committees of state house and senate on efforts to "implement energy conservation and energy efficiency programs or measures." At the same time the EEPS was passed, the state legislature also enacted HB 5524, which created, and mandated that utilities participate in, an Integrated Resource Planning process.

There are limits to how much each utility many collect and spend on energy efficiency programs. In 2011, that spending cap is 1.5% of total retail sales revenues for 2009. In 2012 and thereafter, the spending cap is 2.0% of the total retail sales revenues for the two years preceding.

All 66 utilities propose Energy Optimization Plans to the MPSC. To approve a plan, the Commission must determine that the plan is cost-effective and is reasonable and prudent. Cost-effectiveness is measured by the results of the Utility Cost Test ("UCT").

A utility's compliance with the EEPS is based on verified gross savings for the first two years the EEPS is in effect. For the third year, the MPSC regulations require that net savings as determined by an independent third-party evaluation consultant though an impact evaluation must be used.

[63] Report on the Implementation of P.A. 295 Utility Energy Optimization Programs, Revised January 2011. Michigan Public Service Commission. Page 8. http://www.michigan.gov/documents/mpsc/eo_legislature_report2010_339568_7.pdf

The policy framework is structured to remove barriers to and motivate utilities to achieve successful programs through provisions that authorize decoupling and shareholder incentives.

Decoupling
The EEPS statute mandates that the Commission consider decoupling mechanisms proposed by the state's electric utilities. Consumers Energy has included a decoupling proposal in a rate case currently before the Commission (U-15768). Detroit Edison's proposal for a revenue decoupling mechanism was approved by the Commission in January 2010 (U-15751). The Act also authorized natural gas decoupling, which has been implemented in a series of Commission orders. The Commission has approved natural gas decoupling for Michigan Consolidated Gas Company (Docket No. U-15985), for Consumers Energy (Docket No.U-15986), and for Michigan Gas Utilities (U-15990).

Shareholder Incentives
The law also contains two provisions whereby utilities can receive an economic incentive for implementing energy efficiency programs. First, they are allowed to request that energy efficiency program costs be capitalized and earn a normal rate of return. Second, they are allowed to request a performance incentive for shareholders if the utilities exceed the annual energy savings target. Performance incentives cannot exceed 15% of the total cost of the energy efficiency programs. The Commission has approved performance incentives for DTE Energy, which follows the 15% cap authorized in PA 295 (U-15806).

Funding and Policy Approaches to Achieve Increased Savings

In June, 2009, under Orders from the Commission (in cases U-15805 and U-15806), the MPSC staff started a statewide Energy Optimization Collaborative with the mandatory participation of all gas and electric providers. The purpose of the Collaborative is to review and improve Energy Optimization plans to maximize their effectiveness. A variety of other stakeholders were invited to join, and the order stated that energy efficiency experts, equipment installers, and other interested stakeholders should be encouraged to participate. The same day, DTE Energy announced their comprehensive gas and electric program offerings under the Your Energy Savings brand.

Planning, designing and launching efficiency programs as quickly as possible has been a major consideration for utilities as they had a matter of months from the MPSC Energy Optimization Plan Order to begin. DTE was launching programs within six month of when they filed their plan with MPSC.

Funding for gas and electric utility energy efficiency programs has exploded since the passage of the EEPS from nothing in 2007, to $14 million spent in 2008, over $80 million budgeted for 2009, as reported to the Consortium for Energy Efficiency and the Energy Information Administration. By 2012, approved Energy Optimization plans for DTE Energy, Consumers Energy, and MichCon, spending reaches $220 million per year—the maximum allowed—and stays there for the next three years.

Consumer's Energy has been using a policy provision in the EEPS that allows for funding of up to 5% of a utility's energy optimization budget for pilot projects, which gives them the freedom to explore new technologies and delivery approaches with less risk. They are starting to consider working with OPower to provide energy use comparisons for residential customers, for example. Also, for business customers, they are looking at new technologies and programs that have energy saving potential, such as Building Operator Certification (BOC) training for facility managers and a business new construction pilot. A Consumers Energy representative also cited the Energy Optimization Collaborative as a resource for program implementation and design assistance, providing design improvements in addition to those suggested by trade allies. The environmental agencies also provide feedback and have new ideas.

