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Benchmarking Electric Utility Energy Efficiency Portfolios in the U.S.

M.J. Bradley & Associates, LLC

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Table of Contents

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Foreword

In these uncertain economic times, making smart investments in energy is of paramount importance. Our country faces a critical need for jobs, energy security, and cleaner ways to power our economy. Investing in energy efficiency has the potential to help address each of these challenges.

Utilities are at the center of the energy efficiency opportunity. They manage millions of customer relationships, hold data on energy use patterns across their service territories, and have the ability to assist utility commissions by displacing generation with sound energy efficiency policies.

Twenty-six states have recognized that energy efficiency is the cheapest way to meet new and existing demand, and have implemented some form of energy efficiency resource standard. Many utility regulators have established rules that require utilities, such as National Grid, to invest in cost-effective energy efficiency before investing in new power plants.

The rationale for this is clear. Cost-effective energy efficiency measures allow us to provide customers with one kilowatt-hour of energy savings for between three and five cents. In comparison, customers around the United States pay between 6.5 cents and 16.5 cents for their electricity, depending on where they live. As a result, investing in energy efficiency can typically produce three to four dollars of savings for each dollar invested. In 2012, our total savings through new energy efficiency investment in Massachusetts is expected to be over one million megawatt-hours—as much electricity as 92,000 typical homes would use in a year.

At the same time as it is saving us money and reducing emissions, energy efficiency is helping our economy. Energy efficiency projects yield positive returns for our customers, create local jobs for thousands of workers, and save millions of megawatt-hours of electricity. We managed to grow our economy in Massachusetts by nearly four percent per year from 1999 through 2009, even while the state's electricity consumption grew less than one percent per year. Decreasing energy intensity in this way provides significant competitive advantage to Massachusetts and to our entire country.

National Grid welcomes this MJB&A report as a clear assessment of the status quo. It evaluates utility-sponsored energy efficiency programs and improves our ability to understand their reach, identify their strengths, and fix their weaknesses. We hope that this report will in fact be followed by others, and that the industry will in turn benefit by gaining access to industry-wide metrics that help us be smarter and more effective with our programs.

Edward White, Jr.
Vice President, Energy Products
National Grid

Preface

The goal of this report is to highlight the importance—and the challenges—of benchmarking electric utility energy efficiency portfolios, and to initiate a benchmarking process that will continue to evolve over time. Benchmarking allows for direct comparison of spending and energy savings across electric utility energy efficiency portfolios. This report discusses the difficulties involved in benchmarking energy efficiency portfolios, evaluates and recommends a suite of metrics, and demonstrates these metrics using a diverse set of electric utilities.

Many energy efficiency reports evaluate state-level policies and aggregate results or highlight individual programs of leading utilities. This report is different in that it provides a top down analysis of electric utility energy efficiency portfolios—something that is not routinely provided publicly today. This has not been done to date not because no one has thought of it, but rather because existing datasets are challenging to compare given the different approaches to portfolio design, implementation and accounting for energy savings that exist from jurisdiction to jurisdiction and hence from utility to utility.

Data on U.S. ratepayer-funded energy efficiency portfolios are available to the public through databases maintained by federal agencies. Electric power industry participants in the United States are required to report demand side management spending and energy savings data to the Energy Information Administration (EIA) through form EIA-861. Other sources of data include public utility commissions, which often require utilities to file program planning documents, independent evaluation, monitoring and verification reports (EM&V), and annual spending and energy savings information on their energy efficiency programs, and industry data gathering efforts such as that of the Consortium for Energy Efficiency (CEE). This report is based on 2009 utility level data publicly available from EIA.

Ideally, benchmarking should serve as a key component of the effort to increase deployment of energy efficiency by broadly identifying the best-performing portfolios. This could potentially lead to greater cooperation around the industry over successful program implementation and helping regulators set targets and appropriate budgets. While the benchmarking is not perfect, it illustrates the relative magnitude of energy efficiency spending and energy savings.

Benchmarking utility energy efficiency programs is becoming increasingly important as ratepayer funded budgets grow and as state and federal policymakers evaluate policies to address energy and environmental issues. This inaugural report does not include efficiency programs in natural gas and fuel oil nor does it include efficiency programs administered by third parties, as EIA does not require the reporting of this information. These are likely to be included in future reports if any when these data become widely available.

The report is available in PDF format on the Internet at http://www.mjbradley.com. For questions or comments about this report, please contact:

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Executive Summary

This report examines and compares the energy efficiency expenditures and energy savings of a diverse set of electric utility ratepayer-funded energy efficiency portfolios in the United States while highlighting the challenges that face this and similar efforts. Given the current shortcomings of publicly available data, this report should be viewed as an opening statement in an ongoing dialogue over the importance of comparing energy efficiency portfolios and the process for doing so.

Table ES-1 lists the 50 electric utilities featured in this report ranked by total electricity sales. These utilities include public and private entities that together account for nearly one third of retail electricity sales and over two thirds of electric energy efficiency spending reported to the Energy Information Administration (EIA) through form EIA-861 in the 2009 data year.

The list includes 37 investor-owned utilities, four municipal utilities, five utilities controlled by states or political subdivisions, three electric cooperatives, and one federal utility. These utilities were selected to reflect a diverse and representative sampling of distribution companies throughout the U.S. that administer energy efficiency portfolios for the benefit of their customers. The utilities were selected based on data availability to represent a wide range of spending, savings, region of operation, electricity prices, and a variety of other factors.

Table ES-1: Selected Utilities by Total Retail Electricity Sales

Utility Name	Parent Company Name	2009 MWh (millions)
Florida Power & Light	NextEra Energy	102.8
Pacific Gas & Electric	PG&E	86.0
Southern California Edison	Edison International	85.8
Georgia Power	Southern	81.3
PacifiCorp	MidAmerican	52.8
Alabama Power	Southern	51.0
Progress Energy Florida	Progress Energy	37.8
Consumers Energy	CMS Energy	35.4
Union Electric	Ameren	35.1
Northern States Power - Minnesota	Xcel	34.7
Baltimore Gas & Electric	Constellation	31.6
Tennessee Valley Authority	Tennessee Valley Authority	30.2
Arizona Public Service	Pinnacle West	28.2
Public Service of Colorado	Xcel	27.4
Potomac Electric Power	Pepco Holdings	26.5
Duke Energy Indiana	Duke	26.2
Salt River Project	Salt River Project	26.2
Wisconsin Power & Light	Alliant Energy	9.9
Ohio Power	AEP	24.9
Puget Sound Energy	Puget Holdings	23.9
Ohio Edison	FirstEnergy	22.9
Connecticut Light & Power	Northeast Utilities	22.3
Nevada Power	NV Energy	21.4
Massachusetts Electric	National Grid	21.0
MidAmerican Energy	MidAmerican	20.4
City of San Antonio	CPS Energy	20.0
Entergy Arkansas	Entergy	19.9
Duke Energy Ohio	Duke	19.6
Long Island Power Authority	Long Island Power Authority	19.3
Southwestern Electric Power	AEP	16.1
Interstate Power & Light	Alliant Energy	14.9
Indianapolis Power & Light	AES	14.1
Idaho Power	IDACORP	13.9
Metropolitan Edison	FirstEnergy	13.5
Austin Energy	Austin Energy	12.0
Sacramento Municipal Utility District	SMUD	10.7
Santee Cooper	Santee Cooper	10.2
Omaha Public Power District	Omaha Public Power District	10.1
Seattle City Light	Seattle City Light	9.7
Mississippi Power	Southern	9.3
Avista	Avista	9.0
Public Service of New Mexico	PNM Resources	8.9
Public Service of New Hampshire	Northeast Utilities	7.7
Narragansett Electric	National Grid	7.6
El Paso Electric	El Paso Electric	7.1
Western Massachusetts Electric	Northeast Utilities	3.6
Lee County Electric Cooperative	Lee County Electric Cooperative	3.5
Lincoln Electric System	Lincoln Electric System	3.1
United Electric Coop Service	United Electric Coop Service	1.8
Fairfield Electric Cooperative	Fairfield Electric Cooperative	0.6

The selected utilities are benchmarked on energy efficiency spending and savings reported to EIA. Specifically, the utilities are ranked based on the following metrics:

- Total energy efficiency expenditures;
- Efficiency expenditures per megawatt-hour of retail sales (relative spending);
- Total incremental savings (savings from measures implemented during the reporting year); and
- Incremental savings as a percentage of megawatt-hours delivered (relative savings).

These metrics were chosen because they provide a relatively fair assessment of both the absolute and relative status of utility-administered energy efficiency portfolios, based on available data reported by the utilities to EIA. Issues with data availability prevented the inclusion of metrics tracking changes in spending and savings over time, or calculating cost-effectiveness.

The selected utilities varied considerably in their levels of annual energy efficiency portfolio spending and savings achieved.

- Reported energy efficiency expenditures of the selected utilities ranged from under $100,000 (Fairfield Electric Cooperative) to nearly $410 million (Pacific Gas & Electric).
- Normalized for retail electricity sales, reported energy efficiency expenditures ranged from about $0.02 per megawatt-hour of retail electricity sales (Ohio Edison) to about $4.80 per megawatt-hour of retail electricity sales (Pacific Gas & Electric).
- Reported annualized energy savings from new energy efficiency measures ranged from about 500 (Ohio Edison) to nearly 1.6 million megawatt-hours (Southern California Edison and Pacific Gas & Electric).
- As a percentage of total retail sales, the selected utilities reported energy savings from under 0.1 percent to nearly 2 percent.
- The top 10 utilities all reported achieving single-year energy savings equal to 1 percent or more of their annual electricity sales.

Larger and more successful programs tend to coincide with stable multiyear budgets, clear energy savings goals, and mechanisms that align utility financial incentives with delivery of effective energy efficiency portfolios.

State policies and political support for energy efficiency are major drivers of utility spending, particularly for regulated, investor-owned utilities. Through an appropriate mix of policies, states can remove the disincentives traditional regulation created for a utility to aggressively pursue cost-effective energy efficiency.[1] Not surprisingly, larger and more successful programs tend to coincide with stable multiyear budgets, clear energy savings goals, and mechanisms that align utility financial incentives with delivery of effective energy efficiency portfolios (for example, decoupling of utility revenues from electricity sales and shareholder incentives to achieve savings from consumer energy efficiency programs).

The extent to which programs differ by region indicates the importance of variations in state policy and climatic zones, customer composition, utility experience, and the evaluation, measurement, and verification provisions in place.

A major obstacle to benchmarking ratepayer-funded energy efficiency portfolios is the availability, quality, and comparability of data. Currently, there is no comprehensive data source that collects and publicly releases all the data necessary to conduct a robust benchmarking of energy efficiency programs. While comprehensive national data are not available, state utility commissions generally provide rigorous oversight of energy efficiency program plans, spending and energy savings and require that significant resources be dedicated to evaluation, measurement, and verification. The data shortcomings that impact national benchmarking are largely due to the lack of current federal reporting programs' lack of rigorous, standardized definitions; quality assurance and quality control; and needed authority and financial resources for EIA.

Introduction

This report provides a discussion of benchmarking ratepayer-funded electric utility energy efficiency portfolios in the United States. Measuring and comparing energy efficiency portfolios is becoming increasingly important as energy efficiency begins to play a larger role in our nation's energy mix, and utility energy efficiency budgets increase.[2] The goal of this report is to highlight the importance—and the challenges—of benchmarking electric energy efficiency portfolios, and to initiate a benchmarking process that will continue to evolve over time.

This report focuses solely on utility-administered electric energy efficiency portfolios. Although efficiency programs exist for natural gas and other fuels, there are insufficient data available at this time to allow benchmarking of these programs. Similarly, due to data and comparability issues, third-party administrators, which manage some or all efficiency programs in certain states, are not included in this report.

While electric utility companies are currently benchmarked against their peers on a variety of issues, ranging from reliability and customer satisfaction to air emissions and sustainability, there is currently no comprehensive ranking of the industry's energy efficiency portfolios by utility. This is a gap that should be addressed in order to provide better information for stakeholders and improve the quality and performance of efficiency programs. A benchmarking analysis can provide tremendous value for stakeholders and regulators who want to compare the magnitude of energy efficiency portfolio budgets and energy savings between electric utility companies, recognize best practices, and perhaps most importantly, discover where utilities are lagging behind and identify opportunities for action.

The main challenge in ranking energy efficiency portfolios is to establish an informative set of comparative metrics, based on data that is available, consistent, and reliable.

As with any benchmarking process, the main challenge in ranking energy efficiency portfolios is to establish an informative set of comparative metrics, based on data that is available, consistent, and reliable. This report discusses the difficulties involved in benchmarking energy efficiency portfolios, evaluates and recommends a suite of metrics, and demonstrates these metrics using a diverse set of electric utilities.

Many energy efficiency reports aggregate energy efficiency programs at a state or national level, or highlight individual programs as best practices. This report is different in that it provides a top-down analysis of a diverse mix of energy efficiency portfolios administered by individual electric utilities across the United States. This type of analysis has not been conducted to date due to the unique challenges it poses. Currently, publicly available data on utility energy efficiency programs have numerous issues with quality and comparability. As such, any initial attempt to benchmark utilities using these data will necessarily be flawed. This report will serve to illustrate the relative magnitude of energy efficiency expenditures and energy savings between selected utilities, and to highlight the work that still needs to be done in providing publicly available, quality-assured, and comparable data.

Energy Efficiency: State of the Market

Policymakers, electric utilities, and other stakeholders broadly agree that energy efficiency is a proven, least-cost energy resource that should play a foundational role in the nation's energy strategy. Energy efficiency lowers bills for customers, enhances grid reliability, offsets the need for new generation and transmission capacity, reduces air pollution and other supply-side environmental impacts, creates jobs, and expands markets for energy-efficient technologies and services.

