BEFORE THE PUBLIC SERVICE COMISSION
OF THE STATE OF MISSOURI

In the Matter of the Integrated Resource	**)**	
Plan of KCP&L General Missouri	**)**	
Operations Company	**)**	**File No. EO-2012-0324**

MISSOURI DEPARTMENT OF NATURAL RESOURCES,
DIVISION OF ENERGY COMMENTS IN RESPONSE TO
KCP&L GREATER MISSOURI OPERATION COMPANY'S
INTEGRATED RESOURCE PLAN FILING

Filed September 6, 2012

PUBLIC VERSION

****DENOTES HIGHLY CONFIDENTIAL INFORMATION****

Table of Contents

Table of Tables

Table of Figures

Introduction

The Missouri Department of Natural Resources (MDNR), acting as an intervener in File No. EO-2012-0324, submits the attached comments on KCP&L Greater Missouri Operations Company's (GMO) Integrated Resource Planning (IRP) compliance filing dated April 15, 2012. GMO's filing was submitted pursuant to requirements of 4 CSR 240-22.

MDNR submits these comments pursuant to 4 CSR 240-22.080(6) and (8), which provide that: "…within one hundred twenty (120) days after an electric utility's compliance filing… any intervener may file a report or comments based on a limited review that identify any deficiencies in the electric utility's compliance with the provisions of this chapter, any deficiencies in the methodologies or analyses required to be performed by this chapter, and any other deficiencies which…the intervener believes would cause the utility's resource acquisition strategy to fail to meet the requirements identified in 4 CSR 240-22.010(2)(A)–(C)… [The parties] shall work with the electric utility…to reach, within forty-five (45) days of the date that the report or comments were submitted, a joint agreement on a plan to remedy the identified deficiencies."

In MDNR's view, the process established by 4 CSR 240-22.080(6) - (8) should provide an opportunity for comprehensive review of the utility's resource planning process and resource acquisition strategy.

MDNR prepared these comments with the assistance of the consulting firm GDS Associates, Inc. (GDS). GDS provided a report on GMO's IRP filing which focuses on issues related to load forecast, weather normalized energy sales, potential double counting of DSM impacts, the combined KCP&L and /KCP&L-Greater Missouri Operations (GMO) planning approach, fuel prices, consideration of natural disasters, the relationship between power plant capacity factors and renewable resources in the preferred plan, and various issues regarding wind resources. The consultant's report is being filed simultaneously with MDNR's report and is referenced herein as the "GDS report."

The compliance filing materials submitted by GMO on April 15 consist of nine volumes and numerous appendices. MDNR's comments focus on deficiencies and concerns with respect to GMO's load forecasting, its supply side analysis, its demand side analysis, the construction and analysis of its alternative resource plans, and its use of a combined-company planning approach. Finally, this report discusses the deficiencies and concerns in GMO's analysis of selected special contemporary issues established in File No.EO-2012-0042.

Issues that MDNR classifies as "concerns" are not necessarily less significant than issues that MDNR classifies as "deficiencies." MDNR classified issues as "deficiencies" or "concerns" primarily on the basis of how explicitly the issues are tied to specific provisions of the Chapter 22 rules.

In making its comments, MDNR reviewed the following sources of information:

- The nine primary narrative volumes and appendices included in GMO's April 15, 2012 Integrated Resource Plan (IRP) filing, references by the volume or appendix number assigned by GMO;
- Accompanying workpapers distributed to MDNR by GMO as part of its April 15, 2012 filing, referenced by the file name assigned by GMO;
- GMO responses to MDNR data requests, referenced by data request number; and
- Stipulation and Agreement to File No. EE-2009-0237, GMO's 2009 IRP.

MDNR staff participated in stakeholder meetings that GMO convened on December 19, 2011, May 11, 2012 and July 27, 2012. Subject matter experts from GDS participated in portions of these meetings. MDNR wishes to emphasize that while its comments have been informed by these meetings, they are based on the contents of the documents filed in File No. EO-2012-0324 and the documents listed above.

MDNR proposes remedies for each of the deficiencies and concerns listed in this report. The proposed remedies are offered for consideration by the parties during the 45-day review period provided by 4 CSR 240-22.080(8). The majority of the remedies request that GMO provide the analyses required by the Chapter 22 rules, particularly with respect to the combined company planning effort used to determine GMO's preferred plan. Although MDNR is not proposing a specific stakeholder process at this time, several of MDNR's proposed remedies refer to consultation with stakeholders on the assumption that stakeholder meetings will occur in the context of the upcoming annual review of GMO's planning effort.

General Concerns

Concern #1. GMO did not request waivers for its DSM analysis or Combined Plan Analysis.

GMO did not request waivers to address omissions in its DSM analysis or to address the use of a combined company planning process.

Rule Citation

4 CSR 240-22.080(13)

Discussion

The current IRP rules provide a mechanism for a utility to request waivers from various rule requirements:

> Upon written application made at least twelve (12) months prior to a triennial compliance filing, and after notice and an opportunity for hearing, the commission may waive or grant a variance from a provision of 4 CSR 240-22.030–4 CSR 240-22.080 for good cause shown. (4 CSR 240-22.080(13))

GMO did not request any waivers in the current case. Review of the submitted volumes indicates that there was "good cause" to request waivers in at least two areas, the background analyses of demand-side resources in Volume 5, and the assessment of critical uncertain factors and contingency planning using "combined company plans" in Volumes 6 and 7.

With regard to the analysis of demand-side resources in Volume 5, many of the required analyses were postponed pending the completion of KPC&L/GMO's Market Potential Study, scheduled for completion in January, 2013. KCP&L and GMO proposed conducting a market potential study well before the preparation of the current IRP plan. The Company was aware that the anticipated completion date of its market potential study was after the filing date of its 2012 IRP. In Volume 5 of its plan, KCP&L cites the signed statement of work for the potential study (appendix 5a navigant_sow_signed_01162012.pdf) multiple times as explanation for missing DSM analyses required by the rules. For example, the statement of work for the market potential study is cited in response to 4 CSR 22.050 (1) (E) 2, 4 CSR 22.050 (3) (G)3, 4 CSR 22.050 (3)(G)5B, 4 CSR 22.050 (3) (I), 4 CSR 22.050 (4)(D), and 4 CSR 22.050 (6)(C). The Company was aware that the background analysis necessary to complete Volume 5 would not be available. Nevertheless, the Company did not request waivers for the rules cited above. The consequence is that important requirements of the rules, for example, the specification of "maximum achievable potential" and "realistic achievable potential" (see 4 CSR 240-22.020(40), 4 CSR 240-22.020(49), 4 CSR 240-22.050(2), 4 CSR 240-22.050(3)(G)5.B, 4 CSR 240-22.050(4)(D)5.A, 4 CSR 240-22.050 (6)(C)1) was not completed.

Another area where a waiver request would have been appropriate was the Company's decision to estimate 14 alternative resource plans that combine KCP&L and GMO's supply side resources on a company-wide basis.[1] The Company based its assessment of critical uncertain

---

[1] It is important to note that the sixteen "combined" plans listed in Tables 6 and 7 of Volume 6 (pp.15-16) combine supply-side resources only. These combined plans include one DSM Portfolio, "DSM A", which is described as "'DSM A' consists of a suite of twelve Energy Efficiency and two Demand Response programs that GMO considers the capacity and energy estimated from these programs comprise realistically achievable levels. On December 22, GMO submitted its MEEIA application. However, the DSM proposed in the MEEIA filing was used to develop the

factors and its contingency planning in Volume 7 using the two combined plans with the lowest NPVRR. In Volume 7, GMO describes its preferred plan as:

> For GMO, the Preferred Plan and the Contingency Plan are the allocated components of the lowest-cost and contingency plans from the combined company study. GMO Preferred Plan ACCG9 is the GMO allocated portion of combined company plan AJDC2. GMO Contingency Plan ACCG8 is the GMO allocated portion of combined company plan AGDC2. Complete descriptions of the GMO plans are located in the response to Rule 240-22.060(3) in Volume 6 of this filing. Complete descriptions of the combined company plans are located in the response to Rule 240-22.060(3)8 in Volume 6 of this filing. (20)

GMO's decision to engage in a combined planning process and to base its selection of a company-specific preferred plan and contingency plan through allocation, rather than direct estimation are sufficiently different from the rules to require waivers documenting both the construction of the combined plans and allocation process.

In both cases, MDNR is concerned that important analyses have not been conducted by the Company and these omissions limit our ability to fairly assess GMO's planning process.

Deficiencies and Concerns for 4 CSR 240-22.030

Deficiency #1. Inadequate model specification in load analysis and load forecasting.

In estimating the effect of weather on electric loads, the functional form of the models was not specified and neither were the goodness of fit measures reported for statistical models.

<u>Rule Citation</u>

4 CSR 240-22.030(2)(C)3 and 4 CSR 240-22.030(3)(B)

<u>Discussion</u>

4 CSR 240-22.030(2)(C)3 and 4 CSR 240-22.030(3)(B) require the utility to document the model specification when estimating the effect of weather on electric loads. These models are

'DSM A' by assuming the programs begin in 2014. For 2012 and 2013, the DSM A consists of Persistence DSM and contractually obligated Demand Response." (Volume 6, p. 6) In its combined plans the Company relied only on the DSM A portfolio and modeled the minimal renewable resources necessary to meet the existing renewable energy standard. This left the supply side resources as the only resources allowed to vary across plans and between companies.

provided on pages 8 to 12 of Volume 3. The Company failed to fully specify the form of the models used to weather normalize its load forecast. It is unclear if the functional form the models is exponential, cubic or something else. While the results show the coefficients, standard errors, t-statistics and coefficient P-value, measures of model goodness of fit, such as R-squared values are not included in the results. Without knowledge of the model specification, it is very difficult to understand the relationship between the explanatory variables and the dependent variable. Further, without knowledge of goodness of fit measures, it is not practical to determine if the model fits the data accurately. In evaluating most of the weather normalization models, variables assessing trends in energy use are not statistically significant at the 95% level; therefore, one cannot be confident about their contributions to the model. Also, see GDS' comments (Concern #2) regarding the reliability of GMO's weather normalization models.

Potential Remedy

In its annual update, GMO should elaborate on the assumptions, functional form used in the equations to estimate the effect of weather on system loads and report the R-squared statistic and other goodness of fit measures to comply with the rule. GMO should investigate if there are any other variables that can better explain the weather trends or consider using non-linear models as an estimation technique.

Deficiency #2. **Overly optimistic forecast of household growth.**

In Moody's forecast of economic activity may overestimate the growth in the number of households in the Kansas City metropolitan area.

Rule Citation

4 CSR 240-22.030(3)(A)

Discussion

4 CSR 240-22.030(3)(A) requires the utility to identify appropriate explanatory variables as predictors of the number of units for each major class and GMO chose households as a unit.

GDS' analysis, cited in Concern #1 of its report, suggests that the estimates of the number of households used by GMO may be problematic. In particular, the growth rate in the number of households may be too high, given the long effects of the current economic situation.

Potential Remedy

In its annual update, GMO should recalibrate its forecast of the number of households to reflect the existing economic situation.

Deficiency #3. **Improper model specification in the analysis of number of units.**

The weather normalization regression models used are not properly specified. No rationale provided for the choice of autoregressive models or the inclusion of specific month dummy variables.

Rule Citation

4 CSR 240-22.030(3)(A) and 4 CSR 240-22.030(3)(B)

Discussion

4 CSR 240-22.030(3)(A) and 4 CSR 240-22.030(3)(B) requires the utility to identify and document the explanatory variables used in its weather normalization regression models. The models estimated employ autoregressive trend variables and dummy variables. The trend variables apparently account for previous months' energy consumption. The dummy variables control for energy use in specific months and years of the time period.

The Company provided no explanation of its choice of model form or its decision to control for energy usage in specific months. No rationale is provided for the choice of autoregressive models, and it is unclear whether the Company tested the fit of second-order and third-order autoregressive models before deciding on the model's form. There is no indication that other models, such as autoregressive moving average models or autoregressive integrated moving average models were tested.

Finally, there's no explanation for the inclusion of specific month dummy variables in the regression models. These dummies likely control for unique monthly conditions, for example, a variable controlling for energy use in December, 2006 is included in several models. However, there is no rationale provided for controlling for energy use in some months versus others.

Potential Remedy

In its annual update, GMO needs to provide a rationale for the use of first-order autoregressive models, specify the model and explain why autoregressive moving average or autoregressive integrated moving average models were not used, especially in the wake of using time-series models. Use of specific monthly variables need to be justified in the modeling process and any tests results for serial correlation and stationarity need to be reported.