Detroit Edison proposed joint administration of their electric efficiency programs with the Michigan Consolidated Gas Company's natural gas efficiency programs by establishing a combined organization to administer both.

Administrative and Program Strategies to Achieve Increased Energy Savings

In 2009-2010 the utilities stuck to the low-hanging fruit, with lighting programs getting the most emphasis, although there has been some concern about meeting goals in the future with continued reliance on lighting. At the broadest level, one idea that has been considered is the whole-house approach, and a PSC representative related that the utilities are discussing using a holistic approach to commercial efficiency programs as well. On the gas side, there has been more focus on replacing equipment such as furnaces. Gas utilities were not as concerned about meeting savings goals, which were very low in the first years. However, because appliance standards are increasing while annual energy savings requirements are going up, compliance with the EEPS goals will become more challenging in the next few years.

Detroit Edison's approved EO plan holds the allocation of funds constant sectors through 2015, at 45% commercial and industrial and 55% residential.

Consumers Energy efficiency program objectives have not been limited to obtaining MWh and therm savings goals directly. Their aims have been to provide "tried-and-true" programs that provide participation opportunities for all customers, to maximize coordination with other companies, and to invest in Michigan and grow the economy. Consumers Energy continues to employ efficiency program staff with experience from 15 years ago when the utility offered programs, many of whom were selected to work on the current programs. This provides a big advantage because they have a basic experience base with the successful program model used in the early 1990's, with a definite focus on training and working with their trade allies.

Consumers Energy's main portfolio design strategy was to feature programs that had been proven in other jurisdictions, working with contractors to help to develop those programs, and carefully selecting only contractors with established procedures in place, experience with both planning and implementation, and who were effective in duplicating successful program models from other states into Consumers Energy's service territory. The design team included Summit Blue and the Wisconsin Energy Conservation Corporation (WECC). These two companies provided a blend of practical implementation experience (WECC) and theoretical, planning and modeling experience (Summit Blue).

They are coordinating, to the extent possible, with other programs offered around the state. Early on Consumers Energy met with DTE and the Lansing Board of Water and Light. In 2010 they did a joint thermostat installation program with the Board of Water and Light. Both companies split the cost for the installation contractor. Consumers Energy claimed the gas savings and BWL took the electric. In 2011, Consumers Energy will be looking at how to go into a customer's premise and effectively offer joint services. So when a consumer receives electric and gas from different companies they can optimize both companies' efforts.

Consumers Energy's primary residential and business programs demonstrate their focus on proven program approaches.

<u>Residential Programs and Approaches</u>

Upstream Lighting—This CFL buy-down program with amounts negotiated up-front with manufacturers and retailers enables customers to get an "instant rebate" at point-of-purchase and only pay $0.99 per bulb.

Furnace and Central Air Conditioning Rebate—Consumers Energy and their implementation contractors developed a list of trade allies and provided a general training session on the about the programs and how to assist their customers to complete applications. In 2009, our HVAC program had very high participation rates. HVAC trade allies had been experiencing reduced demand for their services due to the recession and were very motivated to participate.

Multifamily Direct Install—Direct installation of energy efficiency measures provides a higher level of certainty that energy savings will be achieved.

Appliance Recycling—After an initial pilot program in a limited area demonstrated its effectiveness, Appliance Recycling was successfully rolled out statewide.

Income-qualified Weatherization—Initially Consumers Energy established a working relationship with the Michigan Community Action Agencies (MCAA) to implement the program, however, because of the time it took to gain alignment and operational efficiencies, some areas of the state were assigned to a different contractor team.