New EPA rules regulating air emissions from fossil fuel power plants will require electric utilities to deploy a wide range of pollution-control technologies, new power plants with relatively low emissions, and demand-side measures to reduce air emissions from electricity production.

Investments in energy efficiency create construction and manufacturing jobs and redirect spending from energy—which creates very few jobs per dollar spent—to more employment-intensive industries. For example, one study found that California's energy efficiency policies from 1972-2006 drove a net increase of 1.5 million full-time equivalent jobs, and saved households $56 billion on their energy bills.[3]

In its widely-cited market survey, McKinsey & Company estimates that total 2008 efficiency market spending was on the order of $10 to $12 billion: $2.5 billion through utility programs, $3.5 billion through Energy Service Companies (ESCOs), and $4 to $6 billion on "insulation and devices."[4] This excludes expenditures of $8 to $10 billion on energy-saving equipment and services mandated by building codes.[5]

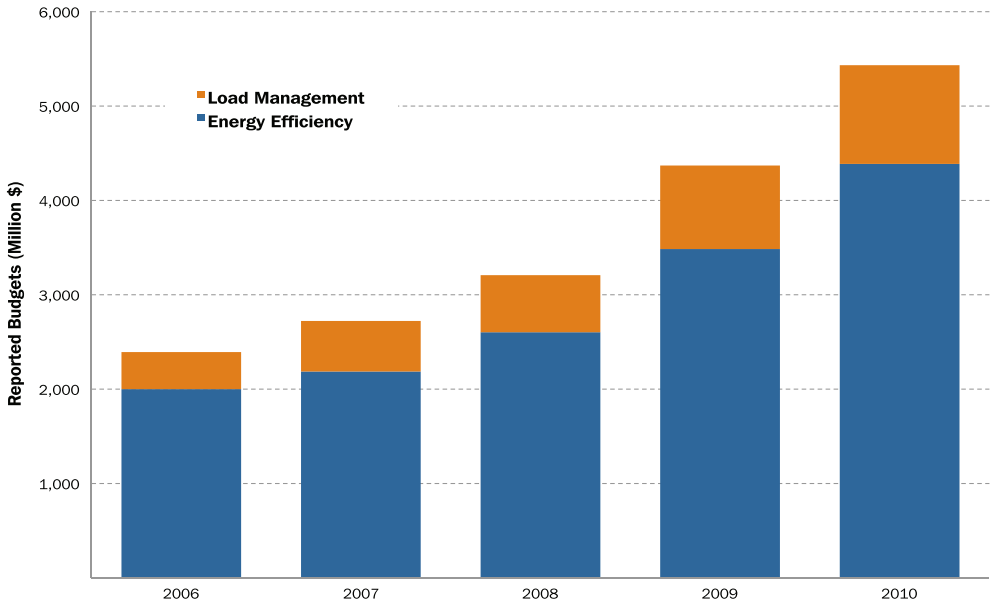
Support for energy efficiency has expanded significantly in recent years. For instance, the American Recovery and Reinvestment Act of 2009 (Recovery Act) included the largest single investment in energy efficiency in U.S. history. Approximately $30 billion was allocated for energy efficiency programs, about $12 billion of which went directly to states.[6] For some states, these funds constituted their first significant investments in energy efficiency and introduced consumers and policy-makers to the benefits of energy efficiency.

As states gain more experience with energy efficiency programs, multiyear funding plans have become more commonplace. Such plans are critical to ensure successful ongoing implementation of efficiency measures, as they provide certainty for consumers, utilities, and third-party contractors while allowing for better long-term planning and increased administrative efficiency. While states in the Northeast, California, and the Pacific Northwest have traditionally led the way, policy support for efficiency has grown fastest in Midwestern and Mid-Atlantic states over recent years.[7]

According to the Consortium for Energy Efficiency's (CEE) most recent survey, ratepayer-funded efficiency programs (including both utilities and third-party administrators) budgeted over $5.4 billion in demand-side management spending for 2010. This represents a 24 percent increase over reported 2009 budgets of nearly $4.4 billion.[8] ***Figure 1*** illustrates this rapid growth in DSM budgets, with energy efficiency leading the way.

According to the Consortium for Energy Efficiency's most recent survey, ratepayer-funded efficiency programs budgeted over $5.4 billion in demand-side management spending for 2010. This represents a 24 percent increase over reported 2009 budgets of nearly $4.4 billion.

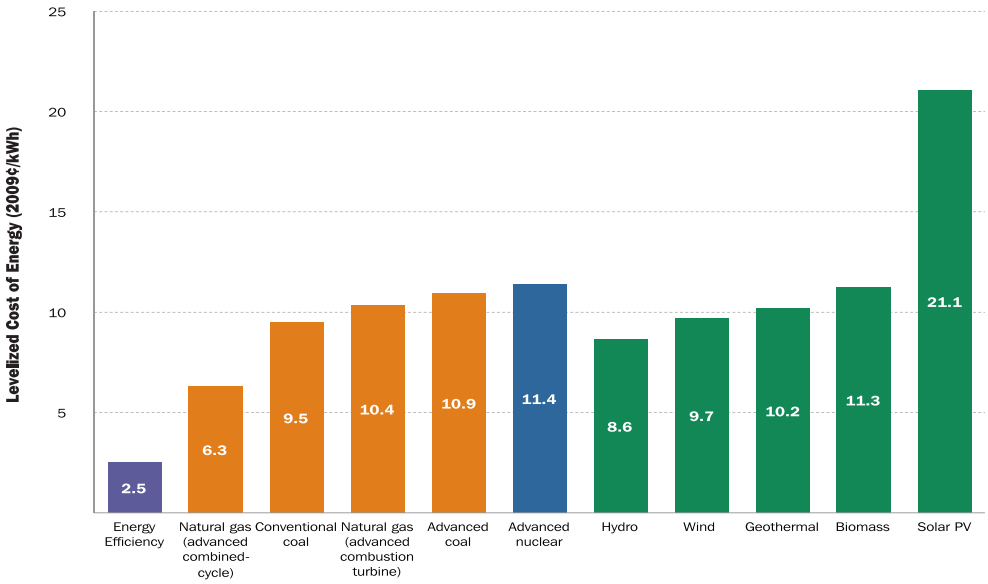
Figure 1: Growth of Reported Energy Efficiency Budgets (2006—2010)



Source: Consortium for Energy Efficiency

Although budgets for ratepayer-funded electric energy efficiency programs have increased substantially in recent years, these expenditures comprise just a small fraction of total electric sector spending. In 2009 ratepayer-funded electric efficiency programs totaled $4.4 billion, but by comparison, consumers spent nearly $360 billion on electricity.[9] In the same year, power producers brought over 23 gigawatts of new generating capacity online for an estimated cost of about $34.5 billion.[10,11] This new generation is significantly more expensive than energy efficiency; many researchers and utilities have conducted detailed evaluations of energy efficiency costs relative to generation and consistently find that supply-side resources cost at least three times as much as energy efficiency on a kilowatt-hour basis. ***Figure 2*** compares EIA's projections of the cost of various types of new generation in 2016 with the average cost of energy efficiency.[12,13]

Figure 2: Cost of Energy Efficiency vs. Levelized Cost of New Generation (2016)



Source: EIA Annual Energy Outlook 2011 and ACEEE

Purpose of Benchmarking

Transparent information on ratepayer-funded energy efficiency portfolios is useful to a wide range of decision-makers, including electric companies, financial analysts, investors, policymakers, and consumers.

For electric utilities, the provision of transparent information supports corporate self-evaluation and business planning by allowing companies to assess their performance relative to key competitors, prior years, and industry benchmarks. By understanding and tracking their performance, companies can evaluate how different business decisions may affect performance over time, and how they may more appropriately consider energy supply and demand issues in their corporate policies and business planning.

The financial community and investors in the electric utility industry need accurate information concerning energy efficiency investments and outcomes in order to evaluate how utilities are adjusting their business models to focus on demand-side resources. Energy savings information is material to investors and can be an important indicator of how well a company is maintaining resource diversity and managing customer costs and risks such as future environmental regulation and fuel price volatility. Furthermore, the increasing prevalence of incentives for utilities that achieve or surpass savings targets represents an emerging opportunity for shareholders to benefit from successful efficiency programs.

Information on energy efficiency rankings is also useful to state and federal policymakers who are working to develop long-term solutions to energy and environmental issues. Information about energy efficiency helps policymakers by indicating which regulatory policies have been effective, where opportunities may exist for improvements, and where policy action is required to encourage further energy efficiency gains.

Finally, benchmarking information is valuable to electricity consumers. Accurate information on the costs and impacts of energy efficiency investments builds public awareness of energy and environmental issues and the fact that efficiency remains a plentiful resource with lower costs than supply-side investments. A straightforward, public comparison of efficiency programs allows consumers to judge how well their utility uses ratepayer dollars to deploy energy efficiency relative to others across the country, and the efficacy of the programs the utility implements. This knowledge enables consumers to hold companies accountable for decisions and activities that affect their electricity bills and rates, as well as the environment and public health.

Accurate information on the costs and impacts of energy efficiency investments builds public awareness of energy and environmental issues and the fact that efficiency remains a plentiful resource with lower costs than supply-side investments.

Benchmarking efficiency portfolios can also help the public verify that companies are meeting their energy reduction and environmental commitments. For example, some electric companies are establishing voluntary energy and emissions reduction goals; other companies are required by statute to make such reductions. Public information is necessary to verify the energy and emission reduction claims made by utilities. Public awareness of companies' environmental performance supports informed public policymaking by promoting understanding of the economic and environmental tradeoffs of different energy supply and demand-side options and policy approaches.

Benchmarking is not a new concept for the electric utility sector. In fact, electric utilities are routinely benchmarked or benchmark themselves on a wide range of business and operational issues including, but not limited to, the following:

- Compensation packages of top level executives;
- Customer satisfaction;
- Reliability performance;
- Safety records;
- Air pollution and greenhouse gas emissions;
- Climate change-related risks and opportunities; and
- Sustainability efforts.

In the future, robust benchmarking of efficiency programs should aim to fill the current void and create a comprehensive comparison of efficiency programs to support greater stakeholder involvement.

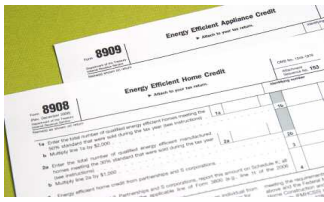
Benchmarking Challenges

Currently, the greatest obstacles to benchmarking electric energy efficiency portfolios are data availability and comparability. Publicly available data on efficiency portfolios are limited, contain gaps, and lack quality assurance. For a detailed discussion of these problems, see the "Data Sources, Quality, and Problems" section of this report.

Even with improved data, comparing efficiency portfolios of utilities that operate under different circumstances and policy regimes would present considerable challenges. Factors that tend to confound comparisons between utility efficiency portfolios include, among others, differences in measuring and accounting for energy savings; regulatory structures; geographic region of operation; customer composition; electricity rates; and utility experience. Below is a brief overview of several ways which two utilities may differ and how these differences can affect the comparison of energy efficiency portfolios.

Evaluation, Measurement & Verification Standards

Evaluation, measurement, & verification (EM&V) protocols are used to estimate savings from individual efficiency projects, programs, and portfolios. Differences in EM&V standards for efficiency programs across jurisdictions raise considerable concerns over the comparability of program results. State public utility commissions (PUCs) or other regulatory authorities are typically responsible for establishing EM&V requirements for the efficiency programs under their jurisdiction. According to a recent report released by the Lawrence Berkeley National Laboratory, nearly 20 states have created or are in the process of creating their own EM&V protocols or guidelines for energy efficiency efforts.[14] As such, the definition and measurement of a megawatt-hour saved may vary from state-to-state. For example, utilities in Minnesota, Iowa, and Maine report gross savings while those in other states, such as California and Vermont, perform net-to-gross analysis and report verified net savings. Some states uses "stipulated" savings values (based on standard assumptions of the energy savings provided by particular projects), while others conduct considerably more on-site analysis. Which data are reported to regulatory bodies can vary as well: some utilities may report ex ante expectations of savings, while others may report ex post savings values that have been subjected to verification and review. Several organizations are currently working to increase the consistency of EM&V across the industry at either the regional or national level, including:



Factors that tend to confound comparisons between utility efficiency portfolios include, among others, differences in measuring and accounting for energy savings; regulatory structures; geographic region of operation; customer composition; electricity rates; and utility experience.

- The Northwest Regional Technical Forum (RTF) serves as a model for developing common regional EM&V protocols.[15]
- The Northeast Energy Efficiency Partnership manages the Evaluation, Measurement, and Verification Forum (EM&V Forum). The EM&V Forum is a multi-year project to support the development and use of consistent EM&V protocols, and in the reporting of savings impacts and costs for energy efficiency and demand-side resources.[16]
- The North American Energy Standards Board has begun a process that may lead to the development of M&V standards that would apply to both wholesale and retail energy efficiency markets.[17]
- The State and Local Energy Efficiency Action Network (SEE Action) is a state and local effort facilitated by the federal government that helps states, utilities, and other local stakeholders take energy efficiency to scale and achieve all cost-effective energy efficiency by 2020. The EM&V Working Group leads the SEE Action efforts to improve energy efficiency management by increasing the accuracy, credibility, and timeliness of EM&V results.[18]

Despite these efforts, there is currently no national standard for how program-level EM&V is conducted. There is also a lack of consistency in what gets reported by program administrators to EIA. In other words, there are two key areas for uncertainty: one is the differences in measurement practices by utilities as directed by their utility commissions, and the other is the decision of what values are reported to EIA. Therefore, even when savings data are available and appear reasonably sound, they may not be directly comparable to savings reported by a utility in a different state.