Deficiencies and Concerns for 4 CSR 240-22.040

Deficiency #4. **Estimates of natural gas prices were used in the fuel price forecasts are consistently high.**

Natural gas prices used in fuel price forecasts are consistently high.

Rule Citation

4 CSR 240-22.040(5)(A)

Discussion

4 CSR 240-22.040(5)(A) requires the utility to develop a fuel price forecast for coal, natural gas, fuel oil and uranium. The natural gas prices used for this analysis were consistently higher than the base case forecast for natural gas prices published in the United States Department of Energy's Annual Energy Outlook for 2011(AEO2011). Table 1 (HC) compares the forecast natural gas prices at the Henry Hub from the AEO2011 to the forecast values used by GMO. The "Mid" and "High" forecasts used by GMO were higher than the AEO2011 base case in each year of the IRP forecast. The "Low" forecast used by GMO is higher than the AEO2011 base case for the seven years between 2012 and 2019.

Natural gas prices have dropped sharply owing to the hydraulic fracturing and development activity in several shale formations in the country. The utility forecasted the prices of natural gas to be very high starting in 2012 and increasing over time.

Potential Remedy

In view of the glut of natural gas in the market, the utility might consider to adjust the prices down to represent the market price to accurately forecast the natural gas prices.

Table 1: Natural Gas Price Forecasts, GMO vs. AEO2011 (HC)

**

[redacted]

Concern #2. Compliance with alternative Missouri renewable energy standard.

GMO addressed its attempts to comply with the current Missouri renewable energy standard (RES) or Proposition C. However, the IRP does not discuss the compliance with the potentially modified or newly proposed renewable energy standard

Rule Citation

4 CSR 240-22.010, 4 CSR 240-22.020(28), 4 CSR 240-22.060(5)

Discussion

In its IRP analysis, GMO considers a number of renewable options, in particular solar and wind, as a separate group in the supply side analysis. In order to meet RES requirement, some renewable options would be passed onto the integrated resource analysis regardless of their costs. Over past few years, a number of legislative bills had been introduced in the state capitol to either modify the existing RES law or propose a new RES. In addition, a new ballot initiative was proposed by Renew Missouri early this year to change several provisions in the current RES. Although all efforts so far have failed due to various reasons, it is still likely that the current RES law may be changed sometime in the IRP planning horizon. As one of an array of uncertain factors, future potential changes in the RES, such as changes in the definition eligible renewable energy resources, percentage requirements of particular energy resources and geographical sourcing, will have significant impacts on renewable energy resources selection and acquisition with the associated costs. That will also affect the selection of preferred plan and contingent plan in the integrated resource planning even though KCP&L separates renewable energy technologies from other supply-side resource options.

Potential remedy

GMO should investigate the impact of at least one alternative RES by modeling the scenario based on the recent Missouri legislative proposals or Renew Missouri's 2012 ballot initiative.

Concern #3. Inadequate exploration of distributed generation technologies in screening supply-side resources.

GMO inadequately analyzes the role of distributed generation technologies, in particular combined heat and power (CHP), in its screening analysis of potential supply-side resources.

Rule Citation

4 CSR 240-22.020(15), 4 CSR 240-22.040(1), 4 CSR 240-22.040(4)

Discussion

As the advancement of distribution technologies accelerates, they may play a more visible role in resource resources acquisition during the 20-year planning horizon. While GMO explained that it will use the results from KCP&L's SmartGrid Demonstration Project and subsequent benefit cost analyses to determine its cost effectiveness in its response to the MDNR DR 21, limited documentation exists that demonstrates KCP&L adequately considered distributed generation, as defined in 4 CSR 240-22.020(15), in its screening analysis of potential supply side resources. GMO investigated residential and commercial solar, but it did not include other types of distribution technologies in its assessment. Multiple distributed technologies exist at both commercial and near-commercial stages, such as small wind, microturbines, internal combustion engines. Considering the future price of natural gas, more natural gas fuelled microturbines and internal combustion engines might be cost-effective at the commercial and institutional levels. In particular, the feasibility of combined heat and power (CHP) installations, using either fossil fuels (most likely natural gas) or renewables (solid biomass or biogas from wastewater treatment facilities) should be analyzed more fully, especially in its additional role as a demand side resource.

Potential remedy

In its annual update, GMO should provide a more detailed analysis of the market status of a number of distribution technologies as well as their potential impacts. GMO should also explore more opportunities with customer-side CHP.

Deficiencies and Concerns for 4 CSR 240-22.050

Deficiency #5. **No clear analysis of interactive factors in assessing DSM program cost-effectiveness.**

Analysis of the interactive effects of efficiency measures was not performed in the estimation of program cost-effectiveness.

Rule Citation

4 CSR 240-22.050(3)(G)2

Discussion

4 CSR 240-22.050 (3)(G)2 requires GMO to provide "An assessment of how the interactions between end-use measures, when bundled with other end-use measures in the potential demand-side program, would affect the stand-alone end-use measure impact estimates." The rules indicate that this analysis should be conducted for the twenty-year planning horizon and inform the cost-effectiveness of each potential demand-side program.

There is no indication that any interactive effects have been addressed in the assessment of the cost-effectiveness of individual programs in either Volume 5 or "GMO_Program Cost-Effectiveness_HC 240-22.050.xlsx" in the workpapers. In Volume 5 "interactive effects" are discussed with respect to a single appliance, the purchase of an Energy Star refrigerator (see pp. 64-65).

Additionally, GMO's response to MDNR DR 30, which asked the Company to "identify those for which the GMO analysis reflects 'interactive effects' and describe and document the specific interactive effects that were incorporated into the analysis", noted that "[i]nteractive effects are not directly incorporated into the analysis."

Potential Remedy

Interactive effects of efficiency measures are a common feature of utility and statewide technical resource manuals. For example, the Mid-Atlantic Technical Reference Manual (Version 2.0, July 2011, pages 16 and 17) presents waste heat factor calculations showing the impact of installation of efficient lighting on heating and cooling costs. Such values are publically available and could have be used in assessing the cost-effectiveness of programs that combine lighting retrofits with cooling retrofits, such as the Home Performance with Energy Star or C&I Prescriptive programs.

These interactive effects should be included in the assessment of future programs. The program-level cost-effectiveness measures should be recalculated after the completion of the market potential study.

Deficiency #6. **No identification of DSM portfolios that address "maximum achievable potential" and "realistic achievable potential."**

GMO has deferred all estimation and analysis of "maximum achievable potential" and "realistic achievable potential" to the completion of its market potential study.

Rule Citations

4 CSR 240-22.020(40), 4 CSR 240-22.020(49), 4 CSR 240-22.050(2), 4 CSR 240-22.050(3)(G)5.B, 4 CSR 240-22.050(4)(D)5.A, 4 CSR 240-22.050 (6)(C)1

Discussion

The rules cited above require that DSM portfolios meet specific characteristics. GMO has chosen not to specify DSM portfolios that meet the requirements of either the "maximum achievable potential" or "realistic achievable potential" as defined in 4 CSR 240-22.020(40) and 4 CSR 240-22.020(49). Instead, they cite the work plan for its upcoming market potential study (Appendix 5A Navigant_SOW_signed_01162012.pdf). While this work plan does specify the creation of scenarios that meet these savings criteria, there no guarantee that the required analysis of these additional portfolios, as specified in 4 CSR 240-22.060 and 4 CSR 420-22.070, will be performed.

In Volume 5, GMO describes one of its DSM portfolios, "DSM A", as follows:

> "DSM A" consists of a suite of twelve Energy Efficiency and two Demand Response programs that GMO considers the capacity and energy estimated from these programs comprise realistically achievable levels. (6)

This might be interpreted to meet the definition of "realistic achievable potential," but there is no analysis to show this is the case. In particular, there is no analysis to show the difference between the "maximum achievable potential" defined in 4 CSR 240-22.020(40), "DSM A" and the more aggressive portfolios analyzed in Volume 8 to meet Special Contemporary Issues C and H.

Potential Remedy

DSM portfolios meeting the definitions of "maximum achievable potential" and "realistic achievable potential" should be estimated, placed into alternative resource plans, analyzed according to the requirements of 4 CSR 240-22.060 and 4 CSR 420-22.070. This analysis should be completed as soon as practical after the completion of GMO's market potential study.

Deficiency #7. **The requirements for the 1% and 2% DSM portfolio agreed upon in Stipulation to EO-2009-0237 not been met.**

The agreed to 1% and 2% DSM portfolio agreed to in the stipulation and agreement to File No. EO-2009-0237 has not been provided.

Citation

Stipulation and Agreement, File No. EE-2009-0237, Paragraph 28.

Discussion

Paragraph 28 of the Stipulation and Agreement to File No. EO-2009-0237 reads in part:

> …GMO agrees to model and fully analyze at least one alternative DSM portfolio that annually achieves incremental electric energy and demand savings equivalent to 1% by 2015 and 2% by 2020 reductions in annual sales and peak requirements, respectively. "Fully analyze" means that the alternative portfolio(s) will be treated as resources that are available for selection in the determination of critical uncertain factors and in the identification of alternative resource plans and that at least one of the alternative portfolios will be included in an alternative resource plan that is included in the integration analysis. The demand-side resources included in these alternative portfolios will fully conform to the definition of "demand side resource" in 4 CSR 240-22.020(11). The alternative portfolio(s) will include energy efficiency programs to achieve energy

savings from end-use measure that are not included in the DSM portfolio in GMO's current preferred resource plan…

GMO analyzed an aggressive portfolio specifically designed to meet this requirement ("DSM F", see Volume 6, Page 8. The incremental energy savings in this portfolio do not meet the requirements of the stipulation.

Table 2 lists the incremental savings of the DSM F portfolio. The stipulation was highly prescriptive, establishing both desired savings levels and a schedule for attaining these savings. As can be seen in Table 2, the savings levels are not met. By 2015, DSM F achieves 0.61% of energy sales reduction, compared to the 1.00% required by the stipulation. By 2020, DSM F achieves savings of 1.18%, compared to 2.00%. The DSM F portfolio does not meet the requirements of the stipulation.

Potential Remedy

GMO should estimate a DSM portfolio specifically meeting the requirements of the Stipulation and Agreement in File No. EO-2009-0237. This portfolio should be incorporated into one or more alternative resource plans, analyzed according to the requirements of 4 CSR 240-22.060 and 4 CSR 420-22.070.

Deficiency #8. **Key metrics for the "aggressive" and "very aggressive" DSM portfolios are not provided.**

Required data on number of participants, incentive payments and administrative costs are not provided for the "aggressive" and "very aggressive" DSM portfolios.

Rule Citation

4 CSR 240-22.050(4)(G)

Table 2 Incremental Savings by GMO DSM F Portfolio

			DSM F		
YEAR	Gross Energy, Net System Input (GWh)	Gross Energy, Net System Input (MWh)	Energy (MWh) Cumulative	Energy (MWh) Incremental	Incremental Savings of Gross Energy Forecast
2012	8,746.00	8,746,000.00	81,411.81	81,411.81	0.93%
2013	8,885.00	8,885,000.00	136,024.42	54,612.61	0.61%
2014	9,042.00	9,042,000.00	194,381.04	58,356.61	0.65%
2015	**9,177.00**	**9,177,000.00**	**250,265.54**	**55,884.51**	**0.61%**
2016	9,342.00	9,342,000.00	316,411.11	66,145.56	0.71%
2017	9,460.00	9,460,000.00	401,557.98	85,146.87	0.90%
2018	9,618.00	9,618,000.00	497,123.27	95,565.29	0.99%
2019	9,787.00	9,787,000.00	603,418.62	106,295.35	1.09%
2020	**9,981.00**	**9,981,000.00**	**720,770.80**	**117,352.18**	**1.18%**
2021	10,124.00	10,124,000.00	839,802.19	119,031.39	1.18%
2022	10,296.00	10,296,000.00	960,567.40	120,765.21	1.17%
2023	10,471.00	10,471,000.00	1,083,091.90	122,524.50	1.17%
2024	10,685.00	10,685,000.00	1,207,461.54	124,369.63	1.16%
2025	10,851.00	10,851,000.00	1,333,709.39	126,247.85	1.16%
2026	11,057.00	11,057,000.00	1,461,730.13	128,020.75	1.16%
2027	11,280.00	11,280,000.00	1,591,735.16	130,005.03	1.15%
2028	11,542.00	11,542,000.00	1,723,796.92	132,061.76	1.14%
2029	11,748.00	11,748,000.00	1,857,809.03	134,012.11	1.14%
2030	11,995.00	11,995,000.00	1,993,676.46	135,867.43	1.13%
2031	12,240.00	12,240,000.00	2,131,171.13	137,494.67	1.12%
Source	Volume 1 Table 3: MPS Energy with and without DSM Impacts (GWh), Volume 1 Table 5: SJLP Energy with and without DSM Impacts (GWh)		GMO DSM Plans A F R Powell Mar 27 2012 Vol 6(4)(B)1245.xlsx		

Discussion

Rule 4 CSR 240-22.050(G) specifies the required metrics for each DSM program. These metrics include, among other things, estimates of the "incremental and cumulative number of program participants" (4 CSR 240-22.050(4)(G)(3)), estimates of the "costs of incentives paid by utility customers" (4 CSR 240-22.050(4)(G)(5).B), and estimates of "the cost to administer the potential demand-side program." (4 CSR 240-22.050(4)(G)(5).D). GMO provided this information in its workpapers ("GMO_DSM_Plan 240-22.050.xlsx") for its "DSM A" portfolio, but did not provide these metrics for its two alternative DSM portfolios, its “aggressive” portfolio (“DSM D”),its “very aggressive” portfolio (“DSM E”), or its “Stipulated” portfolio in File No. EO-2009-0237 (“DSM F”). Understanding how the higher level of savings in these alternative portfolios is achieved, whether through increasing participation by changing program incentives, or by introducing a new set of measures, is necessary to assess whether these portfolios are realistic.

