# Big Savers: Experiences and Recent History of Program Administrators Achieving High Levels of Electric Savings

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**ABSTRACT**

Utility-sector energy efficiency programs have grown substantially in the past decade. According to the most recent ACEEE *State Energy Efficiency Scorecard*, electric-efficiency program investments have increased from approximately $1.5 billion in 2006 to over $5.9 billion in 2014. As savings levels have increased, national leaders in program administration have emerged.

In this report we review annual program performance for 14 leading energy efficiency program administrators. We sought diversity in the selection of program administrators and included administrators of varying service-territory size and geographic location. Among the 14 program administrators we reviewed, none achieved electricity savings of 1.5% of retail electric sales in 2009. By 2014, 8 of the 14 were achieving savings higher than 1.5%, with 4 of the 8 saving more than 2%. The data also show that high savings are sustainable over time. We find that as savings rise, levelized costs of energy efficiency remain relatively flat.

This paper also seeks to identify the drivers of high savings. State or local policy requirements to meet specific energy-efficient savings goals guide all program administrators in this study. The design of the targets and goals vary, but these policies are critical in driving high levels of savings. Finally, this paper includes insights from program managers, noting trends in portfolio design and lessons learned in achieving high levels of electricity savings.

## Introduction

Energy efficiency savings and spending levels have increased substantially since 2005. This trend comes as more states realize the value of energy efficiency as a low-cost resource with multiple benefits. At the same time some in positions of leadership argue that high savings are not achievable in all regions of the country and may not be sustainable even for program administrators that are able to achieve high levels of savings today. In this paper we examine the validity of these claims. The intent of this report is to document and showcase program administrators achieving and sustaining high levels of electric savings. The trends, best practices, and challenges identified in this report are meant to be instructive to utilities across the country ramping up energy efficiency programs.

## Methodology

This study reviews program administrators achieving and sustaining high levels of electricity savings. We focus on a common metric: energy savings as a percentage of retail sales, which is calculated by dividing the incremental first-year energy efficiency savings by the total volume of retail electric sales in a year for a given utility. This metric is widely understood, and is often used by state legislatures or public service commissions to establish energy efficiency resource standards. We sought to include program administrators that have achieved net electric-

savings levels higher than 1.5% of retail sales in the past decade. This threshold of 1.5% is in the top tier of electricity energy-savings results and goals, according to the ACEEE *2015 State Energy Efficiency Scorecard* (Gilleo et al. 2015).

**Data Collection and Selection of Sample**

To determine which program administrators to include in this study, we first reviewed savings data for all states and program administrators reviewed in recent ACEEE research.[1] ACEEE knowledge and prior experience guided the potential list of program administrators for this study. Based on that selection we sent an initial survey to potential participants seeking data on energy savings, program spending, and several other energy efficiency metrics. We used the results of this survey to select the final sample of program administrators for this study.

We collected additional information from program annual reports, evaluations, and plans. We also conducted interviews with program managers to discuss how programs have evolved over time and specific challenges they have faced. The interviews also provided background on major challenges and opportunities that have shaped efficiency portfolios, and areas that program administrators plan to target in future years.

The initial scope of this project was to focus on program administrators achieving net savings levels higher than 1.5% of retail sales in recent years. However, we have included several program administrators that have not met this threshold. These large utilities, including Commonwealth Edison (ComEd), Pacific Gas and Electric (PG&E), and Southern California Edison (SCE), are considered leaders in program implementation and have much to offer in terms of insight on achieving high savings levels in large service territories. All have also dealt with unique constraints, including a spending cap in the case of ComEd and restrictions in counting energy savings for PG&E and SCE. Otter Tail Power and Northern States Power Company are also included in our sample but did not achieve net savings of 1.5%. We highlight these utilities to show the possibility of achieving high savings levels in various regions. It is also important to note that all five of these utilities achieved gross savings of at least 1.5%. While we focus on net savings in this report, both net and gross savings are useful metrics.[2]

Our group of program administrators is not a complete census of all administrators with high savings from energy efficiency, nor should it be considered a statistically representative sample. Rather we sought to include an illustrative range of geographic locations, regulatory structures, energy costs, state policies, and customer counts.

[1] This research includes the ACEEE *2015 State Scorecard* (Gilleo et al. 2015), the ACEEE *2015 City Scorecard* (Ribeiro et al. 2015), *Municipal Utility Energy Efficiency: Successful Examples around the Nation* (Kushler et al. 2015), *The Best Value for America's Energy Dollar: A National Review of the Cost of Utility Energy Efficiency Programs* (Molina 2014), and others.

[2] *Net savings* are defined as the "changes in energy use attributable to a particular energy efficiency program; these changes may implicitly or explicitly include the effects of factors such as freeridership, participant and non-participant spillover, and induced market effects." *Gross energy savings impacts* are "changes in energy consumption that result directly from program-related actions taken by participants in an energy efficiency program, regardless of why they participated" (NREL 2013). We chose to focus on net energy savings for this report because they have a wider use for setting energy-savings goals and tracking savings achievements.