Regulatory and Policy Differences

Electric utilities charge their customers based on the quantity of electricity they consume. These volumetric charges are used to pay for fixed costs such as the cost of owning, operating and maintaining transmission and distribution equipment. However, under a regulatory model in which utility revenues are tied to the volume of energy sales, energy efficiency leads to lower revenues by reducing demand or demand growth. Traditional regulation is therefore often a major obstacle to maximizing investment in low cost energy efficiency programs.

Regulators in many states have taken action to eliminate the disincentives present for energy efficiency in the volume model through mechanisms that align utility financial incentives with delivery of effective energy efficiency programs. One method is "decoupling," in which utilities' revenues do not depend on the volume of electricity sales.

Increasingly, states have also created performance incentives that offer investor-owned utilities an opportunity to earn a profit on energy efficiency, to help level the playing field with investments in generation. In many states, utilities can share in the overall bill savings the efficiency programs provide to customers, encouraging utilities to maximize energy savings while minimizing the costs of programs. In other states, utilities can earn bonuses for exceeding energy efficiency targets such as those required by a state's EERS, or can earn a rate on return on efficiency investments as they would on supply-side investments. Such shareholder incentives have proven to be correlated with higher utility investment in energy efficiency programs.[19]

Increasingly, states have also created performance incentives that offer investor-owned utilities an opportunity to earn a profit on energy efficiency, to help level the playing field with investments in generation.

Another policy aimed at expanding efficiency efforts is an Energy Efficiency Resource Standard (EERS). These policies, currently only enacted at the state level, require electric distribution companies to meet energy savings goals. As of December 2010, 30 states had adopted or had a pending EERS or energy savings target—more than double the number of states in 2006.[20] Some states, including several Northeast states and California, take an "efficiency procurement" or "loading order" approach to energy efficiency policies, in which state policy requires utilities to invest in all cost-effective energy efficiency that is cheaper than supply resources.

An additional policy variable that can influence energy efficiency programs is the use of codes and standards. Many states and local governments have adopted building codes for energy efficient construction, and standards also exist in many jurisdictions for appliances and equipment that achieve a certain level of efficiency. Some jurisdictions provide utility programs credit for their involvement in passing and helping to implement codes. Often, energy efficiency programs and codes work together synergistically, as efficiency programs provide an incentive for the development of emerging efficiency technologies, and once these technologies are established they become incorporated into codes.[21]

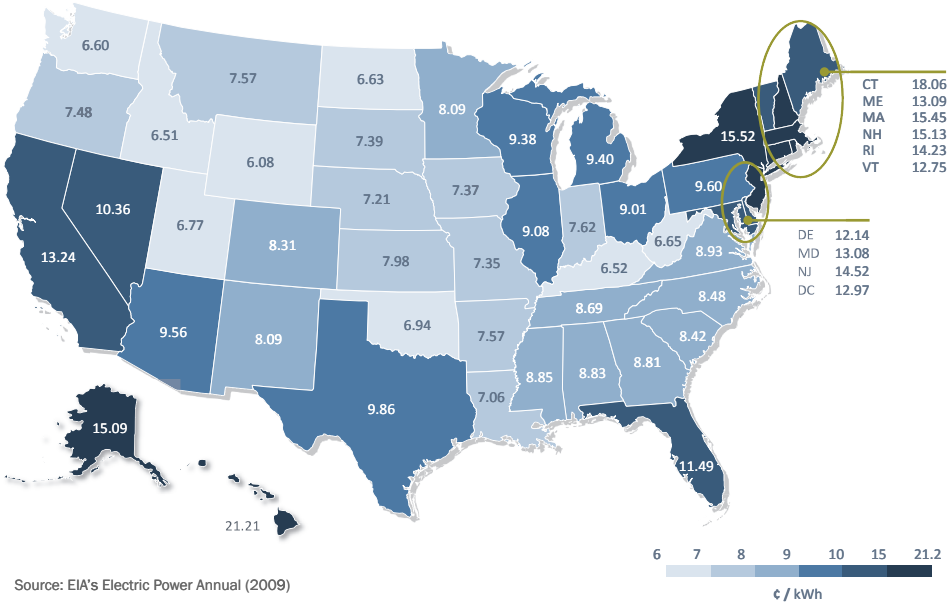
Customer Composition

A utility's customer composition is another factor that varies from one utility to another and presents challenges for comparing energy efficiency programs. For example, a utility that serves numerous industrial customers would likely need to customize energy efficiency projects to serve each customer. Marketing costs of these programs would generally be lower, since individual outreach would be the most effective way to encourage enrollment. Alternatively, a utility with mostly residential customers may need to spend significantly more resources on marketing in order to reach its ratepayers, but the programs the utility offers may be relatively straightforward. Furthermore, participation among urban, suburban, and rural ratepayers can vary considerably. In urban areas, where renting apartments is more common, participation may suffer due to split incentives, or the "Principal-Agent" problem—landlords are less inclined to invest in energy efficiency because tenants pay energy bills, and tenants are hesitant to make improvements because they do not own the property and may not receive the full term of benefits from a project. Numerous other ratepayer composition factors can also influence program participation.

Electricity Rates

Energy efficiency is a least-cost energy resource. However, the precise economic benefit to ratepayers of a specific project or program depends on where it is implemented, due to regional differences in electricity prices, which can affect project participation. The rate that customers pay for electricity is dependent on a variety of factors, including the age and fuel sources of the generation mix associated with delivered electricity. ***Figure 3*** presents the average 2009 electricity rate in each state across all utilities and customer classes. As Figure 3 demonstrates, the economic impact for customers of saving a kilowatt-hour in New York is not the same as saving a kilowatt-hour in Georgia. While an energy efficiency project or program may reduce a similar amount of electricity in both locations, the net economic benefits to the electricity consumer are different. This may influence participation in utility energy efficiency programs. However, the avoided costs for utilities from implementing energy efficiency are less variable.

Figure 3: 2009 Average State Electricity Rates, All Customer Classes (¢/kWh)



Source: EIA's Electric Power Annual (2009)

The economic impact for customers of saving a kilowatt-hour in New York is not the same as saving a kilowatt-hour in Georgia. While an energy efficiency project or program may reduce a similar amount of electricity in both locations, the net economic benefits to the electricity consumer are different.

Utility Experience with Efficiency Programs

Electric utilities in the U.S. are at various stages of energy efficiency program design and implementation. While several utilities have sophisticated energy efficiency program offerings targeting every customer class, others have just begun offering programs to their customers. Despite efforts to publicize best practices and learn from experiences of other utilities, there is still a considerable learning curve that utilities undergo when they begin administering efficiency programs, and older programs may be more successful overall.

Utility Selection

For any benchmarking exercise, establishing the universe of companies to compare is the first crucial step. Since it would be overly cumbersome to evaluate all utilities in the country that report to EIA, narrowing the field to a reasonable size is necessary.

For the purposes of this report, a sample of utilities was selected with an eye to diversity. Utilities were chosen that represented a broad cross-section of the nation's utilities with regard to a number of qualities, including:

- Geographic region (census region, climatic zone)
- Population density of service territory (population/square mile)
- Total electricity deliveries (megawatt-hours)
- Electricity rates (average ¢/kWh)
- Distribution of customers by ratepayer class (residential, commercial, or industrial)
- Distribution of sales by ratepayer class
- Ownership type (investor-owned utility, municipal, cooperative, etc.)
- Regulatory structure (vertically-integrated or deregulated)

In addition to describing a wide range of relevant utility operating characteristics, many of these criteria are likely to have a significant impact on the structure, funding, and effectiveness of electric energy efficiency programs.

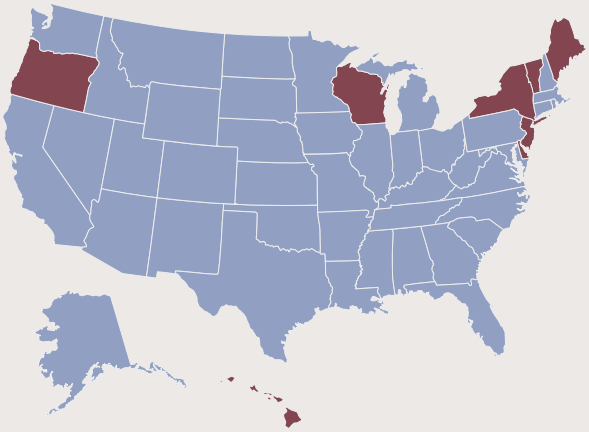
The utilities that resulted from this selection process are listed in ***Table 1,*** and ***Figure 4*** (pages 19 and 20) displays the service territories of these utilities.

It is important to note that a few of these utilities operate in states where efficiency programs are also administered by third-party administrators. Nine states, including New York, Oregon, and Wisconsin, have third-party administrators that administer energy efficiency programs either instead of or alongside utilities. In these states, generally speaking, a system benefit surcharge is added to all utility bills; the utility then passes on the funding collected through the surcharge to the efficiency administrator, who uses it to administer energy efficiency programs to utility ratepayers. These third-party administrators, in the states that have them, often take the place of utilities in administering energy efficiency programs, and are generally funded by ratepayers through a surcharge on their electric bills. (See box on page 18.)

Because these administrators do not report data to EIA, they were not included in our benchmarking; nonetheless, they do account for a substantial volume of the ratepayer-funded energy efficiency programs in the United States. The Consortium for Energy Efficiency reports that $436 million was spent by third-party ratepayer-funded energy efficiency administrators in 2009, with $588 million budgeted for 2010.[22]

Third-Party Administrators

Nine states have some form of third-party administrator that administers energy efficiency programs using ratepayer funds, either instead of or alongside utilities. In these states, generally speaking, a system benefit charge (SBC) is added to all utility bills; these funds are then passed on to the efficiency administrator, who uses it to administer energy efficiency programs to utility ratepayers. These administrators are also often the recipient of federal stimulus funds or funding from programs such as the Regional Greenhouse Gas Initiative in the Northeast.



Vermont—Efficiency Vermont is run by a non-profit corporation, the Vermont Energy Investment Corporation, under appointment by the Vermont Public Service Board. It is funded by an energy efficiency charge on utility bills and administers efficiency programs in the state in place of utilities.

Maine—Efficiency Maine Trust is overseen by the state's Public Utility Commission, funded by an SBC, and administers efficiency programs in the state in place of utilities.

Hawaii—Hawaii Energy is Hawaii's conservation and efficiency administrator, and is funded by a public benefits charge on customer bills under contract with the state's Public Utility Commission.

Oregon—Energy Trust of Oregon serves the customers of Portland General Electric, Pacific Power, NW Natural and Cascade Natural Gas; is funded by an SBC assessed to those customers; and is overseen by the PUC.

New York—NYSERDA, a state agency, administers an SBC-funded set of programs called New York Energy $mart; utilities in the state also administer their own programs.

New Jersey—Energy efficiency funds are collected by utilities through an SBC, which is then paid to the New Jersey Clean Energy Program, overseen by the Board of Public Utilities. This money is then paid to third-party contractors to administer efficiency programs.

Wisconsin—Regulated utilities in Wisconsin fund and administer energy efficiency programs through the nonprofit Focus on Energy, overseen by the Public Service Commission. Municipal and cooperative utilities can choose to opt out of Focus on Energy and administer their own programs, and some investor-owned utilities additionally administer voluntary programs.

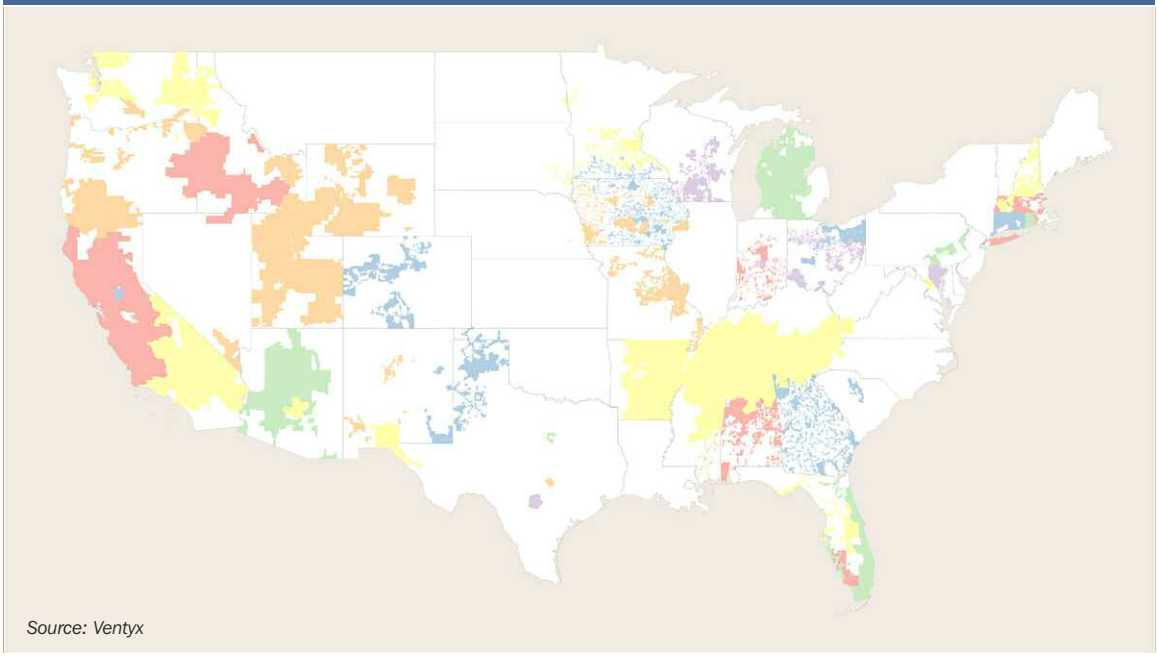
Delaware—Energy efficiency programs in the state are operated by the Delaware Sustainable Energy Utility, as well as by utilities. The Sustainable Energy Utility is a nonprofit under contract with the Delaware Energy Office, and its programs are funded by federal stimulus grants, sales of renewable energy credits, tax-exempt bonds, and other sources.