Business Programs and Approaches

Consumers Energy worked closely with trade allies, especially with the lighting and HVAC rebate programs, to provide them with efficiency program knowledge to support and leverage their marketing efforts. One of the stated goals of PA 295 was economic development. Programs were designed to support the trade allies instead of competing with them. As with the residential trade allies, training sessions were provided about the energy efficiency programs. Many of the rebated program measures are purchased at the time of replacement—the trade allies are there with the customers when the measures need to be replaced, but program administrators are not.

Business programs are focused on lighting, primarily because the fast payback on lighting efficiency measures is important to business customers, the lighting trade allies are very active, and there is savings potential in energy efficiency lighting opportunities.

DTE Energy rolled out a fleet of proven residential efficiency programs as well, including ENERGY STAR CFL lighting programs through large retailers, rebates for efficient appliances, home weatherization with incentives up to $1300 per home, incentives for home energy audits, residential direct install, online audit, and others. DTE Energy offered an HVAC program at the end of 2009 and the beginning of 2010 that was wildly successful due in part to contractors' aggressive sales of efficient furnaces. This was launched again in November, 2010.

DTE is also partnering with Masco to run a turn-key program offering "whole home" project rebates. An audit is done and then auditor shows customer paybacks for doing the measures. Customers are seeing 20%-25% modeled energy savings. However, the rate of adoption is not high because the financial commitment is high, and the customer must do at least two of the suggested measures.

DTE energy has also been adding programs on the business side targeting particular markets and market segments. Late last year they piloted a program with small grocery stores in Detroit, in which they did audits and identified measures that were specific to the grocery industry and set up special incentives for them. It was very popular and the funding for these customized incentives ran out in one month. Now they are focusing on hotels and other segments and offering incentives specific to those industries.

Early Results, Responses, and Outlook

Consumers Energy has been surpassing their energy savings goals for both natural gas efficiency program and electric programs. In 2009 their electric target was 108 GWh, and they delivered savings of over 145 GWh. The 2009 natural gas savings goal was 299,623 MCF and their combined program savings was 396,783 MCF.

In 2009 DTE exceeded electric savings requirement of 160 GWh by 39%, saving 203 GWh. Most of the variance from plan was their ENERGY STAR Products Program, which makes up the largest fraction of total savings of any program. The second largest program in terms of savings was C&I Prescriptive.

According to an MPSC representative, in 2011 there will be more focus on the industrial sector. The utilities reported high participation and energy savings in commercial programs, which ran out of funding

in June 2010, especially commercial lighting. Some of the utilities had to decrease their rebates because they were so popular. The current emphasis is on reaching more customers with current programs rather than trying new technologies to get deeper savings, although in the future they are hoping a whole-house approach will replace some of the savings lighting programs are capturing now. Consumers Energy filed an amended Energy Optimization Plan for 2011-2014.

One future direction DTE Energy has begun moving in is an emphasis on customer behavior. They will be piloting a behavior-change program contracting with the OPower company in 2011. OPower has been sweeping across the country. The firm sends customers a two-page letter comparing customer energy use with their neighbors. This gives homeowners a basis of comparison on their energy use. DTE Energy believes that OPower's track record of savings is as much as 2 to 3 % savings relative to a control group. DTE will be ramping up the scale of this program in 2012.

Prognosis

Detroit Edison and MichCon both expect to be— and have MPSC-approved Energy Optimization Plans for—exceeding EEPS savings levels every year through 2015. Energy savings were 140% of the goal in 2009 and are expected to be even higher for 2010. DTE Energy is exceeding their goals in order to get the maximum amount of recovery costs that are allowed. In the future, as there are less savings to acquire, they anticipate that it will get harder and harder to meet savings goals within the cost recovery limit.

Consumers Energy savings levels will be sustained into the future. They anticipate over the long term that they will need to go to the next tier after they get the low hanging fruit.