## Data Assumptions, Caveats, and Challenges

We report savings at the customer meter, a data point consistent with what most of the program administrators in our sample report. In some cases program administrators report savings at the generator level. In these cases we requested a loss factor, or the electricity lost between the generator and the customer meter (referred to as line losses), to convert generator-level savings to meter-level savings.

Since this report focuses on utilities achieving high levels of electric savings, we sought to include only costs and energy savings associated with energy efficiency programs. We do not include costs and savings associated with demand response programs or renewable energy, but do include savings for combined heat and power (CHP).

We encountered several challenges in creating a uniform data set. Program administrators report energy efficiency program data in slightly different ways. For example, some report only net savings while others report only gross savings. Some report energy savings at the meter while others report at the generator. Many also do not explicitly state how the data are reported. We mostly resolved these challenges through follow-up questions to program and regulatory-affairs managers. On several occasions utility-provided data did not match publicly available data. This occurred with utility revenues, customer counts, and total retail electricity sales. In these cases we relied on utility-provided data over publicly available data. When utilities reported only gross savings, we adjusted to net savings using a 90% net-to-gross ratio. This assumption is consistent with the adjustment used in the ACEEE *State Scorecard* (Gilleo et al. 2015).

We also relied on retail sales data provided by the program administrator. When these data were unavailable we used retail sales data from the US Energy Information Administration (EIA).[3] Table 1 offers details on each utility profiled including retail sales and customer count data for 2014. In total we collected 107 observations for program portfolio results, where each observation is a program year for 1 program administrator.

Table 1. Program administrators included in study

| Program administrator | State | Type | Retail sales (GWh) (2014) | Customers (2014) | Years of data included in study |
|---|---|---|---|---|---|
| Pacific Gas & Electric | CA | IOU - Bundled | 86,872 | 5,339,264 | 2006–14 |
| Southern California Edison | CA | IOU - Bundled | 87,417 | 4,993,448 | 2007–14 |
| Commonwealth Edison | IL | IOU - Distribution | 88,581 | 3,864,059 | 2008–14 |
| Energy Trust of Oregon[1] | OR | Third party | 32,404 | 1,403,201 | 2005–14 |
| Eversource[2] | MA | IOU - Distribution | 24,871 | 1,393,499 | 2009–14 |
| National Grid[3] | MA | IOU - Distribution | 21,040 | 1,304,183 | 2009–14 |
| Northern States Power[4] | MN | IOU - Bundled | 30,753 | 1,250,135 | 2010–14 |
| Arizona Public Service | AZ | IOU - Bundled | 27,013 | 1,163,079 | 2008–14 |
| Narragansett Electric[5] | RI | IOU - Distribution | 7,576 | 492,576 | 2007–14 |
| Seattle City Light | WA | Municipal | 9,341 | 415,056 | 2007–14 |

[3] We relied on sales and customer data from the Form EIA-861 (sales to ultimate customers). www.eia.gov/electricity/data/eia861/.

| Program administrator | State | Type | Retail sales (GWh) (2014) | Customers (2014) | Years of data included in study |
|---|---|---|---|---|---|
| Tucson Electric Power | AZ | IOU - Bundled | 9,165 | 414,748 | 2010–14 |
| Efficiency Vermont[6] | VT | Third party | 5,568 | 364,375 | 2005–14 |
| Fort Collins Utilities | CO | Municipal | 1,442 | 70,552 | 2005–14 |
| Otter Tail Power | MN | IOU - Bundled | 2,328 | 60,809 | 2007–14 |

[1] Energy Trust of Oregon serves the electric customers of Pacific Power and Portland General Electric. [2] Eversource Electric includes the Western Massachusetts Electric Company and NSTAR Electric. [3] National Grid Massachusetts includes the Nantucket Electric Company and Massachusetts Electric Company. [4] Northern States Power Company is a wholly owned subsidiary of Xcel Energy. [5] Narragansett Electric Company is a wholly owned subsidiary of National Grid. [6] Efficiency Vermont serves the entire state of Vermont, with the exception of the Burlington Electric Department service territory.

## Quantitative Results of Review

In the following sections we present high-level results of the data collected from the 14 program administrators included in this study. The results focus on energy savings, cost of saved energy, and ramp rates.

### Energy Savings

Figure 1 shows net electric savings as a percentage of retail sales for each utility in our study. Each dot in this figure represents a program year for an individual program administrator.