District of Columbia—Washington, D.C.'s Sustainable Energy Utility administers efficiency programs in the District, supported by the Sustainable Energy Trust Fund, which is funded by ratepayers through a systems benefit charge. Programs are also administered by PEPCO, the District's only regulated distribution utility.

Table 1: Utilities Selected for Energy Efficiency Program Benchmarking

Utility Name	Parent Company/ Common Name	Ownership Type	States of Operation	Census Region	Electricity Deliveries (MWh)	Energy Efficiency Spending (Thousand $)	Incremental Savings (MWh)
Florida Power & Light	NextEra Energy	Investor Owned	FL	South	102,762,272	79,201	154,120
Pacific Gas & Electric	PG&E	Investor Owned	CA	West	85,989,274	409,636	1,592,746
Southern California Edison	Edison International	Investor Owned	CA	West	85,848,831	229,591	1,596,177
Georgia Power	Southern	Investor Owned	GA	South	81,346,510	6,116	44,992
PacifiCorp	MidAmerican	Investor Owned	CA, ID, OR, UT, WA, WY	West	52,785,005	57,063	304,574
Alabama Power	Southern	Investor Owned	AL	South	51,030,063	1,877	19,665
Progress Energy Florida	Progress Energy	Investor Owned	FL	South	37,824,252	26,678	87,049
Consumers Energy	CMS Energy	Investor Owned	MI	Midwest	35,352,060	22,157	133,480
Union Electric	Ameren	Investor Owned	MO	Midwest	35,098,274	13,246	40,030
Northern States Power - Minnesota	Xcel	Investor Owned	MN	Midwest	34,663,593	46,411	319,747
Baltimore Gas & Electric	Constellation	Investor Owned	MD	South	31,576,197	25,513	91,281
Tennessee Valley Authority	Tennessee Valley Authority	Federal	AL, KY, MS, NC, TN	South	30,206,805	22,490	208,222
Arizona Public Service	Pinnacle West	Investor Owned	AZ	West	28,173,296	25,562	208,917
Public Service of Colorado	Xcel	Investor Owned	CO	West	27,359,238	30,257	149,009
Potomac Electric Power	Pepco Holdings	Investor Owned	DC, MD	South	26,549,416	3,077	54,389
Duke Energy Indiana	Duke	Investor Owned	IN	Midwest	26,215,892	2,910	13,486
Salt River Project	Salt River Project	Political Subdivision	AZ	West	26,181,333	20,908	291,887
Wisconsin Power & Light	Alliant Energy	Investor Owned	WI	Midwest	9,858,145	12,837	61,894
Ohio Power	AEP	Investor Owned	OH	Midwest	24,936,379	6,907	132,200
Puget Sound Energy	Puget Holdings	Investor Owned	WA	West	23,896,559	69,621	307,888
Ohio Edison	FirstEnergy	Investor Owned	OH	Midwest	22,856,647	548	515
Connecticut Light & Power	Northeast Utilities	Investor Owned	CT	Northeast	22,265,846	47,413	161,469
Nevada Power	NV Energy	Investor Owned	NV	West	21,436,142	32,354	332,424
Massachusetts Electric	National Grid	Investor Owned	MA	Northeast	20,952,516	90,051	239,815
MidAmerican Energy	MidAmerican	Investor Owned	IA, IL, SD, TX	Midwest	20,424,386	28,834	220,689
City of San Antonio	CPS Energy	Municipal	TX	South	20,026,721	19,970	85,362
Entergy Arkansas	Entergy	Investor Owned	AR	South	19,926,337	4,936	48,050
Duke Energy Ohio	Duke	Investor Owned	OH	Midwest	19,633,388	10,134	63,872
Long Island Power Authority	Long Island Power Authority	State	NY	Northeast	19,271,142	45,953	125,588
Southwestern Electric Power	AEP	Investor Owned	TX	South	16,086,255	3,347	23,786
Interstate Power & Light	Alliant Energy	Investor Owned	IA, MN	Midwest	14,876,474	33,011	161,646
Indianapolis Power & Light	AES	Investor Owned	IN	Midwest	14,085,842	785	958
Idaho Power	IDACORP	Investor Owned	ID, OR	West	13,948,280	20,797	147,540
Metropolitan Edison	FirstEnergy	Investor Owned	PA	Northeast	13,488,679	2,693	3,105
Austin Energy	Austin Energy	Municipal	TX	South	12,035,686	14,864	102,274
Sacramento Municipal Utility District	SMUD	Political Subdivision	CA	West	10,691,907	33,060	148,360
Santee Cooper	Santee Cooper	State	SC	South	10,205,326	5,006	14,154
Omaha Public Power District	Omaha Public Power District	Political Subdivision	NE	Midwest	10,148,466	1,454	23,056
Seattle City Light	Seattle City Light	Municipal	WA	West	9,693,426	30,502	97,594
Mississippi Power	Southern	Investor Owned	MS	South	9,311,852	2,547	2,867
Avista	Avista	Investor Owned	ID, MT, WA	West	8,954,984	17,557	80,830
Public Service of New Mexico	PNM Resources	Investor Owned	NM	West	8,867,533	6,173	38,729
Public Service of New Hampshire	Northeast Utilities	Investor Owned	NH	Northeast	7,749,877	14,929	47,811
Narragansett Electric	National Grid	Investor Owned	RI	Northeast	7,556,300	27,011	79,102
El Paso Electric	El Paso Electric	Investor Owned	NM, TX	South	7,119,683	3,646	19,097
Western Massachusetts Electric	Northeast Utilities	Investor Owned	MA	Northeast	3,643,762	12,430	33,340
Lee County Electric Cooperative	Lee County Electric Cooperative	Cooperative	FL	South	3,517,697	2,522	4,784
Lincoln Electric System	Lincoln Electric System	Municipal	NE	Midwest	3,054,073	1,083	5,224
United Electric Coop Service	United Electric Coop Service	Cooperative	TX	South	1,837,820	108	1,757
Fairfield Electric Cooperative	Fairfield Electric Cooperative	Cooperative	SC	South	603,049	80	1,826

Figure 4: Service Territories of Selected Utilities



Source: Ventyx

The selected utilities serve geographically diverse regions and consist of 37 investor-owned utilities, four municipal utilities, five utilities controlled by states or political subdivisions, three electric cooperatives, and one federal utility.

Benchmarking Electric Energy Efficiency Portfolios

This report benchmarks selected utilities on energy efficiency spending and savings achieved. Specifically, the utilities are ranked based on the following metrics:

- Total energy efficiency expenditures;
- Efficiency expenditures per megawatt-hour of retail sales (relative spending);
- Total incremental savings (i.e., savings from measures implemented during the reporting year); and
- Incremental savings as a percentage of megawatt-hours delivered (relative savings).

These metrics were chosen because they provide a relatively fair assessment of both the absolute and relative status of utility-administered energy efficiency programs, based on available data. In addition, this section discusses the importance of cost-effectiveness as a measure of program success, although currently available data preclude calculating a meaningful cost-effectiveness metric at this time. A detailed description and explanation of the metrics used to benchmark the selected utilities can be found in the "Benchmarking Metrics" section of this report.

The selected utilities are also compared based on the regulatory and policy landscape in which they operate. Utilities do not directly control these factors, but they are critical in determining how aggressively a utility pursues energy efficiency. Such a comparison may be useful in evaluating the relative importance of certain policies for producing robust energy efficiency programs.

Expenditures

One of the most straightforward ways to benchmark energy efficiency programs is to rank budget levels and expenditures by utilities. While it does not capture many of the aspects that are most essential about energy efficiency programs—such as effectiveness—it can provide a gross indicator of program activity. The comparison of total expenditures on energy efficiency is relatively straightforward, and there is general confidence in the accuracy of the data among stakeholders. Simply put, energy efficiency expenditures are the amount of money a utility spends to implement energy efficiency measures, including direct installations and construction, incentives paid to customers, advertising and outreach campaigns, and administrative costs. Although quantity of spending is more or less straightforward to determine, complexities arise in how costs are allocated to different program categories, and when the activities of third-party administrators are considered. See the "Data Quality and Issues" section of this report for a discussion of the issues surrounding allocation of program expenditures.

The metrics calculated and compared in this section are:

- Total efficiency expenditures; and
- Efficiency expenditures per megawatt-hour of retail sales (relative spending).

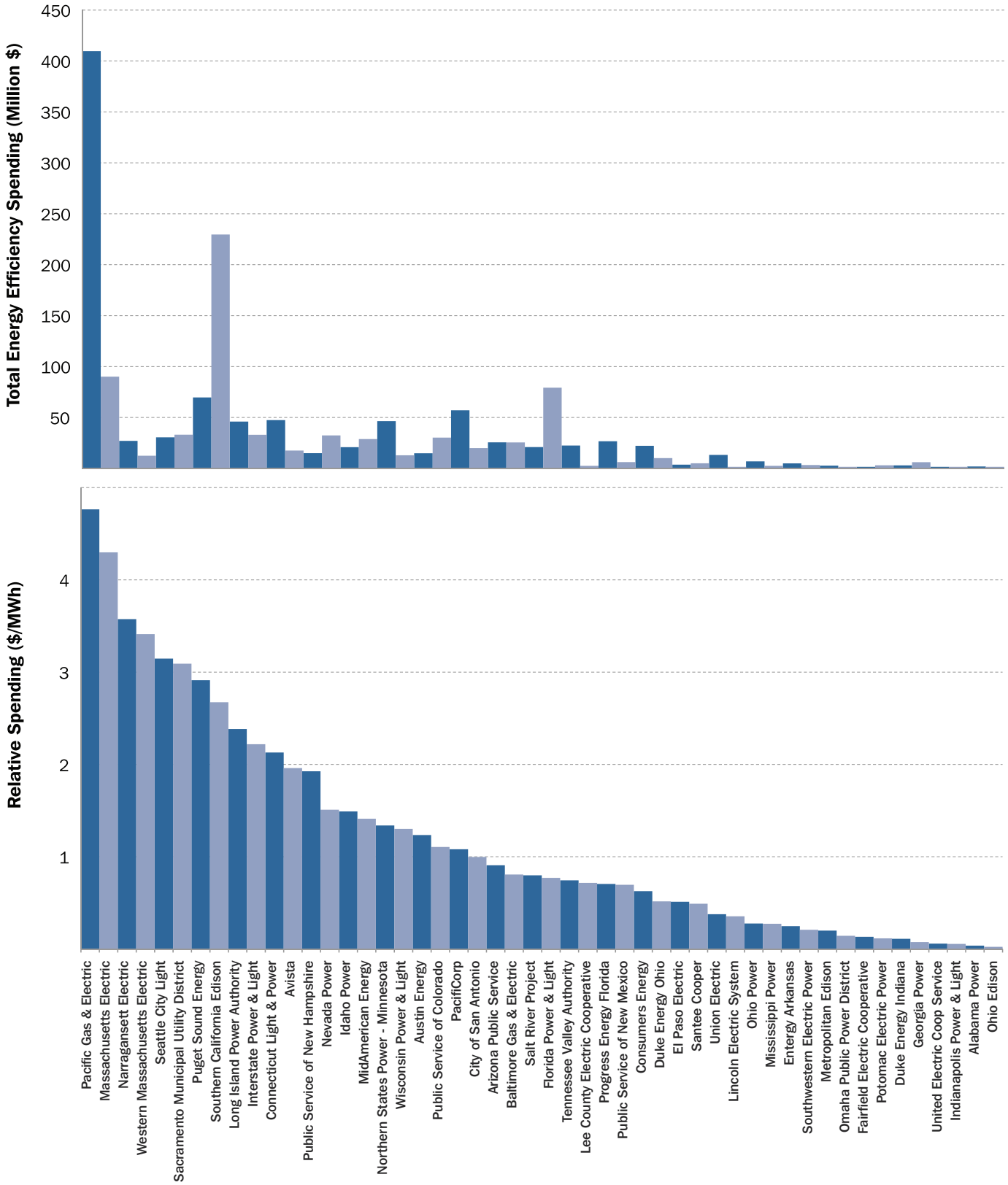
Table 2 and ***Figure 6*** compare the 2009 energy efficiency programs of the selected utilities on these spending metrics.