Ohio

Background

Ohio electric utilities provided extensive energy efficiency programs to their customers during the 1990's, saving a cumulative annual 1,198 GWh by 1996, the fourteenth highest among all states (York & Kushler 2002). In 1999, Ohio restructured their electric markets, beginning with Spending and energy savings declined over the next thirteen years as there was relatively little efficiency program activity. Ohio natural gas utilities also run efficiency programs, but there is no natural gas efficiency portfolio standard. One electric efficiency initiative that continued was the state-administered Energy Efficiency Revolving Loan Fund, part of the ratepayer-funded Advanced Energy Fund, which was instituted in 1999. A universal service rider, a type of surcharge, supports the Ohio Energy Loan Fund, providing low income bill assistance and efficiency incentives. The charge is $0.0001758 per kWh or approximately $15 million per year.

Ohio's largest electric utility is First Energy, with 1.8 million customers in Ohio served by three operating companies: Ohio Edison, Toledo Edison, and the Illuminating Company. Second is American Electric Power of Ohio (AEP OH), with 1.5 million customers served by two operating companies: the Columbus Southern Power Company and the Ohio Power Company. Duke Energy Ohio and Dayton Power & Light Company (DP&L) both have over a half-million customers. These four investor-owned utilities sell almost 90% of all retail electricity in the state.

The distribution utilities administer their own energy efficiency programs with oversight from the Public Utilities Commission of Ohio (PUCO). The PUCO may also modify the utilities' proposed programs. Ohio's investor-owned utilities are required to prepare and implement energy efficiency plans. On April 15 of each year, each electric utility must file its long-term forecast and benchmark report regarding compliance with baselines and benchmarks for energy efficiency and peak reduction programs with the Commission.

Ohio's Energy Efficiency Resource Standard Policy

Senate Bill 221, signed into law May 1, 2008, included both an Energy Efficiency Portfolio Standard (EEPS), and Alternative Energy Portfolio Standard (RPS), among other provisions. For efficiency, it requires a gradual ramp up to a cumulative 22 percent reduction in electricity use by 2025. Beginning in 2009, the Act requires electric distribution utilities to implement energy efficiency programs that achieve energy savings equal to at least three-tenths of one per cent of sales. The annual savings requirements increase to an additional five-tenths of one per cent in 2010, seven-tenths of one per cent in 2011, eight-tenths of one per cent in 2012, nine-tenths of one per cent in 2013, one per cent from 2014 to 2018, and two per cent each year thereafter, achieving a cumulative energy savings in excess of twenty-two per cent by the end of 2025.

Table 28: Ohio Percent Energy Savings Requirements by Year, 2009-2009

2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020-25
0.30%	0.50%	0.70%	0.80%	0.90%	1.00%	1.00%	1.00%	1.00%	1.00%	2.00%	2.00%

Sales are defined as the normalized annual average kilowatt-hour sales of the utility for the preceding three calendar years to their Ohio customers.

All surplus energy savings may be banked and used to meet future energy efficiency or advanced energy benchmarks. The utilities are responsible to meet their share of the overall statewide goal, however, they may include savings from their large industrial ("mercantile") customers in their proposed plan filings to PUCO. The issue of mercantile savings approval by the PUCO has received substantial attention, and has engendered some controversy, among environmental stakeholders in particular. One major concern is that the inclusion of energy savings from the past has no additive value and directly displaces new efficiency.

Penalty and Off-Ramp

Failure to comply with energy efficiency savings requirements will result in forfeiture by the utility. The amount is either that prescribed by the legislature or the existing market value of one renewable energy credit per MWh of undercompliance or noncompliance. Any revenue from forfeiture is credited to the Advanced Energy Fund. The commission may amend the benchmarks if, after application by the electric distribution utility, the commission determines that the utility cannot reasonably achieve the benchmarks due to regulatory, economic, or technological reasons beyond its reasonable control.