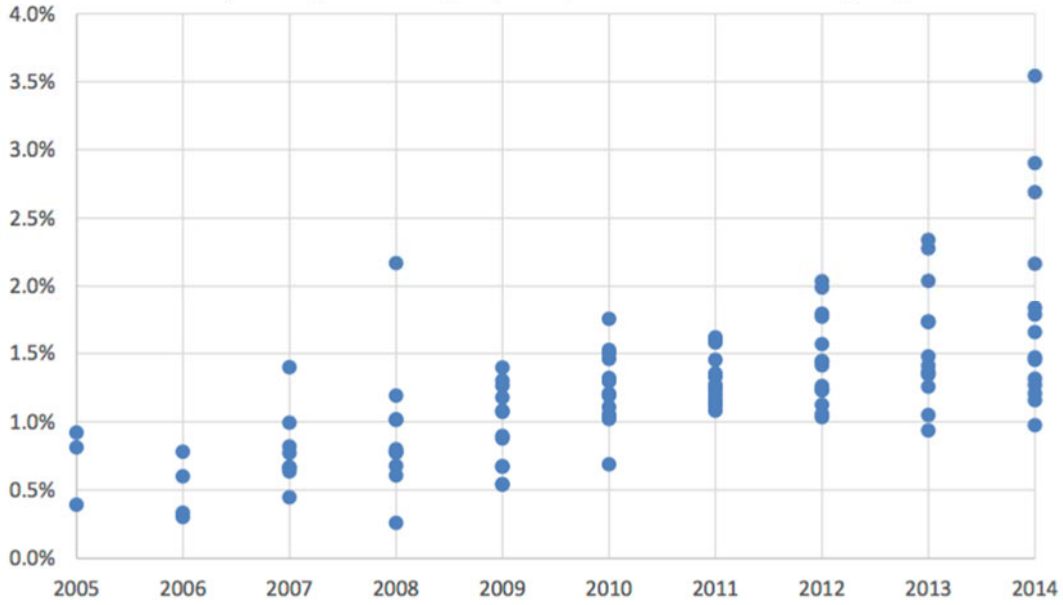


Figure 1. Net electric savings as a percentage of retail electric sales, by year

This figure demonstrates a clear trend of increased savings levels from year to year. Average savings among the program administrators rose from 0.8% in 2007 to 1.8% in 2014. During the period covered in our review, program administrators achieved savings levels over

1.5% in 25 instances, over 2% in 10 instances, and over 3% in 1 instance. The data also show that high savings are sustainable over time. Of the 14 program administrators reviewed, 7 achieved savings levels higher than 1.5% for consecutive years. Three of the seven have sustained this level of savings for more than four years. Thus far, three program administrators achieved savings levels higher than 2% for consecutive program years, with National Grid Massachusetts and Eversource Massachusetts doing so for three consecutive program years (2012–14).

**Ramp Rates**

Figure 2 shows the growth in savings as a percentage of sales for each utility in our sample for 2009 to 2014.

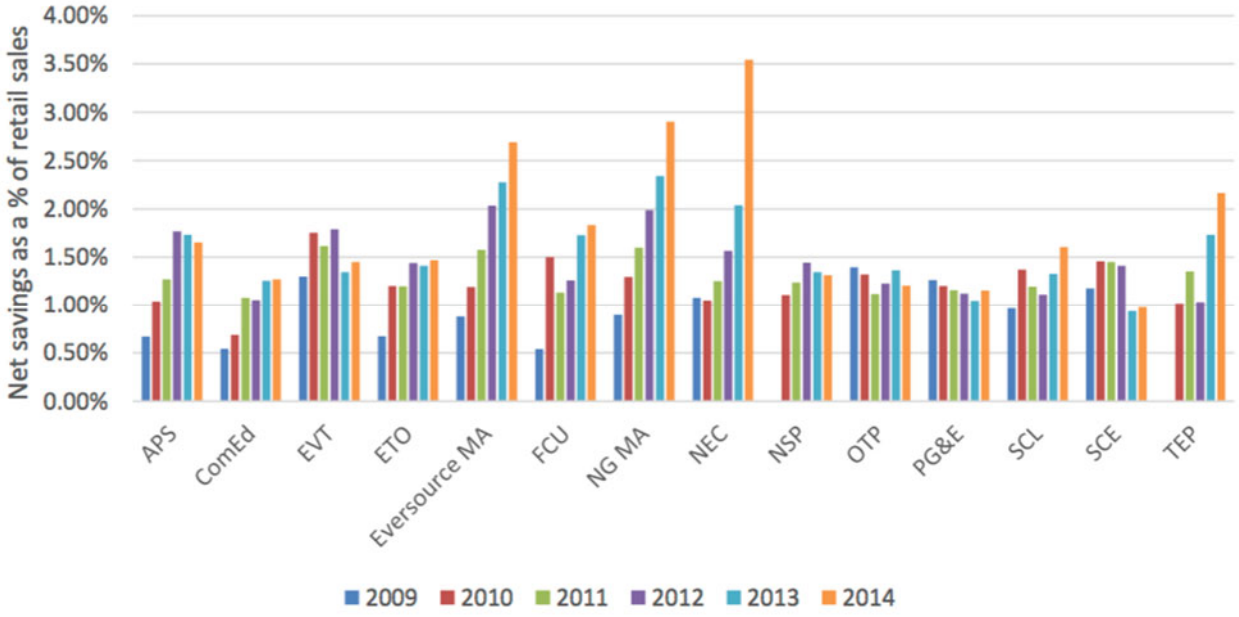


Figure 2. Net energy savings as a percentage of retail electric sales, 2009–14

We use the term *ramp rate* to describe the actual change in savings as a percentage of retail sales from one year to another. For example, if a program administrator saved 1.5% of retail sales in one year and 2% in the next year, the ramp rate would be 0.5%. Our review includes 93 ramp rates at the portfolio level. In general most utilities in our study exhibit the overall trend of increasing savings from year to year. The average ramp rate for our sample at the portfolio level is 0.19%. Of the 93 ramp rates, 44 were above 0.2%. Nearly 20% of the observations were above 0.5%. This means in almost 20% of the program years we reviewed, savings as a percentage of sales increased by 0.5% from one year to the next.