Table 2: Comparison of Energy Efficiency Spending by Selected Utilities, 2009

Utility Name	Parent Company/Common Name	Relative Spending Rank	Spending Rank	Electricity Deliveries (MWh)	Energy Efficiency Spending (Thousand $)	Relative Spending ($/MWh)*
Pacific Gas & Electric	PG&E	1	1	85,989,274	409,636	$4.76
Massachusetts Electric	National Grid	2	3	20,952,516	90,051	$4.30
Narragansett Electric	National Grid	3	16	7,556,300	27,011	$3.57
Western Massachusetts Electric	Northeast Utilities	4	30	3,643,762	12,430	$3.41
Seattle City Light	Seattle City Light	5	13	9,693,426	30,502	$3.15
Sacramento Municipal Utility District	SMUD	6	10	10,691,907	33,060	$3.09
Puget Sound Energy	Puget Holdings	7	5	23,896,559	69,621	$2.91
Southern California Edison	Edison International	8	2	85,848,831	229,591	$2.67
Long Island Power Authority	Long Island Power Authority	9	9	19,271,142	45,953	$2.38
Interstate Power & Light	Alliant Energy	10	11	14,876,474	33,011	$2.22
Connecticut Light & Power	Northeast Utilities	11	7	22,265,846	47,413	$2.13
Avista	Avista	12	25	8,954,984	17,557	$1.96
Public Service of New Hampshire	Northeast Utilities	13	26	7,749,877	14,929	$1.93
Nevada Power	NV Energy	14	12	21,436,142	32,354	$1.51
Idaho Power	IDACORP	15	23	13,948,280	20,797	$1.49
MidAmerican Energy	MidAmerican	16	15	20,424,386	28,834	$1.41
Northern States Power - Minnesota	Xcel	17	8	34,663,593	46,411	$1.34
Wisconsin Power & Light	Alliant Energy	18	29	9,858,145	12,837	$1.30
Austin Energy	Austin Energy	19	27	12,035,686	14,864	$1.24
Public Service of Colorado	Xcel	20	14	27,359,238	30,257	$1.11
PacifiCorp	MidAmerican	21	6	52,785,005	57,063	$1.08
City of San Antonio	CPS Energy	22	24	20,026,721	19,970	$1.00
Arizona Public Service	Pinnacle West	23	18	28,173,296	25,562	$0.91
Baltimore Gas & Electric	Constellation	24	19	31,576,197	25,513	$0.81
Salt River Project	Salt River Project	25	22	26,181,333	20,908	$0.80
Florida Power & Light	NextEra Energy	26	4	102,762,272	79,201	$0.77
Tennessee Valley Authority	Tennessee Valley Authority	27	20	30,206,805	22,490	$0.74
Lee County Electric Cooperative	Lee County Electric Cooperative	28	43	3,517,697	2,522	$0.72
Progress Energy Florida	Progress Energy	29	17	37,824,252	26,678	$0.71
Public Service of New Mexico	PNM Resources	30	33	8,867,533	6,173	$0.70
Consumers Energy	CMS Energy	31	21	35,352,060	22,157	$0.63
Duke Energy Ohio	Duke	32	31	19,633,388	10,134	$0.52
El Paso Electric	El Paso Electric	33	37	7,119,683	3,646	$0.51
Santee Cooper	Santee Cooper	34	35	10,205,326	5,006	$0.49
Union Electric	Ameren	35	28	35,098,274	13,246	$0.38
Lincoln Electric System	Lincoln Electric System	36	46	3,054,073	1,083	$0.35
Ohio Power	AEP	37	32	24,936,379	6,907	$0.28
Mississippi Power	Southern	38	42	9,311,852	2,547	$0.27
Entergy Arkansas	Entergy	39	36	19,926,337	4,936	$0.25
Southwestern Electric Power	AEP	40	38	16,086,255	3,347	$0.21
Metropolitan Edison	FirstEnergy	41	41	13,488,679	2,693	$0.20
Omaha Public Power District	Omaha Public Power District	42	45	10,148,466	1,454	$0.14
Fairfield Electric Cooperative	Fairfield Electric Cooperative	43	50	603,049	80	$0.13
Potomac Electric Power	Pepco Holdings	44	39	26,549,416	3,077	$0.12
Duke Energy Indiana	Duke	45	40	26,215,892	2,910	$0.11
Georgia Power	Southern	46	34	81,346,510	6,116	$0.08
United Electric Coop Service	United Electric Coop Service	47	49	1,837,820	108	$0.06
Indianapolis Power & Light	AES	48	47	14,085,842	785	$0.06
Alabama Power	Southern	49	44	51,030,063	1,877	$0.04
Ohio Edison	FirstEnergy	50	48	22,856,647	548	$0.02

** Relative spending is calculated as the dollars spent by a utility on energy efficiency per megawatt-hour of electricity delivered to customers and does NOT refer to or imply the cost-effectiveness of a utility's energy efficiency portfolio.*

Figure 6: Selected Utilities by Relative Spending



Impacts

The overall goal of energy efficiency programs is to reduce the quantity of electricity consumed by end-use consumers in order to reduce energy bills, generate associated economic benefits, and reduce emissions of greenhouse gas and other air pollutants. Therefore, comparing efficiency programs based on how much electricity they save is a critical component of the benchmarking process. At a high level, ranking efficiency programs based on their energy savings identifies the most successful programs and policies, and can also highlight effective savings measures, program approaches, and generally promote identification and adoption of industry best practices. Furthermore, quantifying energy savings enables analysis of the economic and environmental benefits achieved through bill savings and emission reductions. Ultimately, these are the impacts that matter when evaluating efficiency programs as an energy resource.

The metrics calculated and compared in this section are:

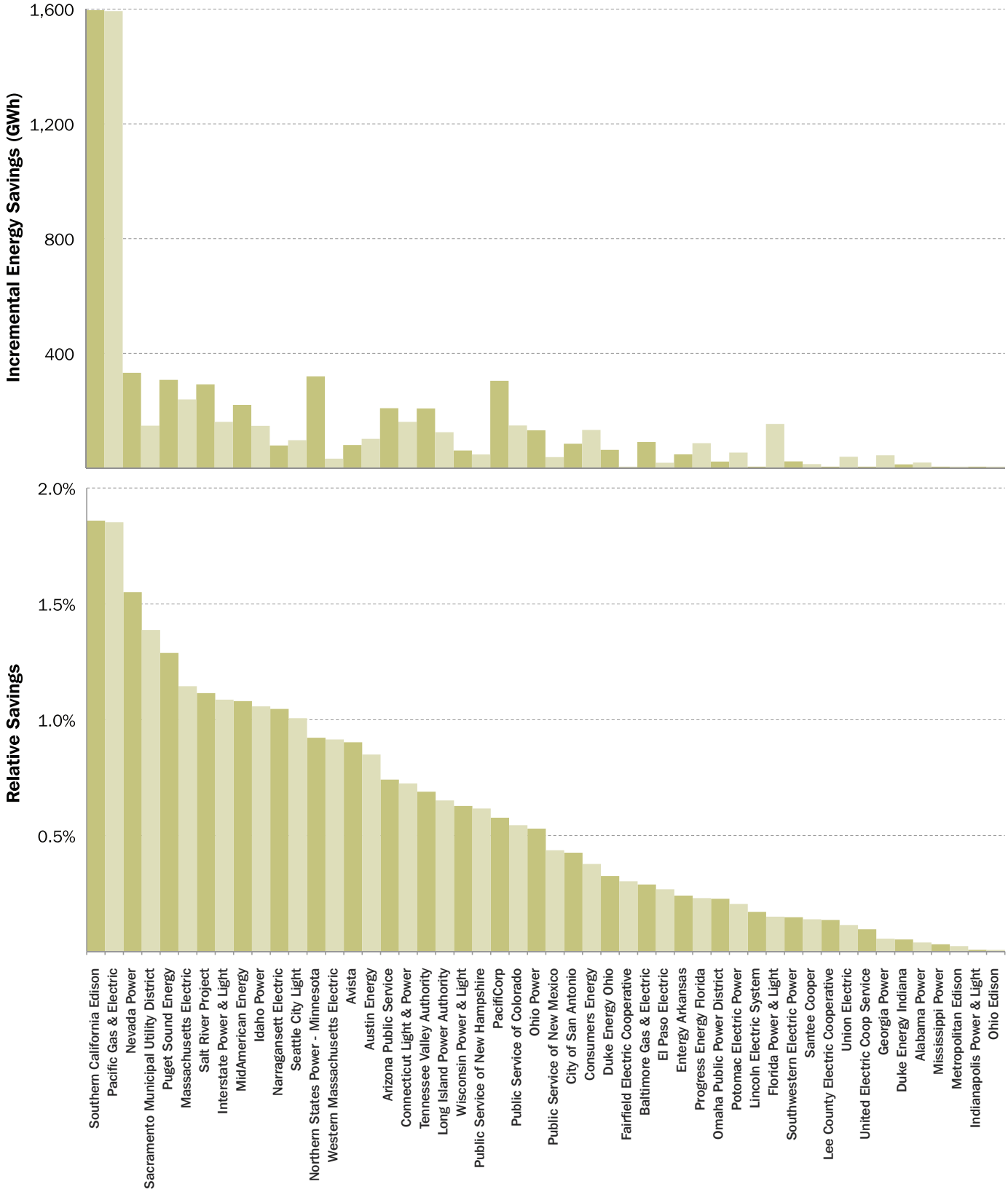
- Savings achieved by energy efficiency programs (incremental savings); and
- Incremental savings as a percent of retail electric sales (relative savings).

Table 3 and ***Figure 7*** compare the 2009 energy savings achieved by selected utilities.

Table 3: Comparison of Energy Savings by Selected Utilities, EIA 2009

Utility Name	Parent Company/Common Name	Relative Savings Rank	Savings Rank	Electricity Deliveries (MWh)	Incremental Savings (MWh)	Relative Savings (%)
Southern California Edison	Edison International	1	1	85,848,831	1,596,177	1.9%
Pacific Gas & Electric	PG&E	2	2	85,989,274	1,592,746	1.9%
Nevada Power	NV Energy	3	3	21,436,142	332,424	1.6%
Sacramento Municipal Utility District	SMUD	4	16	10,691,907	148,360	1.4%
Puget Sound Energy	Puget Holdings	5	5	23,896,559	307,888	1.3%
Massachusetts Electric	National Grid	6	8	20,952,516	239,815	1.1%
Salt River Project	Salt River Project	7	7	26,181,333	291,887	1.1%
Interstate Power & Light	Alliant Energy	8	12	14,876,474	161,646	1.1%
MidAmerican Energy	MidAmerican	9	9	20,424,386	220,689	1.1%
Idaho Power	IDACORP	10	17	13,948,280	147,540	1.1%
Narragansett Electric	National Grid	11	27	7,556,300	79,102	1.0%
Seattle City Light	Seattle City Light	12	22	9,693,426	97,594	1.0%
Northern States Power - Minnesota	Xcel	13	4	34,663,593	319,747	0.9%
Western Massachusetts Electric	Northeast Utilities	14	36	3,643,762	33,340	0.9%
Avista	Avista	15	26	8,954,984	80,830	0.9%
Austin Energy	Austin Energy	16	21	12,035,686	102,274	0.8%
Arizona Public Service	Pinnacle West	17	10	28,173,296	208,917	0.7%
Connecticut Light & Power	Northeast Utilities	18	13	22,265,846	161,469	0.7%
Tennessee Valley Authority	Tennessee Valley Authority	19	11	30,206,805	208,222	0.7%
Long Island Power Authority	Long Island Power Authority	20	20	19,271,142	125,588	0.7%
Wisconsin Power & Light	Alliant Energy	21	29	9,858,145	61,894	0.6%
Public Service of New Hampshire	Northeast Utilities	22	32	7,749,877	47,811	0.6%
PacifiCorp	MidAmerican	23	6	52,785,005	304,574	0.6%
Public Service of Colorado	Xcel	24	15	27,359,238	149,009	0.5%
Ohio Power	AEP	25	19	24,936,379	132,200	0.5%
Public Service of New Mexico	PNM Resources	26	35	8,867,533	38,729	0.4%
City of San Antonio	CPS Energy	27	25	20,026,721	85,362	0.4%
Consumers Energy	CMS Energy	28	18	35,352,060	133,480	0.4%
Duke Energy Ohio	Duke	29	28	19,633,388	63,872	0.3%
Fairfield Electric Cooperative	Fairfield Electric Cooperative	30	47	603,049	1,826	0.3%
Baltimore Gas & Electric	Constellation	31	23	31,576,197	91,281	0.3%
El Paso Electric	El Paso Electric	32	40	7,119,683	19,097	0.3%
Entergy Arkansas	Entergy	33	31	19,926,337	48,050	0.2%
Progress Energy Florida	Progress Energy	34	24	37,824,252	87,049	0.2%
Omaha Public Power District	Omaha Public Power District	35	38	10,148,466	23,056	0.2%
Potomac Electric Power	Pepco Holdings	36	30	26,549,416	54,389	0.2%
Lincoln Electric System	Lincoln Electric System	37	43	3,054,073	5,224	0.2%
Florida Power & Light	NextEra Energy	38	14	102,762,272	154,120	0.1%
Southwestern Electric Power	AEP	39	37	16,086,255	23,786	0.1%
Santee Cooper	Santee Cooper	40	41	10,205,326	14,154	0.1%
Lee County Electric Cooperative	Lee County Electric Cooperative	41	44	3,517,697	4,784	0.1%
Union Electric	Ameren	42	34	35,098,274	40,030	0.1%
United Electric Coop Service	United Electric Coop Service	43	48	1,837,820	1,757	0.1%
Georgia Power	Southern	44	33	81,346,510	44,992	0.1%
Duke Energy Indiana	Duke	45	42	26,215,892	13,486	0.1%
Alabama Power	Southern	46	39	51,030,063	19,665	0.0%
Mississippi Power	Southern	47	46	9,311,852	2,867	0.0%
Metropolitan Edison	FirstEnergy	48	45	13,488,679	3,105	0.0%
Indianapolis Power & Light	AES	49	49	14,085,842	958	0.0%
Ohio Edison	FirstEnergy	50	50	22,856,647	515	0.0%

Figure 7: Selected Utilities by Relative Savings



Cost-Effectiveness

Cost-effectiveness is another important measure to compare the results of energy efficiency efforts. For individual efficiency measures, the quantity of electricity saved over the useful life of the project, per dollar spent, demonstrates how long it takes to recoup the capital investment in the measure and determines whether or not the investment makes economic sense. At a portfolio level, calculating cost-effectiveness allows comparison between administrators to determine which are achieving savings at the lowest cost and obtaining the most net economic benefits for their customers, as well as cost comparisons between efficiency programs and supply-side resources.

Benchmarking cost-effectiveness is necessary to identify best practices, as well as to identify programs that are not achieving benefits commensurate with their expenditures. However, there is currently no comprehensive, publicly available dataset that contains the necessary information for calculating cost-effectiveness. Because energy efficiency spending results in savings that are realized over the course of multiple years, the most important component for calculating a meaningful cost-effectiveness metric for efficiency programs would be an estimate of the projected lifecycle savings of all the measures implemented in a given year.