GMO provided savings data for each of its DSM portfolios in its workpapers (“GMO DSM Plans A F R Powell Mar 27 2012 Vol 6(4)B1245.xlsx”) and overall expense data in response to data request MDNR-01e (“GMO DSM Plans - MIDAS Annual Expenditures DR 1e.xlsx”). But it has not provided participation data or disaggregated program costs for the “DSM D”, the “DSM E”, or the “DSM F” portfolios.

In its selection of a preferred plan, GMO rejected the two lowest cost plans, which utilized the “DSM D” portfolio, claiming that these plans were “not considered to be realistically achievable.” (Volume 7, p. 3) The background data necessary to support GMO’s decision has not been provided.

Potential Remedy

GMO should provide the program metrics described in 4 CSR 240-22.050(G) for each of its DSM portfolios.

Deficiency #9. **Savings estimates for “Aggressive”, “Very Aggressive” and “Stipulated” DSM portfolios are simple extrapolations from a common base case.**

Savings estimates of the “aggressive” (DSM D), the “very aggressive” (DSM E) and the “Stipulated” (DSM F) DSM portfolios are simple extrapolations from a common base case.

Rule Citation

4 CSR 240-22.050(6)(A)

Discussion

Cumulative energy and demand savings estimates for each GMO DSM portfolio are provided in “GMO DSM Plans A F R Powell Mar 27 2012 Vol 6(4)B1245.xlsx” in the workpapers. This workbook lists the cumulative savings by program over the 20 year planning horizon for each DSM portfolio. The worksheets for DSM portfolios “DSM D” (the “aggressive” portfolio), “DSM E” (the “very aggressive” portfolio and “DSM F” (the “Stipulated” portfolio File No. EO-2009-0237) each contain columns indicating savings derived from some unknown future technology.

For the DSM D portfolio, this column is labeled "Technology X". For the DSM E portfolio, this column is labeled "Technology Y". For the DSM F portfolio, this column is also labeled "Technology Y"[2].

Examination of these three portfolios indicates that they are based on a common level of savings and that "Technology X", "Technology Y" and "Technology Z" extrapolates the sum of the base program savings to produce the increased savings levels. "Technology X" is equal to the sum of the program-specific savings, so the savings level for the DSM D portfolio is twice the base savings. "Technology Y" is equal to three times the sum of the program-specific savings, so the savings level for the DSM E portfolio is four times the base savings. Technology Z is the incremental difference between the current year's savings and the previous year's savings times and adjustment factor. These extrapolations apply to both energy and demand savings.

This approach to estimating aggressive DSM cases, i.e., by postulating an undefined new technology that will achieve high levels of savings, was rejected by parties in GMO's 2009 IRP (File No. EE-2009-0237). In GMO's *Revised Integrated Analysis Report* (Dated October 7, 2010) contained the following:

Paragraph 33 and 42: 2% DSM Option

> In order to satisfy the targets of 1% and 2% energy efficiency, the Company will rely on Technology X to arrive at the levels of DSM required by these targets. This Technology X-enhanced option is labeled the "2% Target" and is included in the original Sibley 3 retirement alternatives.33. Staff's Deficiency 5 states: GMO did not meet the requirements of 4 CSR240-22.060(1), because GMO did not design its alternative resource plans to satisfy at least the objectives and priorities identified in 4 CSR 240-22.010(2). Specifically, the requirement of 4 CSR 240-22.010(2)(A) to consider and analyze demand-side efficiency and energy management measures on an equivalent basis with supply-side alternatives in the resource planning process is not satisfied – 4 CSR 240-22.060(1). This deficiency is resolved with GMO's agreement to work within the stakeholder process as described in Appendix 1, to expand the DSM portfolio in incremental steps to account for the development of new technologies not currently known or defined.
>
> *42. Staff's Deficiency 6 states: GMO has failed to meet the requirements of 4 CSR 240-22.070(6)(A) in that the preferred resource plan does not "strike an appropriate balance between the various planning objectives*

[2] For the following discussion, MDNR will refer to the additional savings in "DSM F" as "Technology Z".

specified in 4 CSR 240-22.010(2), more specifically 4 CSR 240-22.010(2)(A). This deficiency is resolved by GMO's agreement to work within the stakeholder process as described in Appendix 1, to expand the DSM portfolio in incremental steps to account for the development of new technologies not currently known or defined.

However in subsequent discussions with stakeholders, it was decided that the Company [would] only include alternatives that could be adopted as an executable plan. The requirement would preclude any alternative that utilized the 2% DSM target. (Emphasis Added, p.14)

MDNR cites this modeling approach as deficiency because the approach GMO used in estimating DSM D, DSM E and DSM F was specifically rejected in GMO's previous IRP filing. The insertion of such undefined technologies into an existing plan tends to preclude alternative program formulations, such as new program designs, expanded marketing efforts, or changes in the structure of customer incentives that could increase the participation and penetration of high-efficiency measures, to produce additional savings.

Potential Remedy

GMO should reconsider its program design when estimating its aggressive DSM planning cases rather than relying on "technologies not known or defined."

Deficiencies and Concerns for 4 CSR 240-22.060

Deficiency #10. **Documentation of the screening of critical uncertain factors is inadequate**

Details of the screening process of critical uncertain factors have not been provided.

Rule Citation

4 CSR 240-22.060(5), 4 CSR 240-22.060(6), and 4 CSR 240-22.060(7)

Discussion

In Volume 6, GMO conducted a screening process to determine the critical uncertain factors to be used in its risk analysis. This process included querying its subject matter experts about the risks associated with the uncertain factors listed in Table 79 (p. 151). These risks were assigned a subjective probability and assessed with CapEx to determine which risk factors would have a critical impact on GMO's costs. After its analysis GMO identified three cortical uncertain factors: load growth, natural gas prices and CO2 credit prices.

The quantitative details of this analysis were not provided in either Volume 6 or the workpapers. Specifically, GMO did not provide a quantitative description of the outcomes of the company experts' scoring, the final subjective probability, or the final probability tree. Although GMO's analysis tested for interactive effects, as specified in 4 CSR 240-22.060(6), the basic statistical model shown in Table 76 (Volume 6, p. 165) did not specify the dependent variable or describe the ranges of the variables in the model Finally, there was no discussion of the numeric outcome of the used to determine the critical uncertain factors.

Potential Remedy

Quantitative details describing the screening and selection process should be provided in either Volume 6 or in the workpapers. GMO should make this information available.

Deficiency #11. **Inadequate number of "subject matter experts" consulted in the assessment of critical uncertain factors.**

The number of "subject matter experts" consulted by GMO is inadequate to establish subjective probabilities necessary to assess critical uncertain factors.

Rule Citation

4 CSR 240-22.060(7)

Discussion

In Volume 6, GMO states:

> The Company compiled information concerning the risks listed in 22.070 (5) from subject matter experts within the company. The experts were requested to provide mid, high and low scenario forecasts for their particular risk. The mid, high and low scenarios were also assigned a subjective probability by the subject matter experts. (Volume 6, p 157)

A list of the subject matter experts consulted was not provided in the filing. GMO provided a list of subject matter experts who provided their subjective assessment of each uncertain factor in response to MDNR DR 34. This list, reproduced in Table 3 below (HC), indicates that a single GMO staff member was consulted for each uncertain factor. While these individuals are the acknowledged experts employed by GMO, relying on a single individual's opinion in a process based on a probability distribution is inadequate. A single person's opinion, regardless of his or her experience and knowledge, is inadequate to quantify a probability.

Based on Table 3, the 13 uncertain factors were assessed by 5 people. It does not appear that a sufficient number of "subject matter experts" were consulted in the assessment of uncertain factors and in the selection of factors deemed "critical." The limited number of experts consulted leads MDNR to question the validity of the analysis and selection process for critical uncertain factors described in Volume 6.

<u>Potential Remedy</u>

GMO should consult with a larger pool of experts in its analysis of uncertain factors in its next IRP filing.

Table 3: GMO staff experts ranking uncertain factors

**

[redacted]

**

Deficiency #12. **No "aggressive renewable energy resource plan."**
An alternative resource plan that utilizes only renewable energy resources has not been included in GMO's suite of plans.

Rule Citation

4 CSR 240-22.060(3)(A)2

Discussion

Rule 4 CSR 240-22.060(3)(A)2 specifies a planning case that

> Utilize only renewable energy resources, up to the maximum potential capability of renewable resources in each year of the planning horizon, if that results in more renewable energy resources than the minimally compliant plan. This constitutes the aggressive renewable energy resource plan for planning purposes;

In Volume 6, GMO presents 22 alternative resource plans based on GMO resources (See Tables 1 and 2) and 14 plans based on combined KCP&L and GMO resources (see Tables 5 and 6). Each plan features a specific DSM portfolio, a standard set of wind and solar resources, and a variety of supply-side resources. Some plans anticipate the retirement of one or more supply side resources.

GMO cites one plan, Plan ACCG6, that meets the requirements of rule 4 CSR 240-22.060(3)(A)2 (Volume 6, p. 11). This plan features 719 MW of renewable resources (700 MW of wind and 19 MW of solar). This is an increase in the standard 420 MW of renewables seen in the other plans (350 MW of wind and 19 MW of solar). Plan ACCG6 also adds three 154 MW combustion turbines, presumably to account for the planned retirement of Sibley units 1 and 2 in 2017.

The inclusion of the combustion turbines, three additional supply-side resources, suggests that Plan ACCG6 does not meet the requirements of 4 CSR 240-22.060(3)(A)2, which state clearly that the plan should "utilize only renewable energy resources."

Potential Remedy

GMO should create and analyze an alternative resource plan that meets the requirements of 4 CSR 240-22.060(3)(A)2.

Deficiency #13. **Performance measures for Combined Company Plans are not provided.**
Performance measures specified in 4 CSR 240-22.060(2) are not provided for the combined company plans.

Rule Citation

4 CSR 240-22.060(2)

Discussion

Rule 4 CSR 240-22.060(2) specifies a set of performance measures to be provided for each plan. The GMO plan estimated 14 "combined company" plans. However, Volume 6, Table 7 lists only the NPVRR values (in millions of dollars) for the combined company plans. No other performance measures, as defined in 4 CSR 240-22.0606(2), are provided in any plan volume or the workpapers provided by the Company. Without this information it is not possible to fully assess the economic impact of the various plans.

Potential Remedy

The Company should provide the required performance measures for the combined company plans.

Deficiencies and Concerns for 4 CSR 240-22.070

Concern #4. GMO did not select the lowest-cost plan as its preferred plan.

GMO's preferred plan does not have the lowest NPVRR value.

Rule Citation

4 CSR 240-22.010(2), 4 CSR 240-22.070(1)

Discussion

GMO's preferred plan (ACCG9) does not have the lowest NPVRR value, as shown in Volume 6, Table 34. In discussion of its plan selection, GMO states:

> The Preferred Plan was not the lowest cost plan from a Net Present Value of Revenue Requirement (NPVRR) perspective. There are Alternative Resource Plans that showed a lower NPVRR. These plans include DSM levels which were developed to satisfy the requirements of Special Contemporary Issue c. "a very aggressive energy efficiency resource standard" and Special Contemporary Issue h. "Analyze and document aggressive DSM portfolios without constraints" stated in Order EO-2012-0042. These levels of DSM are not considered to be realistically achievable. The plan producing the next lowest expected value of NPVRR was chosen as the Preferred Plan. (Volume 7, Page 9)

According to Volume 6, Table 32, plan ACCG9 has the fifth lowest cost plan. Four plans, plans ECCG1, DCCG1, ACCG8, and FCCG1, have lower NPVRR values. The primary features of each plan are outlined in Table 4, below.