Funding and Policy Approaches to Achieve Increased Savings

Ohio's EEPS mandates a level of savings by the third year (0.6%) that other Midwestern states who are among the national leaders in utility efficiency, with populations and electricity use half the size, took twice as long or longer to reach. Rapid acceleration in program budgets is one way Ohio has been priming the pump and making possible the development of the necessary efficiency infrastructure. Ohio's electric utilities increased their collective budgets for energy efficiency programs from approximately $20 million per year between 2006 and 2008 to $152.8 million in 2010, according to the Consortium for Energy Efficiency[64].

Shareholder incentives and decoupling are two policy approaches supporting utility efforts to capture increasing annual savings.

Shareholder Incentives

Financial incentives to utilities for achieving energy savings may be approved by PUCO on a case-by-case basis. First Energy and AEP have had performance incentives approved. Duke Energy was recently approved for incentives as part of the regulatory approval of more than a dozen residential and commercial demand side management programs and related cost recovery. The recovery mechanism is

[64] Consortium for Energy Efficiency, 2010 Annual Industry Report, State and Provincial Tables. http://www.cee1.org/ee-pe/docs/Table%204.pdf

an annually reconciled rider, which includes conditioned adjustments for shared savings with a maximum 10% shareholder incentive if at least 65% of targeted savings are achieved.

Decoupling
In the Public Utilities Commission of Ohio's (PUCO) rules, the commission may provide for decoupling, and an electric distribution utility may submit an application for approval of a revenue decoupling mechanism to the PUCO. Lost revenue recovery mechanisms for electric and gas utilities are determined on a case-by-case basis. All of Ohio's electric utilities recover program costs. Duke recovers lost revenues resulting from their portfolios of energy efficiency programs via the DSM rider. Dayton Power & Light had their electric security plan approved by PUCO, which extends their existing generation rate plan through Dec. 31, 2012. Rule: ORC §4928.143(B)(2)(h); Duke riders: Docket Nos. 06-0091-EL-UNC, 06-0092-EL-UNC, and 06-0093-GA-UNC

DP&L's original plan filing was designed to be rolled out in conjunction with smart grid deployment and it included a ten-year plan for energy efficiency. However, smart grid is not moving ahead in Ohio. PUCO approved DP&L's Electric Security Plan[65], which includes efficiency program plans, on June 24, 2009. It will run through Dec. 31, 2012. One area that DP&L is looking to find savings is utility system voltage upgrades, which will reduce line losses and are accounted for as energy savings according to the EEPS. The savings achieved will be established using engineering calculations. AEP's initial electric security plan also provided for the implementation of their gridSMART program, which was intended to enable customers to control their electric use using advanced metering technology.

Program evaluation is conducted with a high proportion of measures given deemed savings values, which decreases the administrative cost of impact evaluations. Evaluations are performed program-by-program by independent third-party contractors. Utilities file compliance reports to PUCO annually. For purposes of the EEPS, gross savings are used.

Collaboratives/stakeholder engagement are encouraged but not mandated in the PUCO efficiency rules.

Administrative and Program Strategies to Achieve Increased Energy Savings

Three of the four major IOUs began their efficiency initiatives under the EEPS with portfolios of predominantly tried-and-true energy efficiency programs. At DP&L, during the initial phase of the EEPS they are implementing a series of traditional energy efficiency programs, heavily emphasizing lighting. In their initial seven-year (2008-2015) plan proposal, 75% of residential savings were from CFLs. The majority of energy savings for DP&L are in the commercial and industrial sectors, which includes government customers. These business programs offer prescriptive rebates for over 100 measures including motors, HVAC equipment, and air compressors and were introduced in the spring of 2009 when the EEPS went into effect. The project planning cycle is much longer for program managers in the business sector as it takes time and effort to build relationships with contractors. For residential, programs include an upstream CFL buydown, appliance rebates, rebates and tune-ups for electric furnaces, low income programs, and a school-based educational program delivered and facilitated by the Ohio Energy Project called E-3. The E-3 programs does provide energy savings DP&L can get credit for, but the intent is to have a broader impact.