While a relative cost-effectiveness metric may be calculated using the quantity of spending and savings in a given year, concerns with the accuracy of the energy savings data further reduce confidence in the results of any cost-effectiveness calculations from this data source.

State Policies

Without policy changes directed at supporting energy efficiency, utilities are unlikely to invest significant resources in energy efficiency, due to the inherent disincentives created by the classic utility business model. Therefore, state policies are a major driving force behind the expansion of cost-saving utility energy efficiency programs. This report considers the following policies for each selected utility and for each state in which it operates:

- Decoupling of electricity revenues from sales, or similar mechanisms, to remove throughput disincentives;
- Shareholder incentives for utilities that successfully implement efficiency programs; and
- Mandatory savings targets (e.g. EERS).

Importantly, many of the states that have achieved the highest savings with utility efficiency programs, such as California and Massachusetts, have established all three policies—revenue decoupling, a binding efficiency savings goal, and performance incentives.

Table 4: Utility Incentives Scoring Methodology

Criteria	Available Points
Decoupling has been implemented for at least one electric utility.	1
Performance incentives have been implemented for at least one utility.	1
Decoupling has been authorized but not implemented.	0.5
Performance incentives have been authorized but not implemented.	0.5
Alternative lost revenue recovery mechanism has been authorized or implemented.	0.5

Table 5: Energy Savings Targets Scoring Methodology

Percent Savings Target	Score
1.5% or greater	4
1% - 1.49%	3
0.5% - 0.99%	2
0.1% - 0.49%	1
First Resource Requirement	1
Less than 0.1%	0

Tables 4 and *5* describe how each state was scored based on the policies in place in 2009 according to ACEEE's 2009 State Energy Efficiency Scorecard. The scoring methodologies were also derived from ACEEE's Scorecard, but were altered to apply only to electric utility policies. Based on these methodologies, states can earn a maximum score of six (6).

Table 6 compiles information on utility polices that were in place by state in 2009, including those that were authorized by the state's legislature or PUC, but were not yet implemented for any utilities. Although the table may not accurately reflect the exact policy landscape for each utility in this report, it is intended to illustrate the policies available by state that might influence energy efficiency investments by electric utilities. *Table 7* ranks the selected utilities based on the average score received by each of the states in which the utility operates, weighted by the electricity deliveries by state.

Figures 8 and 9 below chart the relationship between the weighted average policy score for the selected utilities and relative spending and savings, respectively, while highlighting top performers in both spending and savings. Figure 8 identifies utilities with relative spending of $2.00 per megawatt-hour of deliveries or greater. Figure 9 identifies utilities with relative savings of at least 1.0 percent of deliveries.

Figures 8 and 9 indicate that there is a relationship between the efficiency policy regime under which a utility operates and both the level of energy efficiency investment and reported savings. The charts show that as the weighted average policy score of a utility rises, the relative spending by that utility and the relative savings achieved tend to rise as well. States with the most supportive policy regimes have put these policies in place over many years, and states just starting out will gradually and selectively implement energy efficiency policies over time. But these data show that significant energy efficiency savings are possible even with relatively modest policy regimes. However, additional statistical analysis would be required in order to determine the strength of the relationship of spending and savings to policies and what other variables might also help explain the data.

Table 6: 2009 State Utility Policy Scores

State	Policy Score	Decoupling (or similar)	Performance Incentives	Average Annual Savings Target
Alaska	0	No	No	None
Alabama	0	No	No	None
Arkansas	0	No	No	None
Arizona	1	No	Yes	None
California	5	Yes	Yes	0.9%
Colorado	4	No	Yes	1.0%
Connecticut	4.5	Authorized	Yes	1.0%
District of Columbia	1.5	Yes	Authorized	None
Delaware	4.5	Authorized	No	2.5%
Florida	0.5	No	Authorized	None
Georgia	1.5	LRR*	Yes	None
Hawaii	4.5	Authorized	Yes	1.0%
Iowa	4	No	No	1.5%
Idaho	2	Yes	Yes	None
Illinois	3	No	No	1.2%
Indiana	0.5	No	Authorized	None
Kansas	0.5	No	Authorized	None
Kentucky	1.5	LRR*	Yes	None
Louisiana	0	No	No	None
Massachusetts	5.5	Authorized	Yes	2.4%
Maryland	4	Yes	No	1.5 - 1.8%
Maine	2	Authorized	Authorized	First Resource ^
Michigan	3	Authorized	Authorized	0.3%, increasing to 1% in 2012
Minnesota	5.5	Authorized	Yes	1 - 1.5%
Missouri	0.5	No	Authorized	None
Mississippi	0	No	No	None
Montana	1	LRR*	Authorized	None
North Carolina	2.5	LRR*	Yes	Up to 0.25% in 2012
North Dakota	0	No	No	None
Nebraska	0	No	No	None
New Hampshire	1	No	Yes	None
New Jersey	0	No	No	None
New Mexico	3	Authorized	Authorized	0.7%
Nevada	3.5	LRR*	Yes	0.6%
New York	6	Yes	Yes	1.9%
Ohio	3.5	LRR*	Yes	1.3%
Oklahoma	1.5	LRR*	Yes	None
Oregon	1	Yes	No	None
Pennsylvania	3	No	No	1.0%
Rhode Island	4	No	Yes	1.05%
South Carolina	1.5	LRR*	Yes	None
South Dakota	1	No	Yes	None
Tennessee	0	No	No	None
Texas	2	No	Yes	0.3%
Utah	1	Authorized	Authorized	None
Virginia	0.5	No	Authorized	None
Vermont	6	Yes	Yes	2.0%
Washington	3	No	Yes	1.0%
Wisconsin	2	Yes	Yes	None
West Virginia	0	No	No	None

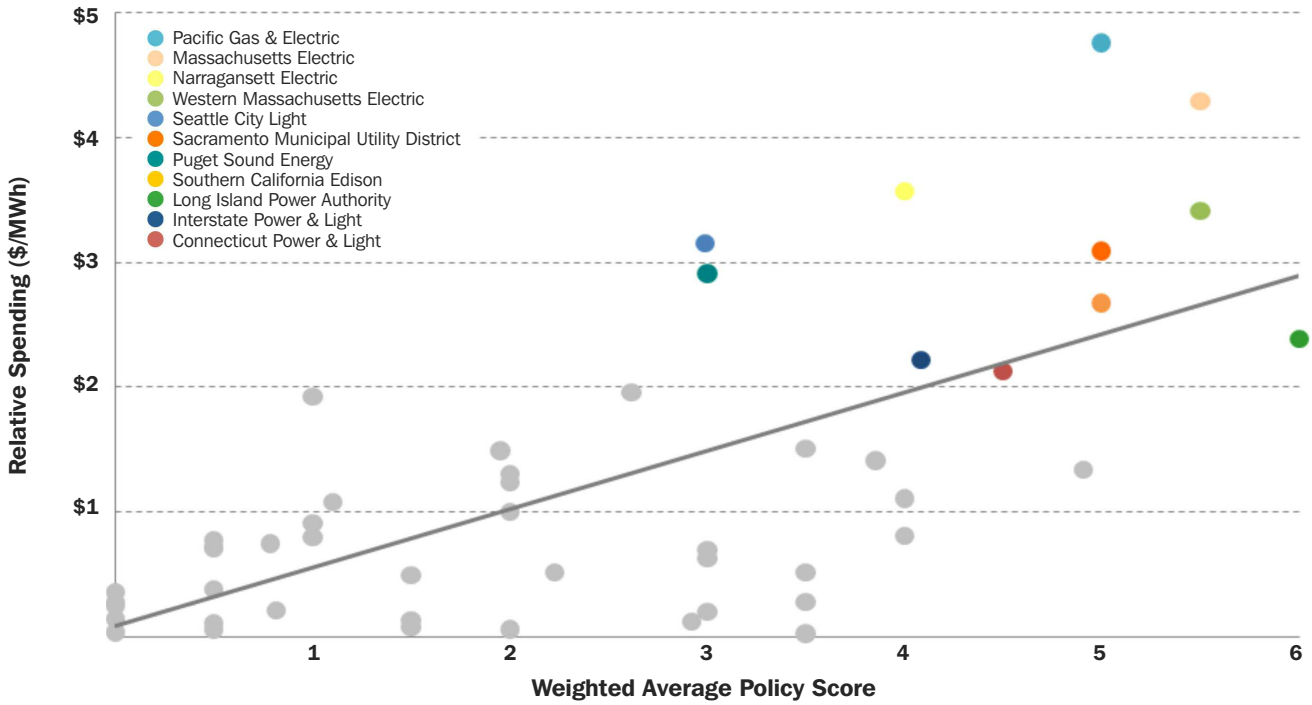
* LRR—Alternative lost revenue recovery mechanism in place rather than decoupling.
^ First Resource—Requirement for energy efficiency to serve as the first priority resource in utility planning.
Source: American Council for an Energy-Efficient Economy, "The 2009 State Energy Efficiency Scorecard." October 2009. Note: Adjustments were made to ACEEE's 2009 Scorecard. See Appendix for details.

Table 6 compiles information on utility polices that were in place by state in 2009, including those that were authorized by the state's legislature or PUC, but were not yet implemented for any utilities. Although the table may not accurately reflect the exact policy landscape for each utility in this report, it is intended to illustrate the policies available by state that might influence energy efficiency investments by electric utilities.

Table 7: Selected Utilities by 2009 Weighted Average Policy Score

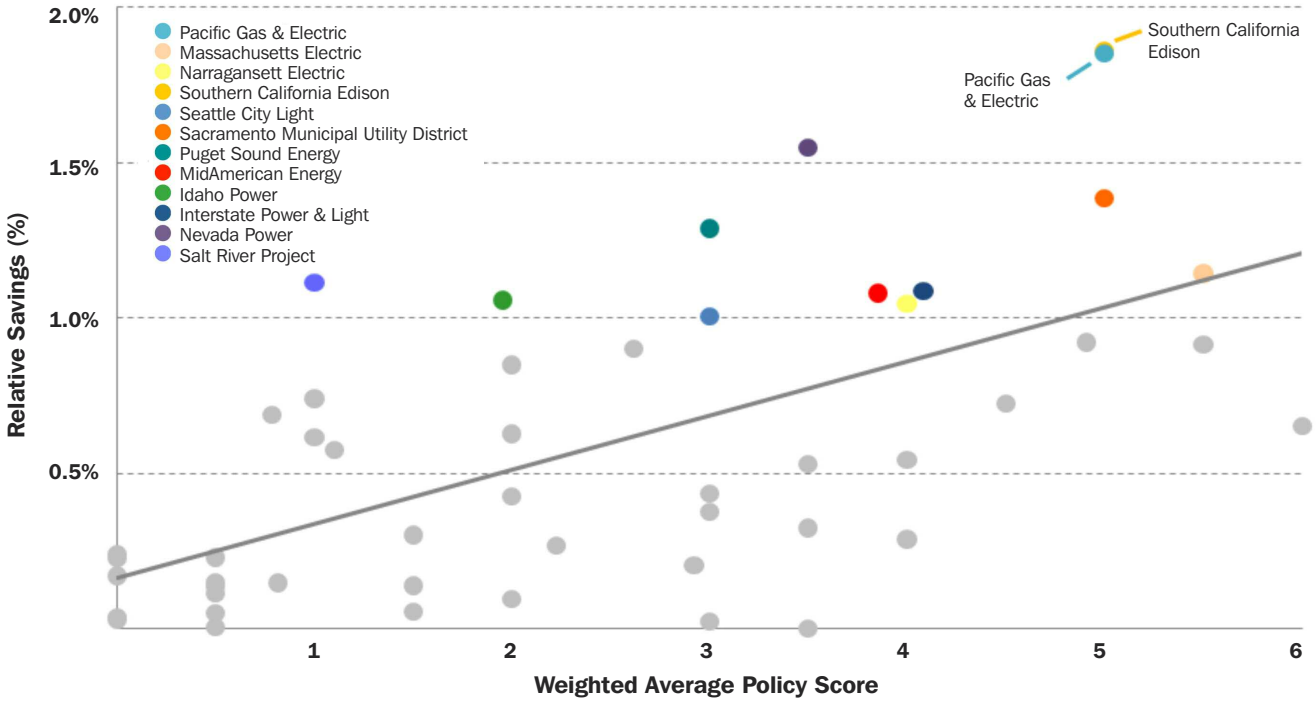
Utility	Parent Company/Common Name	Ownership Type	Census Region	Weighted Policy Score	Relative Spending ($/MWh)	Relative Savings (%)
Long Island Power Authority	Long Island Power Authority	State	Northeast	6.0	$2.38	0.65%
Massachusetts Electric	National Grid	Investor Owned	Northeast	5.5	$4.30	1.14%
Western Massachusetts Electric	Northeast Utilities	Investor Owned	Northeast	5.5	$3.41	0.91%
Pacific Gas & Electric	PG&E	Investor Owned	West	5.0	$4.76	1.85%
Sacramento Municipal Utility District	SMUD	Political Subdivision	West	5.0	$3.09	1.39%
Southern California Edison	Edison International	Investor Owned	West	5.0	$2.67	1.86%
Northern States Power - Minnesota	Xcel	Investor Owned	Midwest	4.9	$1.34	0.92%
Connecticut Light & Power	Northeast Utilities	Investor Owned	Northeast	4.5	$2.13	0.73%
Interstate Power & Light	Alliant Energy	Investor Owned	Midwest	4.1	$2.22	1.09%
Narragansett Electric	National Grid	Investor Owned	Northeast	4.0	$3.57	1.05%
Public Service of Colorado	Xcel	Investor Owned	West	4.0	$1.11	0.54%
Baltimore Gas & Electric	Constellation	Investor Owned	South	4.0	$0.81	0.29%
MidAmerican Energy	MidAmerican	Investor Owned	Midwest	3.9	$1.41	1.08%
Nevada Power	NV Energy	Investor Owned	West	3.5	$1.51	1.55%
Duke Energy Ohio	Duke	Investor Owned	Midwest	3.5	$0.52	0.33%
Ohio Power	AEP	Investor Owned	Midwest	3.5	$0.28	0.53%
Ohio Edison	FirstEnergy	Investor Owned	Midwest	3.5	$0.02	0.00%
Seattle City Light	Seattle City Light	Municipal	West	3.0	$3.15	1.01%
Puget Sound Energy	Puget Holdings	Investor Owned	West	3.0	$2.91	1.29%
Public Service of New Mexico	PNM Resources	Investor Owned	West	3.0	$0.70	0.44%
Consumers Energy	CMS Energy	Investor Owned	Midwest	3.0	$0.63	0.38%
Metropolitan Edison	FirstEnergy	Investor Owned	Northeast	3.0	$0.20	0.02%
Potomac Electric Power	Pepco Holdings	Investor Owned	South	2.9	$0.12	0.20%
Avista	Avista	Investor Owned	West	2.6	$1.96	0.90%
El Paso Electric	El Paso Electric	Investor Owned	South	2.2	$0.51	0.27%
Wisconsin Power & Light	Alliant Energy	Investor Owned	Midwest	2.0	$1.30	0.63%
Austin Energy	Austin Energy	Municipal	South	2.0	$1.24	0.85%
City of San Antonio	CPS Energy	Municipal	South	2.0	$1.00	0.43%
United Electric Coop Service	United Electric Coop Service	Cooperative	South	2.0	$0.06	0.10%
Idaho Power	IDACORP	Investor Owned	West	2.0	$1.49	1.06%
Santee Cooper	Santee Cooper	State	South	1.5	$0.49	0.14%
Fairfield Electric Cooperative	Fairfield Electric Cooperative	Cooperative	South	1.5	$0.13	0.30%
Georgia Power	Southern	Investor Owned	South	1.5	$0.08	0.06%
PacifiCorp	MidAmerican	Investor Owned	West	1.1	$1.08	0.58%
Public Service of New Hampshire	Northeast Utilities	Investor Owned	Northeast	1.0	$1.93	0.62%
Arizona Public Service	Pinnacle West	Investor Owned	West	1.0	$0.91	0.74%
Salt River Project	Salt River Project	Political Subdivision	West	1.0	$0.80	1.11%
Southwestern Electric Power	AEP	Investor Owned	South	0.8	$0.21	0.15%
Tennessee Valley Authority	Tennessee Valley Authority	Federal	South	0.8	$0.74	0.69%
Florida Power & Light	NextEra Energy	Investor Owned	South	0.5	$0.77	0.15%
Lee County Electric Cooperative	Lee County Electric Cooperative	Cooperative	South	0.5	$0.72	0.14%
Progress Energy Florida	Progress Energy	Investor Owned	South	0.5	$0.71	0.23%
Union Electric	Ameren	Investor Owned	Midwest	0.5	$0.38	0.11%
Duke Energy Indiana	Duke	Investor Owned	Midwest	0.5	$0.11	0.05%
Indianapolis Power & Light	AES	Investor Owned	Midwest	0.5	$0.06	0.01%
Lincoln Electric System	Lincoln Electric System	Municipal	Midwest	0.0	$0.35	0.17%
Mississippi Power	Southern	Investor Owned	South	0.0	$0.27	0.03%
Entergy Arkansas	Entergy	Investor Owned	South	0.0	$0.25	0.24%
Omaha Public Power District	Omaha Public Power District	Political Subdivision	Midwest	0.0	$0.14	0.23%
Alabama Power	Southern	Investor Owned	South	0.0	$0.04	0.04%