Table 4: Comparison of GMO Low-Cost Plans

Plan	Plan Rank in terms of NPVRR	NPVRR ($MM)	DSM Portfolio	Supply Side Retirements	Retirement Date	Supply Side Additions	Date
ECCG1	1	12,220	DSM E	Retirement of Sibley Units 1 and 2	January 1, 2017	None	
DCCG1	2	12,229	DSM D	Retirement of Sibley Units 1 and 2	January 1, 2017	CT 154 MW	2030
ACCG8	3	12,434	DSM A	Retirement of Sibley Units 1 and 2	January 1, 2017	2 CC 300 MW	2024 and 2029
FCCG1	4	12,467	DSM F	Retirement of Sibley Units 1 and 2	January 1, 2017	None	
ACCG9	5	12,485	DSM A	Retirement of Sibley Units 1 and 2	January 1, 2017	CC 300 MW and CC 150 MW*	2021 and 2028
Source	Volume 6, Table 32		Volume 6, Tables 1 and 2				
* Part of 300 MW CC installation, specified in the combined plan , AJDC2							

GMO explains its selection of ACCG9 as its preferred plan on the grounds that the two lower cost plans are "not considered to be realistically achievable." Table 5 below shows the savings levels of the "DSM A", "DSM D", "DSM E" and "DSM F" portfolios as a percentage of forecast energy sales. The average savings level for DSM A is 0.49% of forecast sales per year, while the average savings for the DSM portfolio in the lowest cost plan, DSM E, is four times that of DSM A. It is the case that the savings levels for three of the four lower cost plans are at least twice that of DSM A.

A 2011 benchmarking study of utility energy efficiency found "[t]he top 10 utilities all reported achieving single-year energy savings equal to 1 percent or more of their annual electricity sales".[3] MDNR analysis of these results indicates that the average incremental savings from the 50 electric utilities cited in this study is 0.58% while the median savings is 0.45%.[4] Given these statistics, it is difficult to believe GMO's statement that higher levels of savings are not realistically achievable.

Table 5: Minimum, Maximum and Average Incremental Energy Savings as a Percentage of Gross Energy Forecast for GMO Portfolios DSM A, DSM D, DSM E and DSM F

	Incremental Energy Savings as Percent of Gross Energy Forecast				
Portfolio	Minimum	Year	Maximum	Year	Average
DSM A	0.41%	2015	0.93%	2012	0.49%
DSM D	0.81%	2015	1.86%	2012	0.98%
DSM E	1.62%	2015	3.72%	2012	1.95%
DSM F	0.61%	2013	1.18%	2020	1.02%

Sources:

Gross Energy Forecast	Volume 1 Table 3: MPS Energy with and without DSM Impacts (GWh), Volume 1 Table 5: SJLP Energy with and without DSM Impacts (GWh)
Incremental Energy Savings Values	GMO DSM Plans A F R Powell Mar 27 2012 Vol 6(4)(B)1245.xlsx

Setting differences in DSM savings aside for a moment, according to Table 4, the third lowest-cost plan, Plan ACCG8, is virtually identical to the preferred plan while having a lower NVPRR value. It has the same DSM portfolio and the same supply side retirement schedule as the preferred plan. The only difference between Plans ACCG9 and ACCG8 is with respect to the installation of supply side resources and NVPRR. Plan ACCG8 adds two 300 MW combined cycle plants in 2024 and 2029, while Plan ACCG9 adds a 300 MW combined cycle plant in 2021 and shares a 300 MW combined cycle plan with KCP&L in 2028. According to Table 4, the NVPRR difference between Plan ACCG9 and ACCG8 is $51 million. The expected financial performance measures (Volume 6, Table 77) indicate that these two plans are identical on all but one performance measure, the Capital Expenditures to Funds for Operations ("Cap Ex to FFO"). Plan ACCG8 has a lower Cap Ex to FFO ratio than Plan ACCG9, suggesting that the selection of

[3] M.J. Bradley and Associates, 2011. Benchmarking Electric Utility Energy Efficiency Portfolios in the U.S. http://www.mjbradley.com/sites/default/files/MJBA-Ceres_Benchmarking-EE-2011.pdf. Also attached as Schedule MDNR-1.

[4] See the "MJB Utility Comparison" sheet in the "MDNR EO-2012-0323 Workpapers (HC) AB.xlsx" workbook.

Plan ACCG8 would lower GMO's capital expenditures ratio. Despite the apparent advantages of plan ACCG8, it was not selected as the preferred plan.

Potential Remedy

A more complete description of the reasoning for selecting a higher-cost plan as GMO's preferred plan is required. Plan ACCG8 has a lower NVPRR than ACCG9, but apparently does not differ substantially from the preferred plan. GMO should provide a more complete explanation of why it chose plan ACCCG9 as its preferred plan, especially in light of the four other plans listed in Table 4 with lower NVPRR values.

Deficiency #14. **Questionable methodology for allocating combined plans.**

There does not appear to be any underlying methodology for allocating the resources in the combined company plans. Rather, the combined plans appear to be constructed from previously identified company-specific resources.

Rule Citation

4 CSR 240-22.010(2)(B), 4 CSR 240-22.020(7), 4 CSR 240-22.020(46), 4 CSR 240-22.070(1), 4 CSR 240-22.070(2), 4 CSR 240-22.070(4)

Discussion

GMO introduces 35 alternative resource plans in Volume 6, 21 company-specific plans and 14 "combined company" plans. The GMO plans utilize GMO supply-side and renewable resources, while the combined company plans utilize supply side and renewable resources from each Company. One notable difference between these two sets of plans is the range of DSM portfolios used in each case. The GMO plans utilize four DSM portfolios, "DSM A", "DSM D","DSM E" and "DSM F"[5], while the combined plans only utilize one DSM portfolio, a combined "DSM A". The energy and demand impacts for the combined DSM A portfolio are not analyzed in either the plan volumes or in the workpapers.

In its filing, GMO used its company-specific plans and the combined company plans for different purposes. The analysis of the company-specific plans was conducted to satisfy requirements of the Commission's Special Contemporary Issues case (EO-2012-0042), while the analysis of the combined company plans was used to select the preferred plan (see Volume 6, p. 15 for the

[5] The specifics of these plans are discussed in Deficiency 9, above.

specification of the two “lowest cost” combined plans and their GMO versions, and Volume 7, pp. 1-4 for a discussion of the GMO preferred plan).

The quantitative basis for allocating combined company resources to GMO is not discussed. The GMO plans are notable for their consistency. There are standard portfolios of DSM resources deployed, a standard level of solar installation, a standard level of wind installation, a standard set of potential retirements, and a standard set of supply side choices. The two GMO plans identified from the combined plan, ACCG9 and ACCG8, do not differ substantially from the other GMO specific plans.

For example, with the exception of plan ACCG6, which was estimated in response to a particular Special Contemporary Issue, all of the GMO specific plans (including plans ACCG9 and ACCG8) install the same amount of solar and wind resources on the same schedule. If resources were truly shared between the two companies, one might expect to see greater variety in the allocations of resources. For example, the size and schedule of wind installations would be expected to vary between the companies and not be treated as discrete company-specific blocks. Table 6 illustrates this by comparing the lowest costs combined company plan (as identified in GMO Volume 6, Table 7) with the identified preferred plan from each company’s individual filing.

By keeping resources in the combined plans discrete, the advantages of a combined plan, i.e., sharing of resources to lower operating costs, are lost. In its discussion of its combined plans, GMO does not provide any methodology for either the combination of resources or the allocation of capacity to each company. For example, Table 6 compares the resources from the preferred plans from the combined company analysis to the preferred plans from KCP&L and GMO. With one exception, the proposed installation of a 300 MW combined-cycle resource in 2028, each installed resource is allocated to each company discretely.

Table 6: Preferred plans from Combined Analysis, KCP&L and GMO plans

	Combined Plans	KCP&L Preferred Plan	GMO Preferred Plan
Resource	**Plan AJDC2**	**Plan AGEK9**	**Plan ACCG9**
DSM	**DSM A**	**DSM A**	**MEEIA DSM**
Solar	**21 MW in 2018**	**11 MW in 2018**	**10 MW in 2018**
Solar	**12 MW in 2021**	**6 MW in 2021**	**6 MW in 2021**
Solar	**6 MW in 2023**	**3 MW in 2023**	**3 MW in 2023**
Wind	**100 MW in 2016**	**100 MW in 2016**	
Wind	**150 MW in 2019**		**150MW in 2019**
Wind	**200 MW in 2020**	**200 MW in 2020**	
Wind	**100 MW in 2021**		**100 MW in 2021**
Wind	**100 MW in 2023**	**100 MW in 2023**	
Wind	**100 MW in 2024**		**100 MW in 2024**
Coal Retire	**170 MW in 2016**	**170 MW in 2016 (M1)**	
Coal Retire	**99 MW in 2017**		**99 MW in 2017 (S 1-2)**
Combined Cycle	**300 MW in 2021**		**300 MW in 2021**
Combined Cycle	**300 MW in 2028**	**150 MW in 2028**	**150MW in 2028**
Source	GMO Volume 6, Tables 5 and 6	KCP&L Volume 6, Tables 1, 2 and 3	GMO Volume 6, Tables 1 and 2

While the combined company plan selected as the preferred plan (AJDC2) is the lowest cost plan, the company specific plans selected as the preferred plans are not. In the GMO case, the preferred plan (ACCG9) is the fifth lowest cost plan in terms of NPVRR values provided in Volume 6, Table 34.

In response to MDNR DR 39, the Company describes the allocation of renewable resources, DSM resources, supply side retirements and supply side additions in terms of company need. Some of these components are specified by statute. For example, the renewable resources necessary to meet the company-specific RES requirements are merely added together in the combined plan. The DSM portfolio is artificially constrained to "DSM A" (GMO's MEEIA portfolio), which provides the same level of savings (0.5% energy savings per year) for each company. All company-specific retirements are also included in the combined plan. This leaves supply side additions as the only component of the plans that can vary. Once the preferred supply side addition was determined, adding two 300 MW combined cycle plants between 2021 and 2028, their allocation is accomplished purely on a per-company basis. The 2021 combined cycle plant is dedicated to GMO, while the 2028 combined cycle plant is evenly divided between KCP&L and GMO.

It appears that the range of outcomes and additions considered in estimation of the combined plan are overly constrained. Given these constraints, the utility of the combined planning approach is questionable. The constraints placed on the levels of renewable resources and the DSM portfolios are especially troubling. As mentioned above, each of the more aggressive DSM portfolios contained in a GMO plan produce a lower NVPRR than the preferred plan. Including a more aggressive DSM portfolio in the combined plans may produce a preferred plan with more than the savings over the stand-alone GMO preferred plan.

Potential Remedy

The Company should provide a complete description of its approach to constructing combined plans and its allocation procedures. If the Company uses a combined planning approach in the future, the combined

Deficiency #15. **Missing Analysis of Critical Uncertain Factors for GMO Preferred Plan.** GMO did not analyze the impacts of critical uncertain factors on its preferred plan.

Rule Citation

4 CSR 240-22.070(2), 4 CSR 240-22.070(4)

Discussion

4 CSR 240-22.070(2) and 4 CSR 240-22.070(4) specify the requirements of the critical uncertain factors to be used to determine when a preferred plan is no longer appropriate and a contingency plan should be considered. GMO presents the results of a contingency analysis for the combined company plan in Volume 7, pp. 9-16. This analysis considers the impact of six critical uncertain factors on the performance of the two lowest cost combined plans (AJDC2 and AGDC2):

1. CO_2 Price Uncertainty,
2. Load Growth Uncertainty,
3. Natural Gas Price Uncertainty,
4. Capital and Construction Cost Uncertainty,
5. Implementation of a Federal Energy Efficiency Standard, and
6. Loss of load

However, there is no similar analysis of GMO's preferred plan (ACCG9). The combined plans contain a combination of resources from each company. While the contingency analysis shows the impacts of each critical uncertain factor on the joint resources in AJDC2, there is no analysis showing the impacts of the critical uncertain factors on the preferred plan for GMO specifically. Given that the Company has not provided a methodology for allocating the resources in the combined plan to each individual utility, it is not possible to allocate the impacts of the critical uncertain factors.

Possible Remedy

The analysis required by 4 CSR 240-22.070(2) and 4 CSR 240-22.070(4) should be conducted for GMO plan AGEK9.

Concern #5. Federal renewable/clean energy standard as a critical uncertain factor

A potential federal renewable energy standard (RES) or clean energy standard (CES) will have significant impacts on renewable electricity generation and/or acquisition as well as associated costs. GMO's IRP plan is largely silent on a plan to address this issue.