AEP began implementing programs in mid-2009, also filing their Energy Security Plan with traditional programs. The subsidiaries filed efficiency portfolio plans to PUCO as one plan that was the result of a long process in which they hired a contractor to conduct an energy efficiency potential study, started a multi-stakeholder collaborative, investigated best practices, and then put together a suite of new programs. (See testimony in cases 09-1089 in DIS and 09-1090). One major energy-saving effort was a very large CFL markdown program, for 1.8 million light bulbs in 2009 and then 3.8 million

[65] Dayton Power & Light, Energy Efficiency and Demand Response Plan
http://www.dpandl.com/documents/EnergyEfficiencyandDemandResponsePlan.pdf

Duke's portfolio of programs that was approved by PUCO as part of their 2008 three-year filing emphasizes lighting. Since the passage of the federal Energy Policy Act of 2005, Duke Energy Ohio has been speeding up their timeline for gaining savings from CFLs on the residential side and lighting options for commercial and industrial customers as well. The upcoming federal changes will also impact businesses as well, because the increased efficiency standard will reduce the amount of savings per lamp that utility program administrators may claim. As LED lighting is not yet cost effective under Ohio cost-effectiveness tests, in 2012 Duke may use an early replacement CFL program—to get residential customers to install the bulbs they have already bought—in order to be able to count the savings toward their EEPS targets. Another significant technology category in 2010 was HVAC, which had benefited from the combination of Duke rebates and federal tax credits, providing a stronger incentive for customers to install high-efficiency equipment.

Duke is not currently offering additional incentives to customers for installing multiple measures per project. Instead, they are emphasizing broad participation rather than deep savings per customer, in part, at least, to capture as much lighting savings as possible before federal standards take full effect and have there full impact. This is also partially due to the fact that cost effectiveness is determined at the measure level, so less cost-effective end use technologies, even if they add an increment of savings to a project, it may be screened out and not meet the test. To increase more customers, they are learning how to best utilize different communication methods including online channels, integrated voice recognition phone systems, mailers, and business reply cards.

Duke is moving more and more toward a behavioral approach with customers, although the persistence of energy savings achieved is an issue. For example, they are doing a pilot project for home energy comparison reports, which enables homeowners to see whether they are using more energy than their neighbors or less energy.

Early Results, Responses, and Outlook

PUCO had not approved energy efficiency program plans filed by FirstEnergy Corporation until March, 2011. The three other IOUs met their savings targets of 0.3% for 2009 and 0.5% for 2010. To meet the statewide goal in the future, savings from FirstEnergy will be needed. FirstEnergy's plan would have contributed 151,829 MWh for 2010; that figure increases to 432,993 for the year 2012.

Table 29: Energy Efficiency Performance by Utility in 2009 and 2010

Utility	2009 Requirement (MWh)	2009 Achieved (MWh)	Percent Attained	2010 Requirement (MWh)	2010 Achieved (MWh)	Percent Attained
American Electric Power[66]	136,944	**171,000**	125%	228,125	**306,000**	134%
Dayton Power & Light[67]	43,193	**40,442**	94%	71,781	**101,061**	141%
Duke Energy[68]	68,127	**86,402**	127%	109,420	**310,755**	284%
FirstEnergy[69]	166,310	**22,614**	14%	N/A	N/A	N/A
Total	**414,574**	**320,458**	**77%**	**409,326**	**717,816**	**175%**

AEP has also exceeded savings targets, in part because of their successful commercial and industrial efforts. Ohio allows C&I customers to opt-out of paying the energy efficiency rider is they are able to demonstrate historical energy savings. Qualifying businesses may apply. AEP offered a plan to their large business customers such that the customer continues to stay in the rider, AEP pays 75% of what they would have saved by opting out, and the customer can use that money for efficiency improvements.