A 2009 ACEEE study reviewed the factors driving large increases in savings from one year to the next (Kushler and Witte 2009). The most significant factors reported in that study include increases in program budgets, a strong state legislative requirement, a supportive regulatory commission, and the implementation of performance incentive structures. These factors are also driving performance for the program administrators in this study. We discuss the policy instruments driving higher savings later in this paper.

There were also instances in which utilities achieved lower savings than the year before. In many instances the declines were very small—less than 0.1%—and reflect natural variation in realized savings from year to year despite steady portfolio savings goals. However in 19 instances we noted decreases in savings of more than 0.1%. We identified two major reasons for these declines.

First, several of these instances occurred immediately following the 2009 recession. In a 2009 report Efficiency Vermont noted that the "fiscal environment had an impact on the work of Efficiency Vermont in both the residential and business customer classes … many consumers chose to defer cost-effective investments, no matter how attractive the long-term economic benefits might be" (Efficiency Vermont 2009). Other program administrators were operating in similar economic conditions, which may explain savings declines in peak recession years.

Second, utility savings may fluctuate based on the program cycle. Many program administrators have three-year cycles, with incentives and goals based on performance over the entirety of the cycle. Program administrators invest in longer-term and perhaps riskier programs early in a cycle.[4] In the final year of a cycle, there is pressure to meet energy-savings targets, particularly for those program administrators whose progress is judged over the entire course of the cycle rather than each year. Utilities reported shifting funds into programs with dependable energy savings—often lighting programs—in order to meet targets. When a new cycle begins the program administrator may see some backsliding in savings as it explores new approaches under less-immediate pressure to meet savings targets.

Despite these occasional ebbs in savings, overall the data illustrate that steady and sometimes aggressive ramp rates and sustained high levels of savings are possible.

## Cost of Saved Energy

In this section we present results for the levelized cost of saved energy (LCSE) for the 14 program administrators in this study. The LCSE is the average annual cost of saved energy for the lifetimes of the measures and programs saving energy. It is often used to compare various options for supply-side resources and can also be useful in comparing supply-side resources with demand-side resources such as energy efficiency. The costs reviewed for this analysis include costs borne by the program administrators such as incentives paid to participants and administration, marketing, and evaluation costs. The program costs also include performance incentives paid to program administrators for achieving specific savings goals, but do not include participant costs.[5] The methodology for this analysis is consistent with prior ACEEE LCSE analyses and with the utility or program administrator cost test (UCT/PACT) (see Molina 2014).

Figure 3 shows the results of this analysis. As the figure demonstrates, the LCSE generally ranges between approximately one and six cents per kilowatt-hour (kWh) at the portfolio level. All costs have been converted to 2014 dollars. The median LCSE for our sample is $0.034 per kWh. These values are consistent with national trends (see Molina 2014 and Billingsley et al. 2014).

[4] A riskier program in this context would be one without a long proven track record of reliable savings or demonstrated adoption. Pilot programs generally fall into this category.

[5] While performance incentives are often paid annually to program administrators, the incentive for Efficiency Vermont is paid at the conclusion of each three-year plan. For Efficiency Vermont, we include the performance incentive in the year it was paid, the final year of each program cycle.