Rule Citation

4 CSR 240-22.020(8), 4 CSR 240-22.060(5), 4 CSR 240-22.070(2)

Discussion

A number of bills have been introduced in the Congress within the past few years in order to enact a federal renewable energy standard or clean energy standard. The uncertainty of those federal policies will have more or less impacts on GMO's IRP process depending on specific provisions in those regulations. For example, Clean Energy Standard Act of 2012 (S.2146) introduced this year includes natural gas, nuclear, carbon capture and combined heat and power (CHP) in the definition of "clean energy". These potential policies will affect GMO's decision greatly on supply side resources development and acquisition. It will also affect the rankings of potential supply side resources and eventually the integrated resource planning analysis. IRP process would be further complicated since a national RES/CES will interact with other critical uncertain factors like fuel price and carbon policy. A preliminary analysis of a national RES/CES scenario is needed for a 20-year planning horizon.

Potential Remedy

GMO should investigate the impact of a federal RES and/or CES as a critical uncertain factor by modeling the scenario based on the recent legislative proposals.

Deficiencies and Concerns for 4 CSR 240-22.080

Deficiency #16. **Inadequate analysis of combined plan**

KCP&L and GMO conducted a combined planning exercise that estimated 14 combined-company plans, selected a combined preferred plan, identified contingency plans, and allocated the preferred plan back to each individual company. In completing the combined analysis, the Company neglected to meet the analysis and filing requirements described in the Chapter 22 rules.

Rule Citation

4 CSR 240-22.080(2)(C)2, 4 CSR 240-22.080(2)(D), 4 CSR 240-22.060(2)

Discussion

The filing requirements for integrated resource plans are described in 4 CSR 240-22.080(2)(C)2. This rule states: "The technical volume(s) shall be organized by chapters corresponding to 4 CSR 240-22.030-4 CSR 240-22.070." This requirement dictates that the company files a separate set of combined-company volumes to correspond to sections 4 CSR 240-22.030-4 CSR 240-22.070 of the rule. Instead, GMO dedicated parts of Volume 6 and 7 to its discussion of the combined planning effort.

Additionally, key portions of the required analysis for alternative resource plans have not been provided for the combined plans. As described in Deficiency 8 (referring to 4 CSR 240-22.060(2)), key performance measures for the combined plans have not been provided in either Volume 6 or the workpapers. The required capacity balance tables for the combined plans (as required by 4 CSR 240-22.080(2)(D)) have been omitted.

Potential Remedy

The filing, analytical and reporting requirements of the rule are clear. GMO should present a revised combined plan that meets requirements of the Chapter 22 rules.

Deficiency #17. **GMO requests acknowledgement of the combined company methodology rather than a preferred plan or resource acquisition strategy.**

GMO is requesting acknowledgement of its decision to analyze its alternative resource plans on a "combined company" basis.

Rule Citation

4 CSR 240-22.080(17)

Discussion

Rule 4 CSR 240-22.080(17) states that

> If the commission finds that the filing achieves substantial compliance with the requirements outlined in (16), the commission may acknowledge the utility's preferred resource plan or resource acquisition strategy as reasonable at a specific date. The commission may acknowledge the preferred resource plan or resource acquisition strategy in whole, in part, with exceptions, or not at all.

The scope of commission "acknowledgement" is clearly limited to "the utility's preferred resource plan or resource acquisition strategy."

In Volume 8, p. 24, GMO makes the following request:

> GMO requests Commission acknowledgement that it is reasonable for *GMO and KCP&L to perform resource planning on a joint company basis as evidenced by the significant savings to retail customers from such planning*. The results of resource analysis assuming a combined-company basis is that GMO benefitted by +$140 Million on a 20-year NPVRR basis in savings in comparison to the plan that would be selected for GMO on a stand-alone basis. This savings is due to GMO being able to delay building new capacity by seven years and the opportunity to share with KCP&L a smaller portion of a new combined cycle facility that would be built in 2021 under a combined-company scenario. (Emphasis added)

In making its acknowledgement request, GMO is asking the Commission to acknowledge its use of combined company planning approach in this plan and in the allocation methods used to create a GMO-specific preferred plan from its combined planning effort.

MDNR maintains that GMO's request for acknowledgement is not appropriate. GMO is not requesting acknowledgement of its preferred plan or its resource acquisition strategy. Rather, GMO is asking for acknowledgement of its methodology for conducting a combined company analysis. As highlighted in Deficiency 14 above, GMO has not described the methodology it used to allocate resources to the different companies. Instead, the combined company plans are simple combinations of discrete resources from each company. The overall revenue requirement for the combined plans is then calculated and the individual resources are allocated back to its original companies. There is no evidence of extensive resource sharing between the companies, and no detailed examination of the true savings that could occur by sharing resources.

The combined company plans are remarkable for including a single DSM portfolio, one based on each company's original MEEIA filings (in EO-2012-0008 and EO-2012-0009), rather than testing the other "very aggressive" ("DSM D") and "extremely aggressive" ("DSM E") portfolios that are common to both company's plans.

Once the two lowest-cost plans were identified, GMO relied on these plans for its contingency analysis, completely ignoring the circumstances that could cause GMO to adopt a different resource acquisition strategy independent of the actions of KCP&L.

These comments suggest that GMO plans have not met the Commission's threshold for acknowledgement, and that acknowledgement of GMO's planning methodology is not appropriate. It appears that GMO conducted a combined analysis without consulting the stakeholders or asking the Commission for appropriate waiver, and is seeking to use the acknowledgement provisions in the rule to request endorsement of its planning decisions after the fact.

Potential Remedy

GMO should comply with the rules as it conducts its plans and use the waiver process to justify major deviations from the standards for integrated resource planning, as specified in the Chapter 22 rules.

Special Contemporary Issues

Deficiency #18. **Special Contemporary Issue B: Energy savings requirements for Special Contemporary Issue B have not been met.**

The requirements for Special Contemporary Issue B have not been met.

Citation

Special Contemporary Issue B File No. EO-2012-0042.

Discussion

Special Contemporary Issue B File No.EO-2012-0042 states:

> Investigate and document the impacts on GMO's preferred resource plan and contingency plans of a new much more aggressive renewable energy standard (e.g., at least double the current standard for Missouri) with no rate cap;

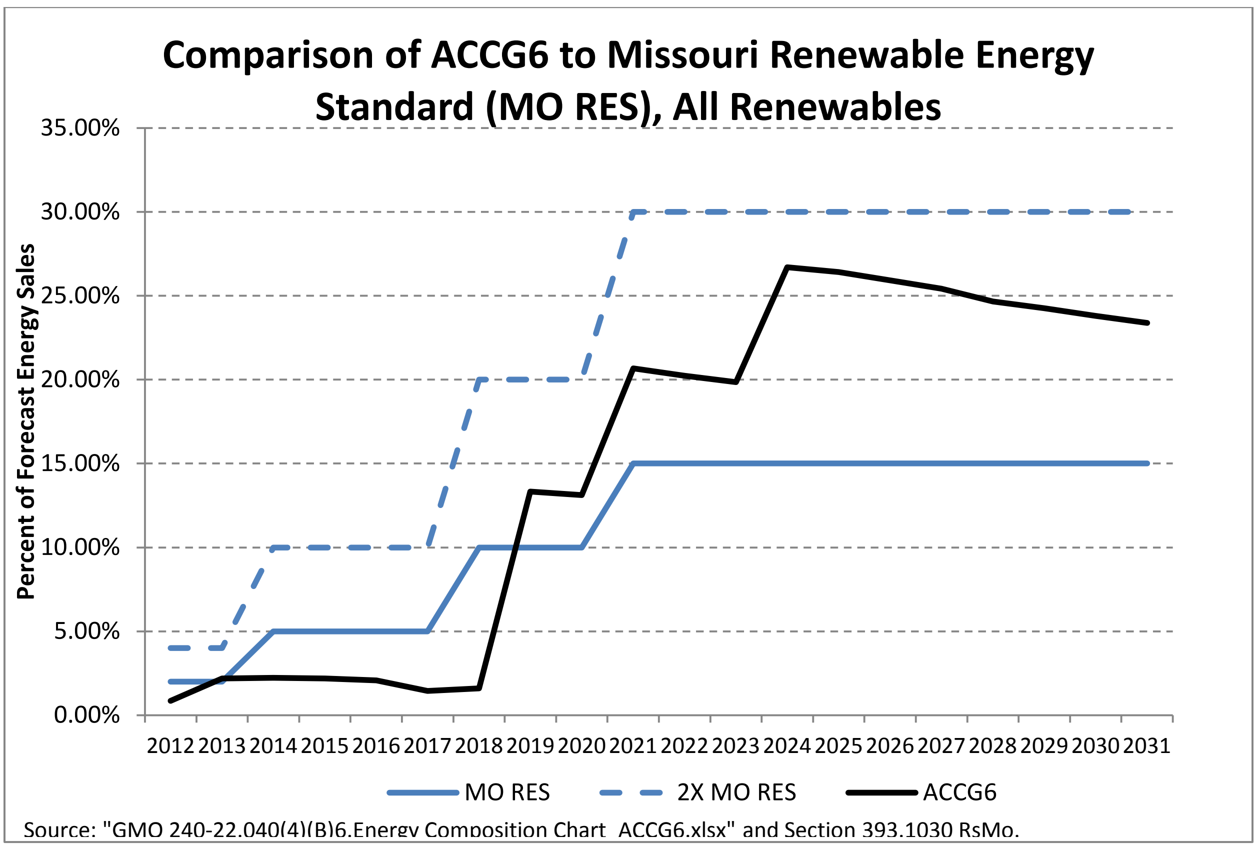
In Volume 8, GMO states "Alternative Resource Plan ACCG6 complies with this section." (Volume 8, p. 10). Analysis of the "Adjusted GWh" values (defined as "Wtd_GenGWh" in the energy composition workpapers) of the renewable energy resources (Wind and Solar) for plan ACCG6 (as presented in workpaper "GMO 240-22.040(4)(B)6.Energy Composition

Chart_ACCG6.xlsx") shows that the renewable energy resources never meet or exceed the performance levels specified in Special Contemporary Issue B ("at least double the current standard for Missouri", see Figure 1). This is despite the planned installation of 700 MW of wind resources between 2019 and 2024, a doubling of the wind resources installed in the other GMO plans (see Volume 6, Tables 1-2). While Volume 6, Table 1 indicates a doubling of wind capacity in plan ACCG66, relative to the other GMO plans, the energy produced by the additional capacity does not meet the standard specified in Special Contemporary Issue B.

Potential Remedy

The analysis for Special Contemporary Issue B should be repeated using a renewable portfolio that meets the requirements of the issue.

Figure 1: Comparison of ACCG6 to Missouri Renewable Energy Standard (MO RES), All Renewables



Concern #6. Special Contemporary Issue H: Response to Special Contemporary Issue H does not address the "demand-side investment mechanisms necessary to implement" an aggressive DSM portfolio.

The response to Special Contemporary Issue H does not analyze or document the demand-side investment mechanisms necessary to implement an aggressive DSM portfolio.

<u>Citation</u>

Special Contemporary Issue H File No. EO-2012-0042.

<u>Discussion</u>

Special Contemporary Issue H File No.EO-2012-0042 states:

> Analyze and document aggressive DSM portfolios without constraints. Include analysis and documentation of demand-side investment mechanisms necessary to implement each DSM portfolio.

In Volume 8, GMO states "Alternative Resource Plan DCCG1 complies with this section. The necessary demand-side investment mechanism is described in case number EO-2012-0009 for Kansas City Power & Light's Greater Missouri Operations." (Volume 8, p. 12).

<u>Discussion</u>

While the DSM portions of plans of plan DCCG1 (i.e., DSM Portfolio D) is more aggressive than the proposed MEEIA portfolio (DSM Portfolio A), no discussion of the Demand Side Investment Mechanism (DSIM) GMO would have to receive to implement aggressive DSM savings is provided in its current plan. The materials cited, the DSIM provisions for GMO's MEEIA case (from EO-2012-0009), do not anticipate the additional payments and incentives necessary to implement a more aggressive DSM portfolio. There is no consideration of the additional program costs, incentive values, throughput disincentive recovery or program designs necessary to implement a more aggressive DSM portfolio.

<u>Potential Remedy</u>

An analysis showing the structure of a DSIM sufficiently robust to allow the implementation of GMO DSM Portfolio H should be conducted and provided in GMO's annual update.

Deficiency #19. **Special Contemporary Issues I and J: GMO has not analyzed distributed generation, DSM programs, and combined heat and power projects in collaboration with municipalities and in the agricultural sector.**

GMO has not conducted any analysis of program targeted to the municipal or agricultural sectors.