Figure 8: Policy Score Comparison by Relative Spending



Note: Figure 8 identifies utilities with relative spending of $2.00 per megawatt-hour or greater.

Figure 9: Policy Score Comparison by Relative Savings



Note: Figure 9 identifies utilities with relative savings of 1.0% or greater.

Regional Updates

Total ratepayer-funded energy efficiency program spending in the U.S. is projected to increase from $5.4 billion in 2009 to $12.4 billion per year in 2020. Much of this increase will be focused in states that have historically been minor participants in energy efficiency initiatives and where new policies are being enacted to support this growth.[23] As a result of this rapid ramp-up in energy efficiency programs, the time lag in EIA data excludes a significant portion of utility energy efficiency spending and savings. Following are several examples of utilities that have recently launched programs or made long-term plans that are not reflected in EIA's 2009 dataset.

Northeast

Since 2009, the Northeast, a well-established efficiency leader, has taken several leaps forward towards aggressive investment in low-cost efficiency resources. Massachusetts' electric utilities, including NSTAR (which did not report energy efficiency data to EIA in 2009), National Grid, Western Massachusetts Electric (a Northeast Utilities subsidiary), and the municipal aggregator the Cape Light Compact, will invest more than $8.00 per MWh of retail electricity sales in efficiency (a new utility program investment high-water mark) and achieve single year savings of 2.4 percent of annual electricity sales in 2012. In Rhode Island, Narragansett Electric (a National Grid subsidiary) will achieve single year savings of 2.1 percent and 2.5 percent of annual electric efficiency program savings in 2013 and 2014 respectively. Connecticut has also established pioneering efficiency policies, including all cost-effective procurement requirements for electric and natural gas efficiency, and Connecticut Light & Power has preliminarily proposed saving 2 percent of annual electric energy consumption through their efficiency programs in 2012.

Southeast

TVA has pledged to become a leader in energy efficiency in the Southeast, recently committing to achieve 3.5 percent of sales in energy efficiency savings by 2015. Achievements in FY10 toward the new goal resulted in 211 GWh of energy savings. In FY11, TVA plans to save 550 GWh, more than twice the savings reported the Authority reported to EIA in 2009.[24] Georgia Power's 2010 integrated resource plan also includes a more prominent role for demand side management and energy efficiency with spending in 2012 ramping up to $21.2 million, and in 2013, spending would increase to $27.8 million. Arkansas' Public Service Commission passed a Sustainable Energy Resource Action Plan in December 2010. The plan establishes electric energy efficiency targets relative to 2010 sales of 0.25 percent in 2011, 0.5 percent in 2012, and 0.75 percent in 2013. The plan also includes natural gas reduction targets. In North Carolina and South Carolina, both Duke Energy and Progress Energy reported better-than-expected results from energy efficiency programs in 2010, achieving higher energy savings at lower costs while collectively reducing customers' electricity usage by more than 700 million kWh.

Midwest

In 2008, the Ohio General Assembly passed Amended Substitute SB 221, an omnibus energy bill which included an energy efficiency standard that ramps up to 1 percent annual savings by 2014 and 2 percent by 2019. This new law has led Ohio utilities, which have traditionally had limited energy efficiency portfolios, to significantly increase their investment and achievement in energy efficiency. Ohio Power and Duke Energy Ohio both surpassed the 2010 benchmark of 0.5%, achieving annualized savings of 167 GWh[25] (0.7%) and 311 GWh[26] (1.4%), respectively. Ohio Edison, however, saved only 59 GWh (0.3%) in 2010[27], below its statutory benchmark, although the Commission lowered the benchmark requirements for the company provided that it meet a three-year cumulative savings requirement of 2 percent from 2010-2012. Illinois utilities Commonwealth Edison and Ameren have been ramping up energy efficiency efforts since 2008 and will likely achieve 0.8 percent of annual electricity savings in 2011. Michigan established an energy efficiency target in 2008 that ramps up to 1 percent annual savings which the state's electric utilities, including Consumers Energy and Detroit Edison, have successfully met. With a new energy efficiency standard approved by the Indiana Utility Regulatory Commission that ramps up to 2% annual savings, Indiana will begin administering energy efficiency programs in 2012 supplemented by programs from electric utilities such as Vectren, Duke Energy, Indianapolis Power and Light, NIPSCO, and AEP.

Mid-Atlantic

Pennsylvania utilities have made enormous strides in energy efficiency implementation due to Act 129, which sets energy targets for the state's electric utilities. Metropolitan Edison reported gross savings of 176 GWh in its second program year (June 2010 to May 2011), an enormous increase over its 2009 EIA-reported savings of only 3 GWh.[28]

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Mountain West

PacifiCorp has completed a new Integrated Resource Plan (IRP) for its multi-state service area that includes Utah and Wyoming. The new IRP contains considerably greater energy efficiency and load management resources than PacifiCorp's previous IRP.[29] Also, beginning January 1, 2009, PacifiCorp received approval from the Wyoming Public Service Commission to implement six DSM programs for residential, commercial and industrial customers over four years. PacifiCorp anticipates spending about $25 million on these programs and saving 138 GWh per year by 2013.[30] Additionally, under a settlement agreement with the Colorado Public Utilities Commission and other interested parties, Public Service Colorado (Xcel) will be spending up to $196 million on its demand-side management programs through 2013.[31]

West

A number of states in this region have made significant policy commitments to energy efficiency as a resource, which are reflected in their utilities' resource plans, and several states are encouraging their utilities to ramp up energy efficiency programs.[32] Pacific Gas and Electric (PG&E's) 2009-2011 energy efficiency plan provides for an aggressive ramp-up of multifaceted programs in the residential, commercial, and industrial markets, with a proposed total portfolio budget for years 2009-2011 of $1.8 billion. PG&E's projected savings between 2009 and 2011 includes a cumulative target of 4,941 GWh in energy savings.[33] In November 2010, the Oregon Public Utility Commission approved Portland Gas and Electric's (PGE) 2009 Integrated Resource Plan, which includes 214 average megawatts of energy efficiency measures, which PGE expects will offset nearly half its load growth through 2020.[34] As of August 2006, four utilities in the Western U.S. (PSE, PG&E, SCE, and SDG&E), proposed energy-efficiency programs in their resource plans that projected to offset more than 70 percent of their forecasted energy load growth between 2004 and 2013. Specifically, Avista projected an 83 percent decline in projected load growth from energy-efficiency programs.

As of August 2006, four utilities in the Western U.S. (PSE, PG&E, SCE, and SDG&E), proposed energy-efficiency programs in their resource plans that projected to offset more than 70 percent of their forecasted energy load growth between 2004 and 2013.

Southwest

In May 2011, the Public Utilities Commission of Nevada approved about $58 million in local energy-efficiency program costs for NV Energy (of which Nevada Power Company is a subsidiary), allowing the company to invest in promoting power-conservation measures at homes and businesses.[35] Nevada's recently amended renewable energy portfolio standard allows energy efficiency to be used in partial fulfillment of its portfolio requirements. In addition, The Salt River Project Board of Directors unanimously approved revisions to their Sustainable Portfolio Principles (SPPs). The revised SPPs establish annual energy efficiency savings targets of 1.5 percent (FY 2012-2014), 1.75 percent (FY 2015-2017), and 2.0 percent (FY 2018-2020).[36]

Data Sources, Issues, and Quality

Data on U.S. ratepayer-funded energy efficiency programs are available to the public through the Energy Information Administration (EIA), various regulatory filings with state authorities, and voluntary industry and company reporting. Each of these sources comes with its own set of shortcomings, pitfalls, and caveats.

Sources

EIA-861

Form EIA-861 collects information on the entities involved in transmission, distribution, and marketing of electricity in the United States. The data collected on this form are used to monitor the current status and trends of the electric power industry and to evaluate the future of the industry.[37] EIA-861 includes data on utility-administered demand-side management (DSM) programs.

The DSM data from EIA-861 include program expenditures and effects (energy savings) associated with utility programs. DSM program expenditures are broken down into direct utility costs, incentive payments to customers, and indirect costs (administration, marketing, monitoring and evaluation, and utility-earned incentives).

EIA reporting is mandatory, and as such, these data are fairly comprehensive in terms of scope. However, EIA-861 data take time to be submitted, compiled and released; as such, the most recent data available at any given time date to the year before the previous year. Because energy efficiency programs are rapidly developing across the nation, this prevents comparing the latest in energy efficiency programs.

The issues with EIA-861 have been noted and discussed by multiple observers.[38,39] Nonetheless, the EIA-861 survey remains the most suitable data source for benchmarking electric utility efficiency programs, and stakeholders such as the State and Local Energy Efficiency Action Network EM&V Working Group have offered suggestions for improving it, including: revising certain definitions to conform with industry standards, improving the clarity and simplicity of the reporting process, and supporting independent verification of reported data.

CONSORTIUM FOR ENERGY EFFICIENCY

The Consortium for Energy Efficiency (CEE) collects data on energy efficiency programs through a voluntary annual survey of its member utilities. The survey solicits information on program spending, future budgets, and savings achieved. CEE partly remedies the time lag problem inherent in the EIA-861 by collecting data on both past year spending and subsequent year budgets, allowing a more up-to-date look at program expenditures. On the other hand, based on a comparison of CEE-reported budgets for 2009 and the actual spending data reported the next year by CEE, actual expenditures sometimes vary from reported budgets, indicating that budgets are not always a reliable way to benchmark utilities.

Although CEE's members have expanded in recent years, along with response rates to the annual survey, this remains a voluntary effort. Therefore, CEE data cover fewer utilities than EIA. Furthermore, CEE does not publicly release data on energy savings on an individual utility level, which limits the usefulness of this resource for benchmarking purposes.

REGULATORY FILINGS

Regulated utilities that recover the costs of administering energy efficiency programs through rates must report their expenditures to the public utility commission (PUC) that determines their rates, in order to "true up" their expenditures with the amount of money they collect from customers. Utilities are also often required to file future budgets for PUC approval or for rate-setting purposes. In addition, utilities subject to regulatory requirements for energy efficiency programs, whether in regulated or deregulated states, must report data to regulatory bodies to verify compliance. Many municipal or cooperative utilities that are not subject to state-based rate oversight or efficiency requirements report energy efficiency data voluntarily in other types of reports. However, regulatory filings and other reports are often difficult to track down, and have issues with comparability—many utilities report their spending over a fiscal year that does not match the calendar year, for example, in addition to the EM&V issue discussed in the "Benchmarking Challenges" section.