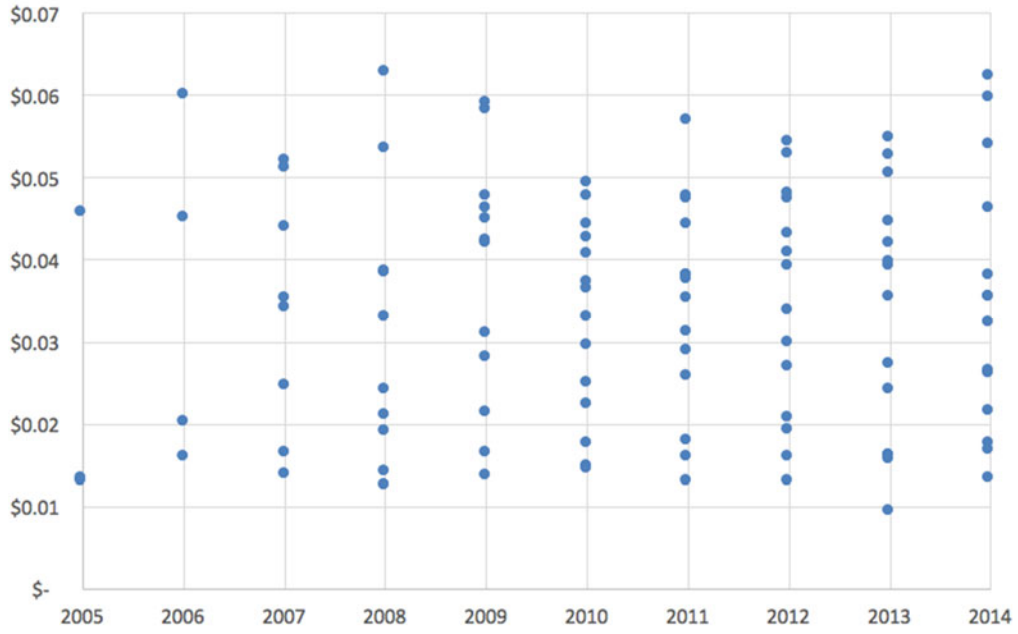


Figure 3. LCSE at portfolio level for 107 portfolio-level observations. Savings data are net at the meter. LCSE presented in 2014 real dollars.

Figure 4 shows average annual savings and cost values for our sample from 2007 to 2014. As the figure shows, the LCSE deviated modestly from the median over the study period, while average energy savings achieved by program administrators continued to increase.

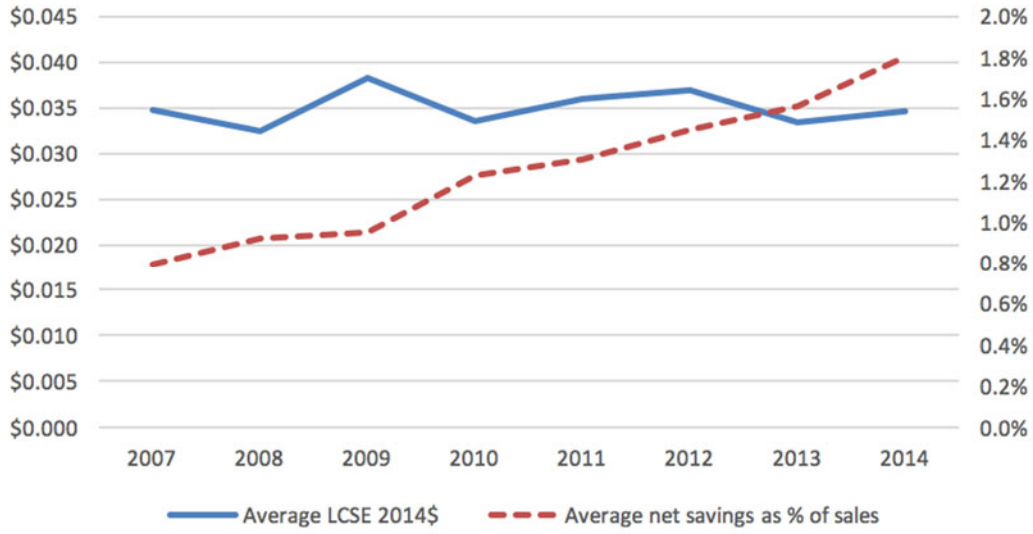


Figure 4. Annual average value of LCSE, portfolio level, 2014 dollars, and average net energy savings as percentage of sales

Ten of the 14 program administrators collect performance incentives. Figures 3 and 4 include performance incentives in the determination of the LCSE. The inclusion of performance incentives has a minimal impact on the LCSE in our sample, with an average increased cost associated with performance incentives of $0.003 per kWh.

## Drivers of High Savings

### State and Local Policy

While utilities deliver energy efficiency programs for multiple reasons, including cultivating positive customer relationships and relieving stress on the grid, they are also in large part driven by the policy directives of state and local regulators. A variety of mechanisms are available to regulators to encourage energy savings, including revenue decoupling, performance incentives, and energy-savings targets or energy efficiency resource standards. Table 2 details the regulatory structures in place for each utility profiled in this report, and we discuss the importance of each policy framework below.

Table 2. Regulatory frameworks in place for program administrators

| Program administrator | State | Type | Energy-savings target | Revenue decoupling or similar mechanism | Performance incentive | Penalty |
|---|---|---|---|---|---|---|
| Arizona Public Service | AZ | IOU | ● | ● | ● | |
| Commonwealth Edison | IL | IOU | ● | | | ● |
| Eversource | MA | IOU | ● | ● | ● | |
| Narragansett Electric | RI | IOU | ● | ● | ● | |
| National Grid | MA | IOU | ● | ● | ● | |
| Pacific Gas & Electric | CA | IOU | ● | ● | ● | |
| Southern California Edison | CA | IOU | ● | ● | ● | |
| Tucson Electric Power | AZ | IOU | ● | ● | ● | |
| Northern States Power | MN | IOU | ● | ●[1] | ● | |
| Fort Collins Utilities | CO | Municipal | ● | | | |
| Otter Tail Power | MN | Municipal | ● | | ● | |
| Seattle City Light | WA | Municipal | ● | | | ● |
| Efficiency Vermont | VT | Third party | ● | NA* | ● | |
| Energy Trust of Oregon | OR | Third party | ● | NA* | | |

Note: Third-party administrators do not sell energy to customers. However Green Mountain Power in Vermont and Portland General Electric in Oregon are decoupled. [1] The decoupling mechanism for Northern States Power Company was approved in a 2015 rate case and was not in place during the achievements outlined in this report.