<u>Citation</u>

Special Contemporary Issues I and J, File No. EO-2012-0042.

<u>Discussion</u>

Special Contemporary Issue I File No.EO-2012-0042 states:

> Analyze and document the impacts of opportunities to implement distributed generation, DSM programs, and combined heat and power projects in collaboration with municipal water treatment plants and other local waste or agricultural/industrial processes with on-site electrical and thermal load requirements, especially in targeted areas where there may be transmission or distribution line constraints.

Special Contemporary Issue J File No.EO-2012-0041 states:

> Analyze and document analysis of DSM programs targeted to achieve energy efficiency savings in the agricultural sector.

GMO did not present any analysis of the opportunities available in the agricultural or municipal sectors. In response to these two issues, GMO cites its potential study statement of work in both Volume 5 and in its reply to MDNR DR 32.

In its reply to MDNR DR 32, GMO states: "However, GMO plans to file the results of this DSM Study in its required annual IRP update. T*he annual update will include an analysis and documentation and programs, if appropriate, to achieve energy savings in the agricultural sector.*" (Emphasis added) However, these sectors are not addressed specifically as focus areas for the potential study analysis (see Appendix 5A Navigant_SOW_signed_01162012.pdf). There is no indication that GMO has done anything to consider opportunities in these two sectors.

<u>Potential Remedy</u>

An analysis of the opportunities and challenges of working in the agricultural and municipal sectors should be provided.

Deficiency #20. **Special Contemporary Issue L: The Environmental Impact of Plan ACCG6 has not been analyzed; the requirements of Special Contemporary Issue L have not been met.**

The requirements of Special Contemporary Issue L have not been met.

<u>Citation</u>

Special Contemporary Issue L, File No. EO-2012-0042.

<u>Discussion</u>

Special Contemporary Issue L File No.EO-2012-0042 states:

> Analyze potential or proposed changes in state or federal environmental or renewable energy standards and report how those changes would affect GMO's plans for compliance with those standards.

In Volume 8, GMO states "Alternative Resource Plan ACCG6 complies with this section." (Volume 8, p. 14). Plan ACCG6 provides a more aggressive renewable portfolio than the standard renewable portfolio (see the discussion of Deficiency 11 above). However, GMO offers no discussion of how the implementation of this plan will impact GMO's plans for compliance with environmental standards.

<u>Potential Remedy</u>

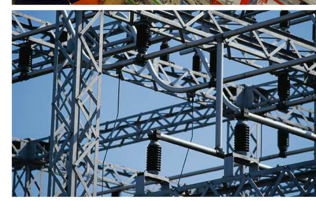
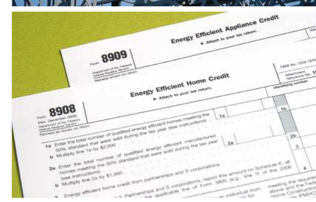
The analysis for Special Contemporary Issue L should be repeated using a renewable portfolio that meets the requirements the issue.

Schedule MDNR-1: M.J. Bradley and Associates, 2011. Benchmarking Electric Utility Energy Efficiency Portfolios in the U.S.

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

M.J. Bradley & Associates, LLC

November 2011



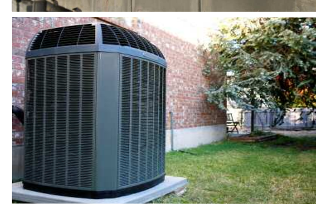


Table of Contents

Acknowledgements

This report was funded by a grant from the Energy Foundation.
We would like to acknowledge and thank the following people who made this report possible.

REPORT AUTHORS

Brian Jones, MJB&A (M.J. Bradley & Associates, LLC)
Lily Hoffman-Andrews, MJB&A
Isaac Liberman, MJB&A
Lea Reynolds, MJB&A
Austin Whitman, MJB&A

REPORT REVIEWERS AND CONTRIBUTORS

David Wooley, Energy Foundation
Dan Mullen, Ceres
Dan Bakal, Ceres
Devra Wang, NRDC
Ralph Cavanagh, NRDC
Dan York, ACEEE
Derek Murrow, ENE (Environment Northeast)
Sam Krasnow, ENE
Steven Schiller, Schiller Consulting
Chris James, RAP
Niko Dietsch, US EPA
Joe Bryson, US EPA
Jeff Brown, US EPA

Report photo images are from PhotoDisc and iStock.

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:

MJB&A
47 Junction Square Drive
Concord, MA 01742
Telephone: (978) 369-5533

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.

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.

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.

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]

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.

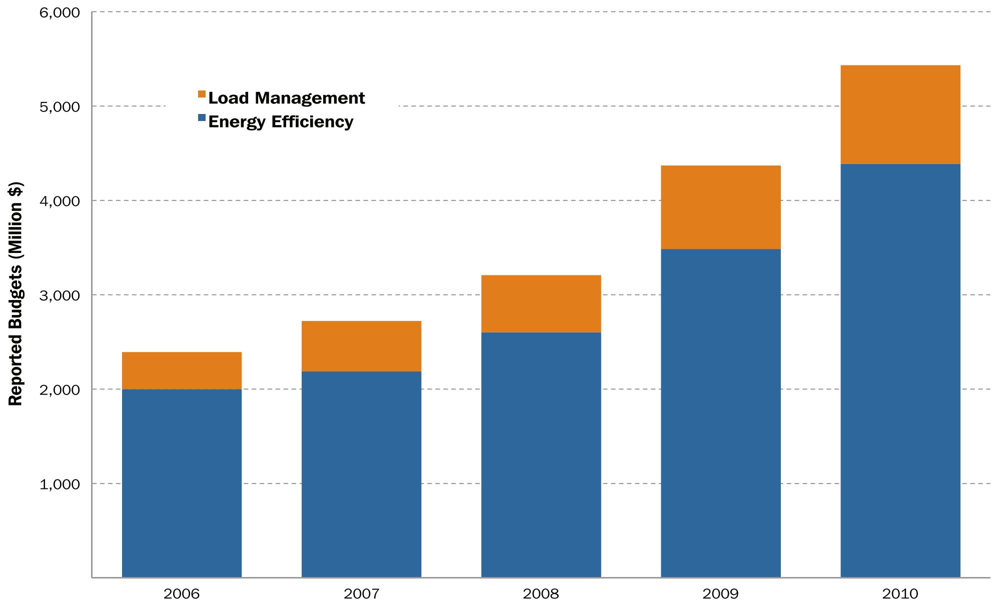
In its widely-cited market survey, McKinsey & Company estimates that total 2008 efficiency market spending was on the order of $10 to $12 billion: $2.5 billion through utility programs, $3.5 billion through Energy Service Companies (ESCOs), and $4 to $6 billion on "insulation and devices."[4] This excludes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

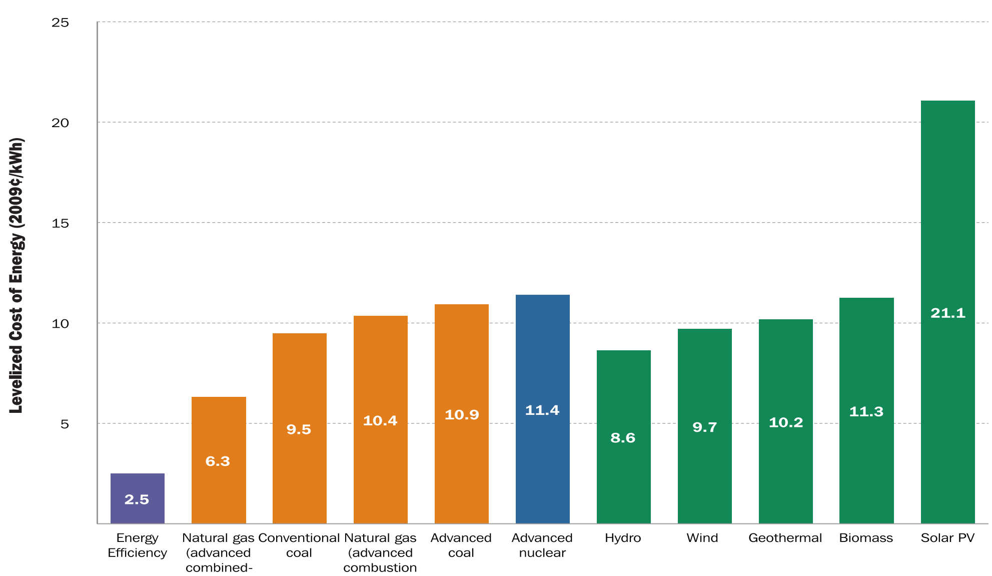
Figure 1: Growth of Reported Energy Efficiency Budgets (2006—2010)



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)

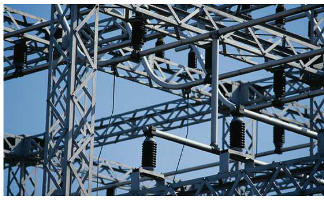


Source: EIA Annual Energy Outlook 2011 and ACEEE

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.

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.

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.

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.

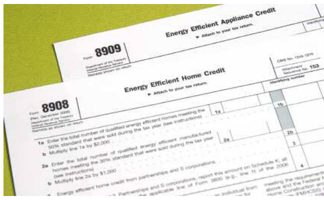
In the future, robust benchmarking of efficiency programs should aim to fill the current void and create a comprehensive comparison of efficiency programs to support greater stakeholder involvement.

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]

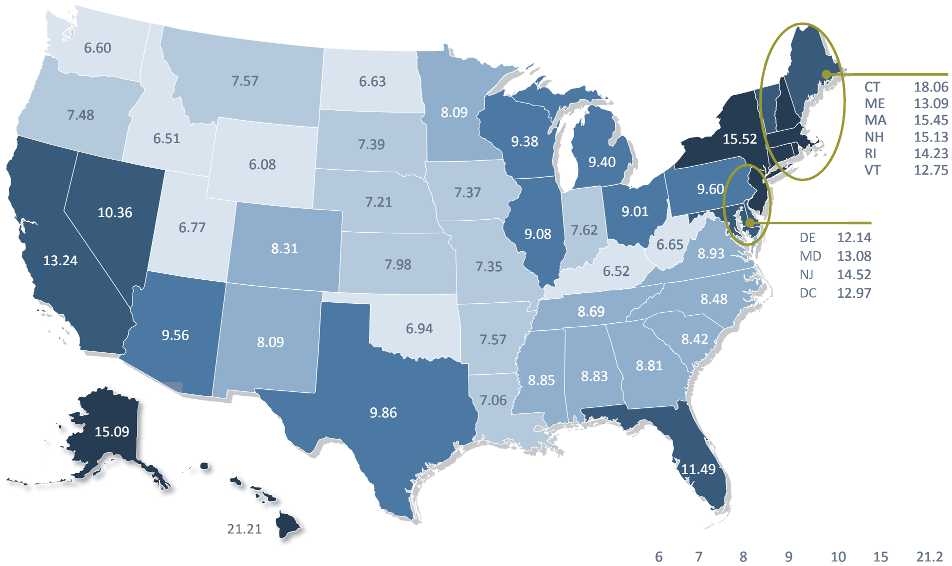
Customer Composition

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.

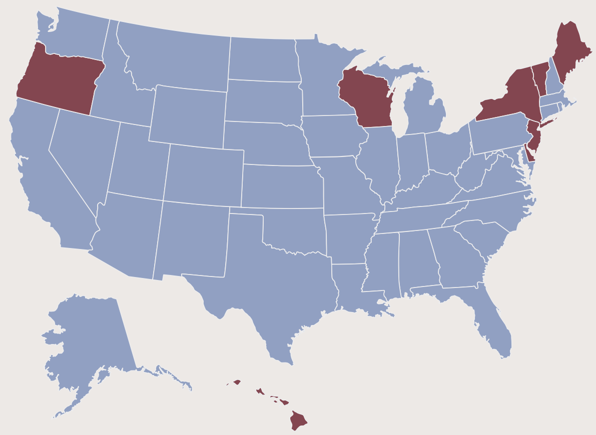
The utilities that resulted from this selection process are listed in ***Table 1,*** and ***Figure 4*** (pages 19 and 20) displays the service territories of these utilities.

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.