[66] Savings calculated on a pro-rated basis. 2009: Docket No. 10-0318-EL-EEC; 2010: 11-1299-EL-EEC
[67] Savings calculated on a pro-rated basis. Docket No. 10-0303-EL-POR; 2010: 11-1276-EL-POR
[68] Calculated as incremental savings. 2009: Docket No. 10-0317-EL-EEC (Appendix A); 2010: 11-1311-EL-EEC
[69] Requirements for 2009 through 2012 waived. 2009 savings achieved filed in Docket No. 10-0277-EL-EEC

The customer receives a lump sum, pays into the rider, and is eligible to participate in AEP's efficiency programs.

Three Ohio IOUs are getting cost recovery. DP&L is also recovering some lost revenues. The rate rider is up for review by March or April, 2011. AEP began implementing some efficiency programs before they were approved by PUCO, so they were not able to recover their program costs until May 2010. Duke has their Save-A-Watt program instead, so they receive a percent of the avoided cost of the energy-savings impacts of their efficiency program portfolio.

DP&L made only minor changes from the first program year to the second. The administration and management of the CFL program was simplified. New programs included a government facility audit program in which DP&L will pay half the cost of a qualified energy audit, and will pay the full cost if efficiency upgrades are made within one year. Another new program added in 2010 was a new construction rebate, integrated with other utilities, sharing construction vendors.

AEP's new home construction energy efficiency program has benefited by improvement in the home construction market overall. They are partnering with Columbia Gas and share the same contractor and coordinate the gas and electric elements of the program. AEP is also doing more and more market segmentation, such as adding programs targeted to agricultural energy customers and to restaurants.

Market Transformation

The utilities efficiency efforts do play important roles in market transformation. However, the Ohio program administrators we spoke with did not place great importance on market transformation because savings are difficult to measure and utilities do not get credit toward their EERS goals for this work. The Ohio regulatory framework does not provide direct financial incentives for utilities to work on market transformation related activities such as codes and standards enforcement.

Prognosis

The efficiency portfolio and program planning cycle is three years. Utilities are now at the start of the process for 2012-14. The reliance on lighting savings will need to diminish after the federal EISA standards come into effect. ACEEE, together with Summit Blue Consulting has recommended five innovative programs be added to lighting and other proven utility programs in our report, "Shaping Ohio's Energy Future: Energy Efficiency Works." These advanced residential and commercial buildings initiatives, manufacturing, rural and agricultural initiatives, and combined heat and power were recommended in conjunction with five complementary policies primarily under the jurisdiction of the state government. Together, these initiatives would achieve about half of the 22% savings required under the EEPS by 2025.

According to AEP, most of the programs they will have in place over the next three year cycle will look very similar to current programs. AEP will be expanding home energy audit efforts and making the audits more extensive, integrate with existing home retrofits, and expand from the current home retrofit pilot with Columbia Gas, as well as work with a third party to do on-bill financing. For 2012 to 2014, AEP will sit down to develop a collaborative approach with Columbia Gas. Commercial retro-commissioning is an area that AEP will look to for substantial savings. In addition, the company wants to find a way for utilities to get a percentage of the energy savings resulting from building codes and appliance standards. Raising the baseline for efficiency standards erodes the savings a utility may claim relative to the savings their programs have achieved between the new efficient equipment and the "as found" level of efficiency.

In the longer term beyond the next 3 to 5 years, they will be looking at industrial long-range planning, continuous improvement, and integrating energy efficiency with industrial process improvement to get more energy savings.

For Duke Energy Ohio, much of their efficiency program outlook depends on changes to codes and standards, and how utilities may or may not get credit for part of the savings due to them. Attribution influences what types of programs they offer, especially when planning 7 or 8 years into the future. Before then, there will be challenges due to the steep growth curve of annual savings requirements. One lesson learned is to allow time for marketing messages to catch on and for programs to be ramped up. The alternatives to emphasizing CFLs to reap quick MWh savings are capital intensive, yet the utilities may only charge avoided costs. To go beyond the more straightforward efficiency measures requires more staff, but there is a lag time to get them hired and trained while developing programs and getting them into the field.

References

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