In a white paper on regulatory frameworks that encourage energy efficiency, Molina and Kushler (2015) noted that the policy most strongly associated with high energy savings was an energy efficiency resource standard. Notably, all of the program administrators profiled in this paper are required to meet energy-savings targets or goals. Fort Collins Utilities and Seattle City Light are subject to local targets, while the other utilities are required to meet state-ordered savings targets. Program administrators in Massachusetts and Rhode Island are subject to an all-cost-effective mandate, but the targets result from a negotiated process. In California utility staff

noted that hitting targets was a major motivator for efficiency-program staff, with progress reports distributed monthly.

Regulators have also taken steps to ensure that utilities and administrators are provided with incentives to meet these targets. With the exception of ComEd in Illinois, every investor-owned utility (IOU) profiled in this report has revenue decoupling or a lost-revenue recovery mechanism in place.[6] Decoupling eliminates the throughput incentive, or the link between a utility's revenues and sales volume, essentially making the utility indifferent to the effect energy efficiency programs might have on energy sales.

The majority of IOUs in our sample (all except ComEd) also are able to earn financial incentives for meeting performance goals. Molina and Kushler (2015) found that regulatory reforms like performance incentives and decoupling may influence utility management to cooperate with state policies that call for specific energy-savings targets, instead of opposing them. The specific structure of these incentives varies from state to state.[7] Penalties are another mechanism states may consider to encourage utilities to meet targets, but these are far less common than incentives, with only a few states including Washington and Illinois setting penalties through legislation.[8] The utility staff interviewed in Washington and Illinois noted that while they were certainly wary of the penalty and were intentional in their efforts to avoid them, they did not feel that the penalty mechanisms were a major driver of success.

The high-achieving municipal utilities and third-party administrators we profiled tended to have more-limited adjustments to their business models. Third-party administrators have no incentive to limit energy efficiency savings because they are not electric-service providers. Municipal utilities, meanwhile, tend to respond to strong support from local regulators. Since municipal utilities are directly beholden to local governments and citizens rather than investors, they may be incentivized to invest in energy efficiency for reasons beyond earnings. In a recent survey of municipal utilities Kushler et al. (2015) found that the highest-ranked factors for providing energy efficiency services were the fact that customers liked these programs, and the fact that the local governing boards of the utility expected or required strong energy efficiency performance. None of the high-achieving municipal utilities we surveyed in this report earn an incentive, and none are decoupled.

## Program Developments

Most of the program administrators we surveyed have been delivering efficiency programs for many years—some for 20 or more years. These program administrators continue to rely heavily on traditional program offerings targeted at lighting, appliances, and equipment.

The contribution from lighting programs as a percentage of total portfolio has declined in recent years, but lighting programs still continue to make up a significant portion of savings for the program administrators we reviewed. There are several key factors driving changes to utility-sector lighting programs. First, changes to lighting standards in the 2007 Energy Independence and Security Act phased in more-efficient lighting standards for general-service screw-in lamps

[6] APS and Tucson Electric Power (TEP) in Arizona both have a lost-revenue adjustment mechanism instead of full revenue decoupling. For more information on lost-revenue adjustments see Gilleo et al. (2015).

[7] See Nowak et al. (2015) for a discussion of performance incentive structures.

[8] Pennsylvania also has a legislative penalty in place. Previous incentive structures in California also included a penalty, but the current model does not.

between 2012 and 2014. Standards for fluorescent lamps and ballasts have also increased. While these changes did raise the baseline for many types of lightbulbs (and corresponding energy savings), savings opportunities still exist in lighting. Second, light-emitting diodes, or LEDs, have dramatically reduced in cost. Many program administrators, while recognizing challenges associated with changing baselines, highlighted the promise of lower-cost LEDs to provide a new source of lighting savings for utility programs. These two factors have increased the energy savings from LED programs for most program administrators we reviewed.

In the early years of efficiency delivery, program administrators tended to offer a simple and minimal selection of program types. However in recent years they have sought new ways to achieve energy-savings goals and maximize cost effectiveness, resulting in more program offerings with savings spread across a variety of programs and end uses. Figure 5 illustrates this trend with an example of portfolio savings by program type for Commonwealth Edison.