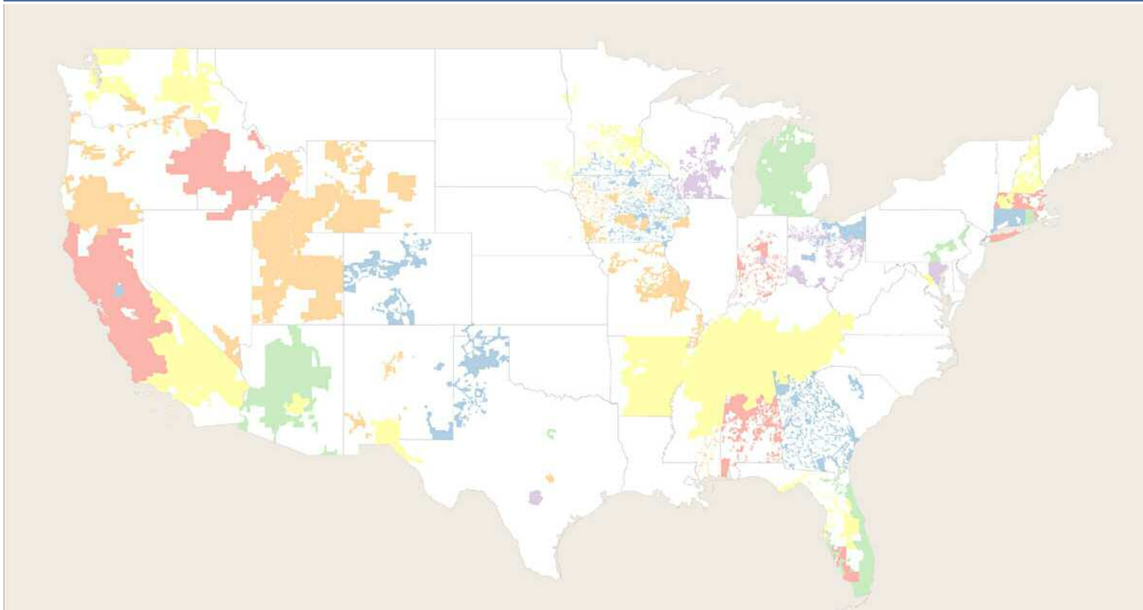
Delaware—Energy efficiency programs in the state are operated by the Delaware Sustainable Energy Utility, as well as by utilities. The Sustainable Energy Utility is a nonprofit under contract with the Delaware Energy Office, and its programs are funded by federal stimulus grants, sales of renewable energy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

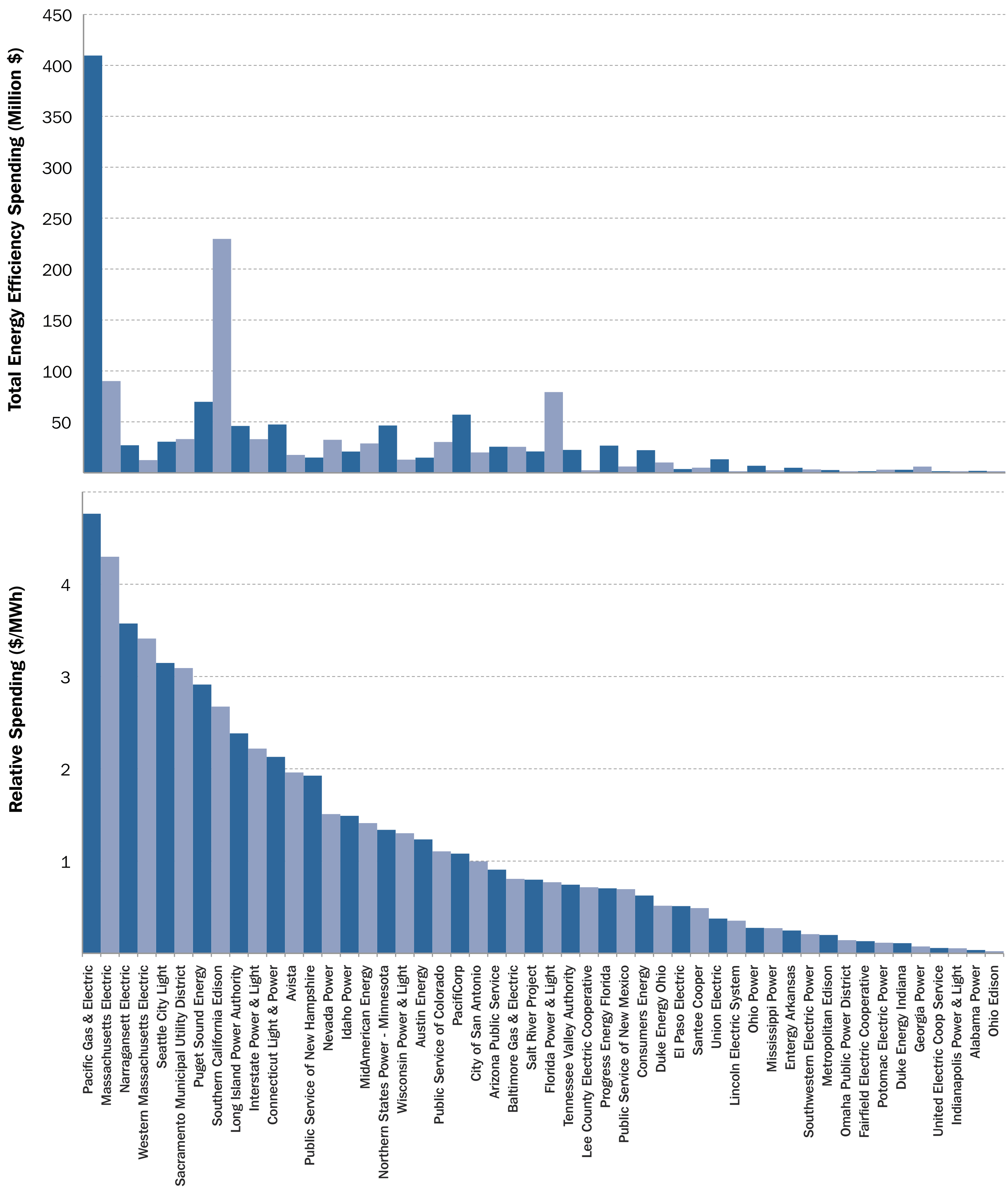
Table 2 and ***Figure 6*** compare the 2009 energy efficiency programs of the selected utilities on these spending metrics.

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:

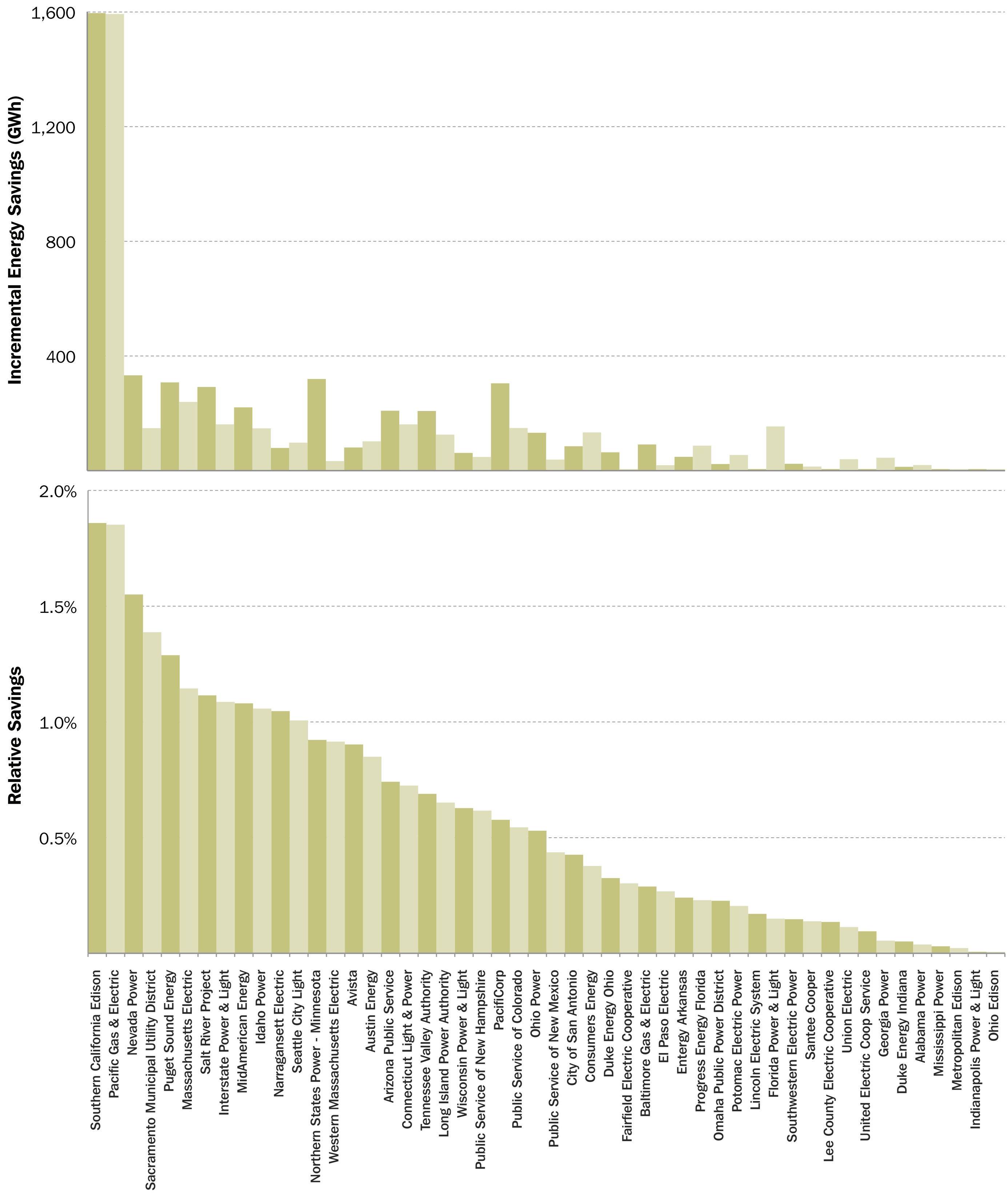
- Savings achieved by energy efficiency programs (incremental savings); and
- Incremental savings as a percent of retail electric sales (relative savings).

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

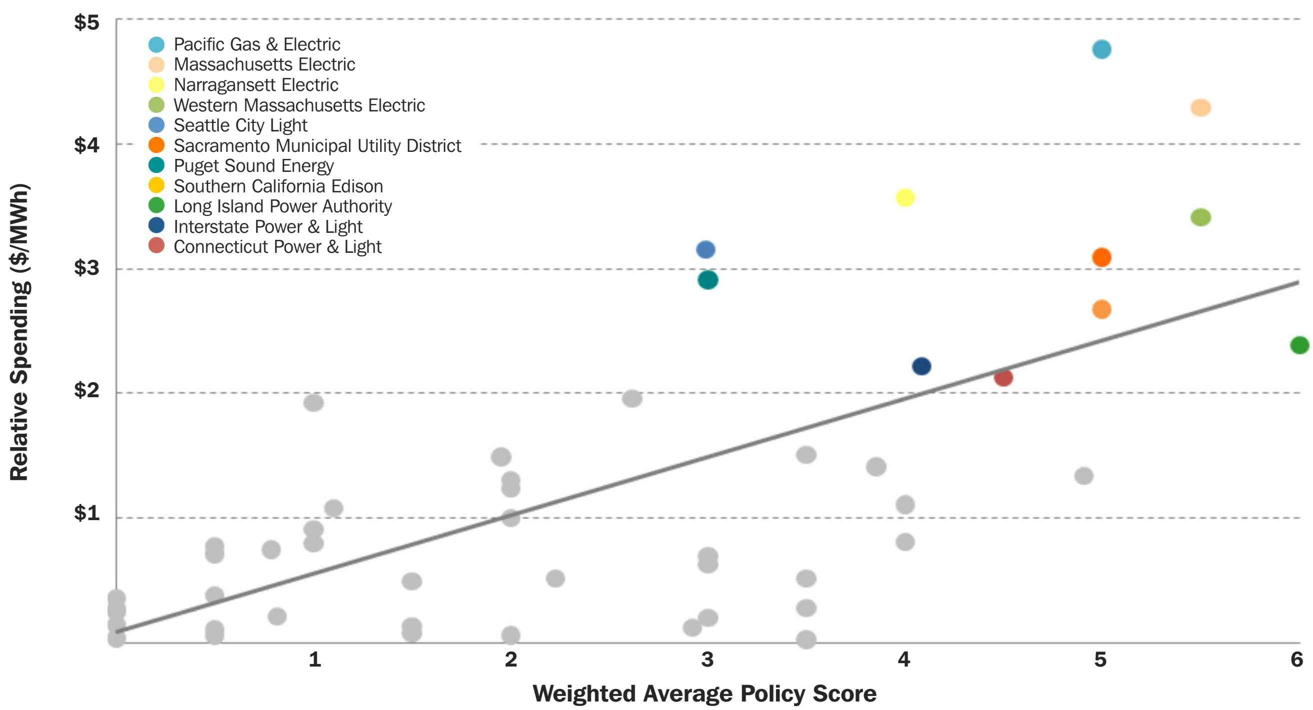
* LRR—Alternative lost revenue recovery mechanism in place rather than decoupling.
^ First Resource—Requirement for energy efficiency to serve as the first priority resource in utility planning.
Source: American Council for an Energy-Efficient Economy, "The 2009 State Energy Efficiency Scorecard." October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