Issues

SPENDING

A significant problem with EIA spending data is the way costs are apportioned to energy efficiency and load management. While direct and incentive costs are reported separately for energy efficiency and load management, the category "indirect costs" merges indirect costs for both, making it difficult to accurately distinguish total costs between energy efficiency and load management. In order to assign a portion of indirect spending to efficiency programs, this report allocates indirect costs proportionally between energy efficiency and load management efforts based on total direct spending in these categories.

Furthermore, EIA does not provide clear guidance on how program costs should be allocated among direct and indirect measures. Utilities vary considerably in what they report as indirect versus direct spending, depending on the guidelines in each state. This is confirmed through data checks of selected utilities.

IMPACTS

Form 861, EIA collects data on the incremental and annual energy savings and peak load impacts of utility-administered DSM programs, but the definitions of these data elements limit their usefulness for benchmarking. EIA defines incremental energy effects as the change in megawatt-hours of energy consumption that results from new participants in existing programs and all participants in new programs that began during the reporting year. Utilities are instructed to annualize these impacts in order to estimate the savings that would have occurred if all measures had been implemented on January 1 of the reporting year.

Annual savings are defined as the total change in megawatt-hour energy use from all participants in both new and existing programs. EIA instructs utilities to consider the useful life of efficiency measures "to the extent possible," but provides no further guidance on this issue. Additionally, Form 861 requests that utilities use actual savings achieved by new participants and program, rather than the annualized estimates included for incremental savings, if possible, but the database does indicate whether utilities reported real or projected annualized savings.

Importantly, annual savings should not be confused with, and are not a proxy for, estimates of "lifecycle" savings from the efficiency measures implemented in the reporting year. Annual savings are heavily dependent on the duration of a utility's energy efficiency program, in addition to funding levels and effectiveness. In contrast, lifecycle savings can be defined as the total reduction in energy consumption achieved by an energy efficiency measure over the entire useful life of that measure.

Although EIA's definitions, such as that of "annual savings," are not well recognized throughout the energy efficiency industry, this report relies on them to avoid confusion.

In addition to the definitional problems discussed above, there is a great deal of fundamental uncertainty about the energy savings reported by utilities. EIA provides little guidance on how to estimate the impacts of DSM programs for Form-861. Therefore, utilities may rely on a variety of methodologies for evaluating energy savings, which raises significant issues about the comparability of data submitted to EIA.

COST-EFFECTIVENESS

The data necessary for calculating cost-effectiveness, as well as actual calculations of cost-effectiveness tests, frequently appear in regulatory filings and other company reports. However, EIA-861 does not include lifecycle savings, which are required to calculate the true cost of energy saved. Energy savings arising from an efficiency measure are not realized all at once; up-front spending leads to savings that are realized over the course of multiple years.

It would be possible to calculate the cost of energy saved in the first year of a program being implemented by dividing energy efficiency expenditures by incremental savings, which, at least in theory, represent the annualized savings resulting from the expenditures in the program year. But because these savings do not represent the total energy saved over the lifetime of a program, this would not result in a true measure of the cost spent to save a unit of energy. Additionally, concerns with the accuracy of the energy savings data further reduce confidence in the results of any cost-effectiveness calculations from this data source.

Quality

To determine the accuracy of EIA's spending and impacts data, efforts were made to cross-check figures with state regulatory filings and public reports. Spending figures were also compared to CEE data for utilities that responded to the annual survey. CEE collects but does not publicly release data on an energy savings achieved. Results of this data-checking effort were mixed.

Although CEE spending figures were generally close to those reported to EIA, this was not always the case. In some cases, this was due to utilities using a different reporting year for CEE as opposed to EIA (which uses the calendar year), but in others, the reason for the disparity was unclear.

PUC filings and other public reports—which were available for approximately 65 percent of the selected utilities in various forms—presented numerous comparability issues. First, the reporting year over which expenditures were measured varied even more widely for PUC filings and company reports than in CEE data. For example, Metropolitan Edison reported data for "Program Year 1," which ran from June 2009 to May 2010, and Austin Energy reported over a fiscal year from October 2009 to September 2010. Second, many utilities, including Entergy Arkansas, provided spending figures that included efficiency and load management in a single sum, making it impossible to determine how much spending went towards energy efficiency alone.

Comparability was also an issue when verifying savings data. About half of the filings and reports contained savings estimates for the reporting year that were within 10 percent of the incremental figure included in EIA-861. The remaining reports typically contained only estimates of lifecycle energy savings. Additionally, as with program spending, some utilities file their annual reports for activity over a fiscal year or other time period, which caused several inconsistencies.

These issues did not account for the total variation in figures between company reports and EIA data, however, indicating that there may be errors in the EIA data, or potentially just that accounting practices vary between how utilities report their spending to regulatory bodies and to EIA.

Benchmarking Metrics

This section discusses a number of potential metrics for benchmarking energy efficiency programs based on spending, impacts, and cost-effectiveness, along with the advantages and disadvantages of each. Many of the best metrics for comparing energy efficiency programs could not be calculated using available data. Therefore, the metrics that were selected for this initial round of benchmarking are not necessarily those that should be used going forward, once data quality is improved.

Spending

Total spending can demonstrate the gross magnitude of energy efficiency program expenditures. Because spending on energy efficiency varies based on the resources available to the utility, it is also useful to compare spending using metrics that account for utility size. The following are three possible ways to normalize utility spending by size:

1. ***Efficiency spending per customer***—This metric normalizes for size to an extent, but can also be distorted by utilities that primarily serve large industrial customers (these utilities have high revenues and energy sales, but low customer counts).
2. ***Efficiency spending per electric revenues***—This metric shows the percent of a utility's revenues that it spends on energy efficiency, and has the advantage of comparing the same unit (dollars to dollars). However, due to wide variation in electric rates across the nation, some utilities of similar size have very different revenues, distorting this metric.
3. ***Efficiency spending per electric sales***—This metric is perhaps the least biased of the three, and the one we use in our analysis, although varying electricity consumption between utility territories, due to climatic or other factors, will affect this variable.

There are a number of spending metrics that would also be informative, but for which data are currently not widely or accurately available. For instance:

1. ***Customer contribution and total resource cost***—Although utilities sometimes pay for the entirety of an energy efficiency measure, more often, consumers must pay their own way with some assistance from the utility. Including customer contribution gives a better idea of the total volume of efficiency activity, and comparing it to utility contribution demonstrates to what degree the program depends on customer spending. In addition, total resource cost (customer contribution and utility contribution combined) is an ideal metric for determining cost-effectiveness, because it takes into account the entire cost of a measure. This information is not collected by EIA or CEE, but is sometimes included in PUC filings or other reports.

2. ***Spending by category***—Spending on energy efficiency can generally be divided into money directly paid to customers as incentives, money directly paid to construct or install energy efficiency measures, and other costs such as marketing and outreach and administrative overhead. Comparing these categories can show whether programs are putting most of their funding towards actual implementation of energy efficiency measures, or whether it is being spent mainly on administration or marketing. EIA breaks down costs into direct and incentive costs for both efficiency and load management, and has a category for indirect costs that includes both efficiency and load management. However, the guidance EIA gives on how to apportion costs into these categories is not extensive, and it is likely that utilities use varying methods to allocate their spending. Because of the perceived inaccuracy of this metric, we elected not to include it in our report.
3. ***Spending by customer class***—Efficiency programs are usually designed to target a specific type of customer class: generally either residential, commercial or industrial. Many utilities also target programs specifically to low-income customers. These metrics can identify the breadth of programs offered, and identify where programs are lagging in targeting certain customer opportunities. CEE provides breakdowns of spending into residential, commercial and industrial, low-income, and other, and also includes what percent of spending is used for evaluation, measurement, and verification (EM&V)—but as previously mentioned, the utilities we intended to measure were not all included in CEE's data.

Impacts

Below are two potential metrics that could be used to compare the impacts of existing energy efficiency programs:

1. ***Annual savings as a percent of sales***—This metric can serve as a proxy for the percentage of a utility's load that is met using energy efficiency. This percentage might also be interpreted as the contribution of energy efficiency to a utility's overall resource mix. While this metric controls for utility size, there is considerable uncertainty over the baseline year used by utilities. Furthermore, differences in accounting and assumptions over the useful life of efficiency measures could skew the results.
2. ***Incremental savings as a percent of sales***—Calculating incremental savings as a percent of total sales provides a better snapshot of a utility's current efficiency programs. This metric may be interpreted as a proxy for reductions in load growth. EERS programs often define utility requirements in terms of some sort of incremental savings goal. Incremental savings percent is the least biased metric that is calculable using the EIA-861.

Several additional impacts measures and metrics would enhance the effort to benchmarking efficiency programs, but limited or unreliable data prevent their use. These include:

1. ***Lifecycle savings***—An estimate of the lifecycle savings from energy efficiency measures implemented in the reporting year would significantly enhance the power of benchmarking these programs. Estimates of the full lifetime impact of efficiency measures are necessary for calculating the true cost of energy efficiency per kilowatt-hour saved. The cost of lifecycle savings would serve as a measure of cost-effectiveness and allow for more accurate comparisons to supply-side resources.

2. ***Savings per program participant***—Energy savings per program participant is a measure of effectiveness. It disregards the size of utilities and focuses on the benefits to the consumers that take advantage of energy efficiency programs.
3. ***Energy bill savings***—Energy bill savings can be estimated using annual savings and average electric utility rates by customer class. However, this metric would be skewed towards larger utilities with long-standing programs and relatively high rates.
4. ***Energy or bill savings per customer***—Calculating energy or bill savings per customer seeks to control for the size of utilities when comparing impacts. However, as with spending, this metric would favor utilities that serve primarily large industrial customers. Furthermore, calculating bill savings per customer would be biased towards utilities with high rates, similar to the measure of total bill savings.
5. ***Emissions savings***—One co-benefit of energy efficiency that is receiving increased state and federal attention is the potential environmental co-benefits of energy efficiency, including emission reductions. In some states, utilities estimate the emissions savings as a component of annual reports on their efficiency programs. Another potential application of such data is use in State Implementation Plans (SIPs) that are submitted to EPA for compliance with air quality regulations. EPA recently issued preliminary guidance to assist states in quantifying the emissions impacts of renewable energy and energy efficiency for inclusion in SIPs.[40]

Cost-Effectiveness

There are three main approaches to determining cost-effectiveness of energy efficiency programs: cost of saved energy, cost-benefit ratio, and net benefits. Cost of saved energy measures the amount of money spent (by the utility, the consumer, or both) to save a unit of energy. This metric allows comparison of utilities to one another, as well as comparison of the cost of saved energy to the costs of supply-side resources. Cost of saved energy can be calculated by dividing the cost of implementing an energy efficiency measure or program by the lifecycle energy savings realized by that program.[41]

Cost-benefit ratio compares the cost of an energy efficiency measure (again, to the utility, the consumer, or both) to the monetary value of the benefits to the ratepayer, utility, and/or society realized by implementing it. "Net benefits" is a similar metric, and is calculated by subtracting the total cost of a program from its monetized benefits. These metrics allow stakeholders to determine whether the monetary benefits of an energy efficiency program outweigh the costs, and the quantity of benefits they are providing to the consumer.

Data Recommendations

Publicly available energy efficiency data do not currently meet the needs of stakeholders seeking to compare utilities by spending, energy savings, or cost-effectiveness. Either EIA or CEE could readily fill this data void through a few simple but fundamental changes to their existing data collection framework. A more robust, comprehensive, and public dataset would facilitate future benchmarking efforts and provide stakeholders with more useful information regarding the effectiveness of energy efficiency programs.

The recommendations below are meant to assist future data collection efforts, by EIA, CEE, or other organizations. Adhering to these guidelines and recommendations would address many of the issues confronted during the development of this report and facilitate greater engagement among stakeholders.

1. ***Provide clear guidelines on cost apportionment, and separate efficiency and load management.*** If project costs are divided into categories such as direct, incentive, and indirect, clear guidance should be given as to what expenditures belong in what category. No costs for efficiency and load management programs should be listed together, if possible, and spending on electric and natural gas programs should also be separate.
2. ***Include detailed spending information.*** Including spending by customer class, spending on low-income programs, and customer spending would allow a deeper understanding of utility programs, better cost-effectiveness comparisons, and easier identification of undeveloped opportunities.
3. ***Require reporting of future budgets.*** Given that utility energy efficiency programs are rapidly ramping up across the nation, inclusion of future budgets would allow comparison of utilities that have not yet begun programs, or whose programs are scheduled to change dramatically in the future.
4. ***Provide clear guidance for estimating efficiency savings.*** Clear guidance for how to estimate energy savings from efficiency measures would ensure that comparisons between utilities are valid.
5. ***Include estimates of lifecycle savings.*** Lifecycle savings from energy efficiency are critical for determining the full impact of measures and programs. While lifecycle estimates for current year efforts necessarily depend on a range of assumptions, clear guidance on estimation methods would ensure a consistent approach and improve comparability. Guidelines on lifecycle estimates could be included in a broader effort to update reporting requirements.
6. ***Require utilities to report the number of program participants by class.*** While less integral than other recommendations, this would facilitate more in-depth analysis of program effectiveness and consumer benefits.
7. ***Collect data on third-party administrators.*** Collecting detailed data on programs administered by third parties, including which utilities' customers are served and funding provided by each utility, would enable more direct comparisons between third-party and utility-administered programs.
8. ***Publicly release all administrator-level data.*** In order to increase transparency and facilitate stakeholder involvement, all administrator-level data should be publicly released. This would allow stakeholders to conduct independent analyses of the data and draw conclusions to move the policy discussion forward.

Endnotes

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