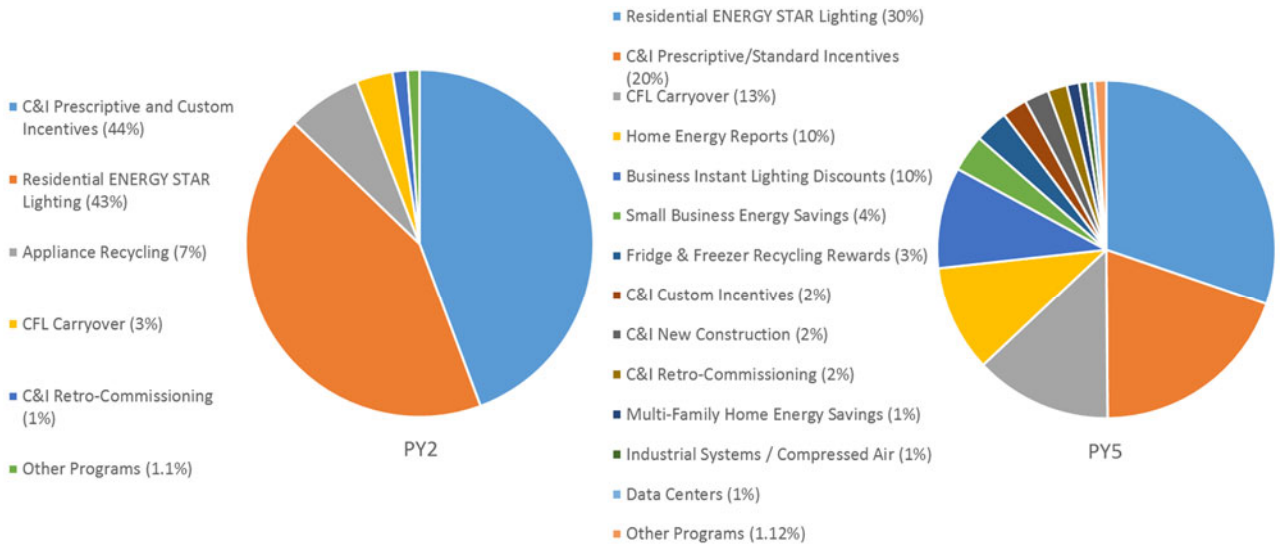


Figure 5. ComEd portfolios in Plan Year 2 (2009) and Plan Year 5 (2012) by program type. *Source*: ComEd annual reports.

Program administrators are also increasingly looking for new programs and technologies to add to their portfolios. We asked program administrators to report on whether they claimed savings in any of the years reported for seven specific program types that we identified as emerging program practices.[9] Table 3 shows the responses to this survey question.

[9] See York et al. (2015) for more on these program types.

Table 3. Innovative program types for which program administrators claim energy savings

| Program administrator | CHP | Building codes | Market transformation initiatives | Conservation voltage reduction (CVR) | Demand response | Rate design | Residential behavior |
|---|---|---|---|---|---|---|---|
| APS | | ● | | Pending | ● | Pending | ● |
| ComEd | ● | Pending | | Pending | | | ● |
| EVT | | | | | | | ● |
| ETO | ● | ● | ● | | | | ● |
| Eversource MA | ● | | ● | | | | ● |
| FCU | Pending | ● | ● | | Pending | Pending | ● |
| NG MA | ● | | ● | | | | ● |
| NEC | ● | ● | ● | Pilot | | | ● |
| OTP | | | | | ● | | ● |
| PG&E | | ● | ● | | | | ● |
| SCL | ● | | ● | | | | ● |
| SCE | | ● | ● | | | | ● |
| TEP | ● | ● | | ● | ● | | ● |
| NSPC | | | | | ● | | ● |

*Source*: As reported by program administrator staff in data requests. Note: the residential behavior program offered by TEP was a pilot and is no longer available.

As table 3 shows, only residential behavior programs were offered by all 14 program administrators in our study through 2014. These programs generally focus on residential customers and involve sending a customer a personalized report on energy use over a given time period. There are several other types of utility behavior programs as well, but the majority of behavior programs in our review were based on home energy reports.[10]

Energy savings from building-code adoption and compliance support were also fairly common, with the majority of program administrators currently offering or planning to offer this type of program. In California building-code support efforts have been a growing source of very cost-effective energy savings, and in 2013 they made up more than 15% of the overall savings reported by PG&E. Green Building, the Fort Collins Utilities program that includes implementation of local amendments to energy codes for residential and commercial buildings, accounted for approximately 9% of 2014 portfolio savings (an increase from 2% in 2011).

The remaining programs on the list are less common. While not a new practice, conservation voltage reduction (CVR) is growing as an energy efficiency program. In general the utilities we surveyed use CVR, but only one claimed credit for CVR as an energy efficiency measure in its most recent portfolio. Two other utilities, APS and ComEd, are considering CVR

[10] For more information on various utility-led behavior program types, please see the *ACEEE Field Guide to Utility-Run Behavior Programs*: aceee.org/sites/default/files/publications/researchreports/b132.pdf.

but are not yet claiming savings. Narragansett Electric Company is currently piloting a CVR program but is not counting energy savings from it at this time.

Of our 14 program administrators, 7 included savings from CHP in their program portfolios. CHP projects have the ability to produce significant energy savings. Nearly 30% of Narragansett Electric Company's energy-savings target in 2014 was attributable to one 12-megawatt (MW) CHP project at Toray Plastics. Narragansett provided 70% of the cost of this project, approximately $16 million. The project will save over 80,000 megawatt-hours (MWh) and 65,000 dekatherms annually according to program staff.