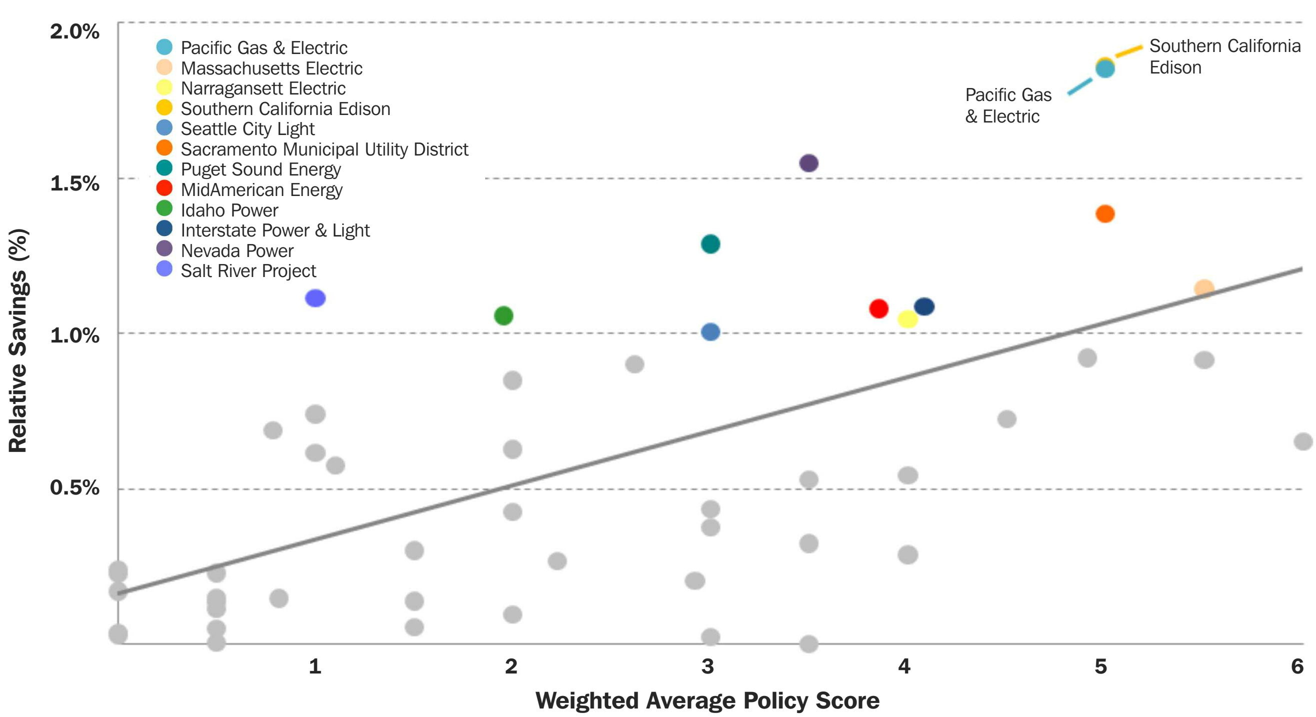
Utility	Parent Company/Common Name	Ownership Type	Census Region	Weighted Policy Score	Relative Spending ($/MWh)	Relative Savings (%)
Long Island Power Authority	Long Island Power Authority	State	Northeast	6.0	$2.38	0.65%
Massachusetts Electric	National Grid	Investor Owned	Northeast	5.5	$4.30	1.14%
Western 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]

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.

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

1 For more information on energy efficiency policies see www.epa.gov/eeactionplan and http://www1.eere.energy.gov/seeaction/

2 Caracino J, Nevius M, Fesler L. *The State of the Efficiency Program Industry: 2009 Expenditures, Impacts & 2010 Budgets.* Consortium for Energy Efficiency, December 10, 2010. http://www.cee1.org/ee-pe/2010AIR.php3.

3 David Roland-Horst (2008), *Energy Efficiency, Innovation, and Job Creation in California*

4 McKinsey & Company. 2009, *Unlocking Energy Efficiency in the U.S. Economy.* http://www.mckinsey.com/en/Client_Service/Electric_Power_and_Natural_Gas/Latest_thinking/Unlocking_energy_efficiency_in_the_US_economy.aspx

5 McKinsey & Company. 2009, *Unlocking Energy Efficiency in the U.S. Economy.* http://www.mckinsey.com/en/Client_Service/Electric_Power_and_Natural_Gas/Latest_thinking/Unlocking_energy_efficiency_in_the_US_economy.aspx

6 American Council for an Energy Efficient Economy (ACEEE). *2010 State Energy Efficiency Scorecard.* Research Report E107. October 13, 2010. http://www.aceee.org/research-report/e107

7 Barbose G, Goldman C, Schlegel J. 2009. *The Shifting Landscape of Ratepayer-Funded Energy Efficiency in the U.S.* Lawrence Berkeley National Laboratory report LBNL-2258E, October 2009.

8 Caracino J, Nevius M, Fesler L. *The State of the Efficiency Program Industry: 2009 Expenditures, Impacts & 2010 Budgets.* Consortium for Energy Efficiency, December 10, 2010. http://www.cee1.org/ee-pe/2010AIR.php3.

9 Energy Information Administration. 2009. *Annual Electric Utility Data 2009 (Form EIA-861).* http://www.eia.doe.gov/cneaf/electricity/page/eia861.html

10 Energy Information Administration. 2009. *Annual Electric Generator Report 2009 (Form EIA-860).* http://www.eia.doe.gov/cneaf/electricity/page/eia860.html

11 Capital costs for new generating capacity were estimated using data from the National Renewable Energy Laboratory: http://www.nrel.gov/analysis/costs.html

12 Friedrich K, Eldridge M, York D, Witte P, and Kushler M. *Saving Energy Cost-Effectively: A National Review of the Cost of Energy Saved through Utility-Sector Energy Efficiency Programs.* ACEEE Research Report U092, September 2009. http://www.aceee.org/research-report/u092

13 Energy Information Administration. 2011. Levelized Cost of New Generation Resources in the Annual Energy Outlook 2011. http://www.eia.gov/oiaf/aeo/pdf/2016levelized_costs_aeo2011.pdf

14 Schiller S, Goldman C, Galawish E. *National Energy Efficiency Evaluation, Measurement, and Verification (EM&V) Standard: Scoping Study of Issues and Implementation Requirements.* April 2011. Lawrence Berkeley National Laboratory Report LBNL-4265E. April 2011. http://eetd.lbl.gov/ea/emp/reports/lbnl-4265e.pdf

15 For more information on the RTF see http://www.nwcouncil.org/energy/rtf/Default.htm

16 For more information on the NEEP EM&V Forum see http://www.neep.org/emv-forum

17 For more information on NAESB see http://www.naesb.org/dsm-ee.asp

18 For more information on SEE Action see http://www1.eere.energy.gov/seeaction/evaluation.html

19 American Council for an Energy Efficiency Economy (ACEEE). *Carrots for Utilities: Providing Financial Returns for Utility Investments in Energy Efficiency.* ACEEE Research Report U111. January 24, 2011. http://www.aceee.org/research-report/u111

20 American Council for an Energy Efficiency Economy (ACEEE). *State Energy Efficiency Resource Standard (EERS) Fact Sheet: Updated December 2010.* ACEEE Fact Sheet. December 20, 2010. http://www.aceee.org/fact-sheet/state-energy-efficiency-resource-standard-eers-fact-sheet-u

21 Institute for Electric Efficiency, *Integrating Codes and Standards into Electric Utility Energy Efficiency Portfolios*, IEE Whitepaper August 2011. http://www.edisonfoundation.net/iee/reports/IEE_IntegratingC&SintoEEPortfolios_final.pdf

22 CEE, 2010. Figure is the sum of Efficiency Maine, Efficiency Vermont, Energy Trust of Oregon, Focus on Energy (Wisconsin), Hawaii Energy Efficiency Program, NJ Clean Energy Program, Northwest Energy Efficiency Alliance, NYSERDA, Public Interest Energy Research of Energy Services.

23 Barbose G, Goldman C, and Schlegel J. 2009. *The Shifting Landscape of Ratepayer-Funded Energy Efficiency in the U.S.* Lawrence Berkeley National Laboratory Report, October 2009. http://eetd.lbl.gov/ea/ems/reports/lbnl-2258e.pdf.

24 Tennessee Valley Authority. 2011. Integrated Resource Plan, Appendix C—Energy Efficiency and Demand Response. http://www.tva.gov/environment/reports/irp/pdf/Final_IRP_complete.pdf

25 http://dis.puc.state.oh.us/TiffToPDf/A1001001A11C16B01033E02752.pdf

26 http://dis.puc.state.oh.us/TiffToPDf/A1001001A11C15B62659C48525.pdf

27 FirstEnergy Ohio. 2011. Report of the Status of 2010 Energy Efficiency and Peak Demand Reduction Benchmarks. http://dis.puc.state.oh.us/DocumentRecord.aspx?DocID=88b2f213-51e0-4d11-a14f-7f6d42ee614c

28 Metropolitan Edison. 2011. Annual Report to the Pennsylvania Public Utility Commission (Program Year 2). http://www.puc.state.pa.us//pcdocs/1140182.pdf

29 PacifiCorp. http://www.pacificorp.com/content/dam/pacificorp/doc/Energy_Sources/Integrated_Resource_Plan/2011IRP/2011IRP-MainDocFinal_Vol1-FINAL.pdf

30 Southwest Energy Efficiency Project. Wyoming, Utility Energy Efficiency Programs. http://www.swenergy.org/programs/utilities/wyoming.htm

31 Southwest Energy Efficiency Project. Colorado, Utility Energy Efficiency Programs. http://www.swenergy.org/programs/utilities/colorado.htm

32 Lawrence Berkeley National Laboratory. Energy Efficiency in Western Utility Resource Plans: Impacts on Regional Resource Assessment and Support for WGA Policies. August 2006. http://eetd.lbl.gov/ea/ems/reports/58271.pdf

33 California Public Utilities Commission. Amended Application Of Pacific Gas And Electric Company For Approval Of The 2009-2011 Energy Efficiency Programs And Budget. March 2, 2009. https://www.pge.com/regulation/EnergyEfficiency2009-2011-Portfolio/Pleadings/PGE/2009/EnergyEfficiency2009-2011-Portfolio_Plea_PGE_20090302-01.pdf

34 Portland General Electric, Issues in Perspective: Integrated Resource Plan. November 2009. http://www.portlandgeneral.com/our_company/news_issues/current_issues/docs/ip_irp.pdf

35 Nevada Public Utility Commission. Docket No. 10-10024. Application of Nevada Power Company d/b/a NV Energy to establish interim base energy efficiency program rates and base energy efficiency implementation rates pursuant to NRS 704.785 and the Order issued in Docket No. 09-07016. June 29, 2011, and Robison, Jennifer. "NV Energy Wins Rate Increase." *Las Vegas Review Journal.* May 24, 2011. http://www.lvrj.com/business/nv-energy-wins-rate-increase-122460789.html

36 Draft Resolution Of The Board Of Directors Of The Salt River Project Agricultural Improvement And Power District Regarding Revisions To Sustainable Portfolio Principles. May 23, 2011. http://www.srpnet.com/environment/earthwise/pdfx/spp/May23/FinalDraftResolution.pdf

37 Energy Information Administration, 2009. *Annual Electric Utility Data 2009 (Form EIA-861).* http://www.eia.doe.gov/cneaf/electricity/page/eia861.html.

38 Michael Reid. 2009. "Using U.S. Energy Information Administration Data to Benchmark Electric Utility DSM Portfolios." Paper presented at the 2009 International Energy Efficiency Program Evaluation Conference, June 2009, Portland, OR. http://www.iepec.org/2009PapersTOC/papers/036.pdf#page=1

39 American Council for an Energy Efficiency Economy (ACEEE). *Where Have All the Data Gone? The Crisis of Missing Energy Efficiency Data.* Research Report E101. February 1, 2010. http://www.aceee.org/research-report/e101

40 US EPA, *Quantifying Emission Impacts of Clean Energy Initiatives*, http://epatechforum.org/documents/2010-2011/2010-2011.html

41 See 2009 ACEEE report for CSE formula: http://www.aceee.org/research-report/u092