Only two of the companies we surveyed are considering counting energy savings from specific rate-design programs. See York et al. (2015) for a discussion of research on the energy efficiency impacts of rate-design programs.

## Looking Ahead

Our research revealed several trends. First, program portfolios have become more diverse as program administrators rely less on lighting programs to carry performance. Based on our interviews with program managers, this trend will continue in coming years. Future program portfolios will generally not rely as heavily on one program or measure, as many have in the past. Instead program portfolios will consist of many different sources of energy savings.

However lighting programs, including control technologies, are expected to continue to play a large role. Most of the utilities we surveyed had shifted program focus away from compact fluorescent lamps (CFLs) and toward LEDs. While less energy savings are available as incandescent lights are phased out of the market and no longer constitute the baseline from which savings are measured, most program administrators still see significant value in delivering lighting programs, although they note that LEDs are not the silver bullet that CFLs once were for efficiency portfolios.

Program managers expect behavioral programs to continue to grow as a source of cost-effective savings. While these programs typically have only a one-year measure life, recent studies suggest that some portion of the savings may persist for three or more years after initial treatment ends (Khawaja and Stewart 2014). While more needs to be learned about the impact of these programs, many program managers expressed hope that they will account for significant savings in future program portfolios to sustain high levels of savings.

Program managers also mentioned several other programs in our interviews including industrial processes, geothermal heat pumps, energy-management systems for commercial buildings, and deep retrofits for commercial and residential buildings. Many also emphasized the importance of control measures and automation. For example, Energy Trust of Oregon, Fort Collins Utilities, and Otter Tail Power noted that lighting controls and smart thermostats were likely to play a larger role in future portfolios.

Partnerships with third parties, communities, local governments, and other outside entities were also highlighted as critical to maintaining high levels of energy savings. Fort Collins Utilities, for example, works closely with the Larimer County Conservation Corps to deliver a low-income audit and direct-install program. Seattle City Light partners with the Northwest Energy Efficiency Alliance to deliver market-transformation initiatives. Northern States Power Company is working with a local community in Plymouth, Minnesota, to deliver targeted energy efficiency savings to alleviate the need to construct a new high-voltage transmission line, and has also worked with the Center for Energy and Environment to deliver

energy efficiency savings from small businesses for several years. This partnership is very successful and provided Northern States Power Company with 10% of its total electric savings in 2014.

## Ramping up to High Savings: Experience and Advice

We asked program administrators several questions related to how they were able to ramp up to 1.5% and beyond and what advice they might offer to program administrators intending to do the same. The most common reply was that administrators should ensure that program delivery infrastructure is in place and ready to deliver the volume of services necessary to meet new program demands.

Delivery infrastructure can include the labor and resources necessary for program design, reporting, implementation, and evaluation. Externally infrastructure is related to the contractors and program delivery network necessary for program implementation. Most program administrators we interviewed stressed the critical importance of ensuring delivery infrastructure, as well as quality control of the work done by those delivering programs, in order to ensure customer satisfaction and long-term success.

Other program administrators pointed to the value of integrating evaluation with program planning and delivery. Using evaluation results to modify and improve program performance was critical to success for several program managers we interviewed. The use of public processes for engagement and education was cited as a source of public support and credibility. Program managers stressed the diversification of program offerings as a key to success in ramping up. They noted that administrators should be open to new approaches in program delivery such as midstream and upstream efforts. Those we interviewed also suggested working closely with trade allies to leverage existing markets for products and services instead of attempting to create new markets. Finally, those we interviewed often characterized customer engagement and marketing as critical pieces to ensure that customers understand programs, products, and services, in order to fully capture customer savings.

## Conclusion

Our review of this group of 14 leading energy efficiency program administrators demonstrates that high levels of energy savings are not only achievable but also sustainable. Even as program administrators face substantial challenges that limit savings opportunities in traditional areas, energy savings have increased from year to year. Advances in technology, reductions in measure costs, and program innovation will continue to create new savings opportunities, allowing program administrators to sustain and grow high levels of savings.

Importantly, the cost of saved energy has remained flat since 2010 while total savings levels have increased. Even as portfolios have matured and natural gas prices have declined to unprecedented lows, energy efficiency remains a cost-effective investment. The evidence we reviewed also suggests this is true across the country and for all types of program administrators.

Finally, state and local policies are critical to driving and sustaining high levels of savings. All of the program administrators profiled in this paper are required to meet energy-savings targets or goals. Cost-recovery mechanisms (for program costs and lost revenues) are critical in influencing utilities to increase savings (Molina and Kushler 2015). Many program managers stressed the importance of having appropriate financial policies in place, in order to achieve program success. Notably, we found that utility performance incentives have a minimal

impact on the LCSE but were significant motivators for achieving high levels of savings. Strong support from regulatory bodies, such as state regulatory commissions, is also critical to maintaining high levels of savings.

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**Quantitative Data**


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